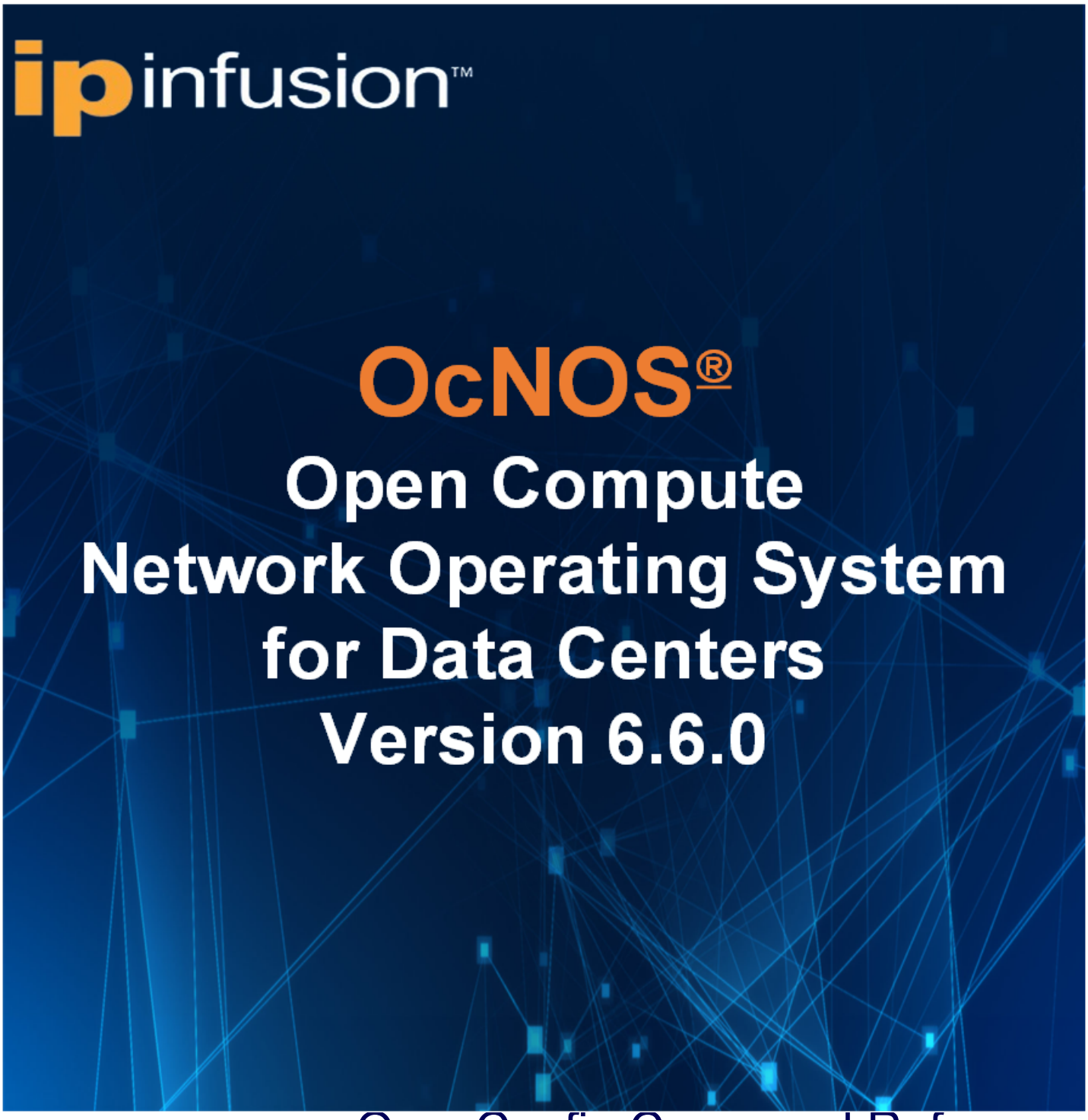

OpenConfig Command Reference

February 2025

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Preface

This guide describes how to configure OcNOS.

IP Maestro Support

Monitor devices running OcNOS Release 6.3.4-70 and above using IP Maestro software.

Audience

This guide is intended for network administrators and other engineering professionals who configure OcNOS.

Conventions

Table 1 on page 25 shows the conventions used in this guide.

Table 1: Conventions

Convention	Description
Italics	Emphasized terms; titles of books
Note:	Special instructions, suggestions, or warnings
`monospaced type`	Code elements such as commands, parameters, files, and directories

Chapter Organization

The chapters in command references are organized as described in Command Description Format.

The chapters in configuration guides are organized into these major sections:

- An overview that explains a configuration in words
- Topology with a diagram that shows the devices and connections used in the configuration
- Configuration steps in a table for each device where the left-hand side shows the commands you enter and the right-hand side explains the actions that the commands perform
- Validation which shows commands and their output that verify the configuration

Related Documentation

For information about installing OcNOS, see the *Installation Guide* for your platform.

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Feature Availability

The features described in this document that are available depend upon the OcNOS SKU that you purchased. See the *Feature Matrix* for a description of the OcNOS SKUs.

Migration Guide

Check the *Migration Guide* for configuration changes to make when migrating from one version of OcNOS to another.

Support

For support-related questions, contact support@ipinfusion.com.

Comments

If you have comments, or need to report a problem with the content, contact techpubs@ipinfusion.com.

Command Line Interface

This chapter introduces the OcNOS Command Line Interface (CLI) and how to use its features.

Overview

You use the CLI to configure, monitor, and maintain OcNOS devices. The CLI is text-based and each command is usually associated with a specific task.

You can give the commands described in this manual locally from the console of a device running OcNOS or remotely from a terminal emulator such as `putty` or `xterm`. You can also use the commands in scripts to automate configuration tasks.

Command Line Interface Help

You access the CLI help by entering a full or partial command string and a question mark “?”. The CLI displays the command keywords or parameters along with a short description. For example, at the CLI command prompt, type:

```
> show ?
```

The CLI displays this keyword list with short descriptions for each keyword:

```
show ?
  application-priority            Application Priority
  arp                             Internet Protocol (IP)
  bfd                             Bidirectional Forwarding Detection (BFD)
  bgp                             Border Gateway Protocol (BGP)
  bi-lsp                          Bi-directional lsp status and configuration
  bridge                          Bridge group commands
  ce-vlan                         COS Preservation for Customer Edge VLAN
  class-map                       Class map entry
  cli                             Show CLI tree of current mode
  clns                            Connectionless-Mode Network Service (CLNS)
  control-adjacency               Control Adjacency status and configuration
  control-channel                 Control Channel status and configuration
  cspf                            CSPF Information
  customer                        Display Customer spanning-tree
  cvlan                           Display CVLAN information
  debugging                       Debugging functions
  etherchannel                    LACP etherchannel
  ethernet                        Layer-2
...
```

If you type the ? in the middle of a keyword, the CLI displays help for that keyword only.

```
> show de?
debugging  Debugging functions
```

If you type the ? in the middle of a keyword, but the incomplete keyword matches several other keywords, OcNOS displays help for all matching keywords.

```
> show i? (CLI does not display the question mark).
interface  Interface status and configuration
ip         IP information
isis       ISIS information
```

Command Completion

The CLI can complete the spelling of a command or a parameter. Begin typing the command or parameter and then press the tab key. For example, at the CLI command prompt type `sh`:

```
> sh
```

Press the tab key. The CLI displays:

```
> show
```

If the spelling of a command or parameter is ambiguous, the CLI displays the choices that match the abbreviation. Type `show i` and press the tab key. The CLI displays:

```
> show i
  interface  ip          ipv6       isis
> show i
```

The CLI displays the `interface` and `ip` keywords. Type `n` to select `interface` and press the tab key. The CLI displays:

```
> show in
> show interface
```

Type ? and the CLI displays the list of parameters for the `show interface` command.

```
> show interface
  IFNAME  Interface name
  |       Output modifiers
  >       Output redirection
  <cr>
```

The CLI displays the only parameter associated with this command, the `IFNAME` parameter.

Command Abbreviations

The CLI accepts abbreviations that uniquely identify a keyword in commands. For example:

```
> sh int xe0
```

is an abbreviation for:

```
> show interface xe0
```

Command Line Errors

Any unknown spelling causes the CLI to display the error `Unrecognized command` in response to the ?. The CLI displays the command again as last entered.

```
> show dd?
% Unrecognized command
> show dd
```

When you press the Enter key after typing an invalid command, the CLI displays:

```
(config)#router ospf here
                        ^
% Invalid input detected at '^' marker.
```

where the ^ points to the first character in error in the command.

If a command is incomplete, the CLI displays the following message:

```
> show
% Incomplete command.
```

Some commands are too long for the display line and can wrap mid-parameter or mid-keyword, as shown below. This does *not* cause an error and the command performs as expected:

```
area 10.10.0.18 virtual-link 10.10.0.19 authent
ication-key 57393
```

Command Negation

Many commands have a `no` form that resets a feature to its default value or disables the feature. For example:

- The `ip address` command assigns an IPv4 address to an interface
- The `no ip address` command removes an IPv4 address from an interface

Syntax Conventions

Table 2 on page 29 describes the conventions used to represent command syntax in this reference.

Table 2: Syntax conventions

Convention	Description	Example
`monospaced font`	Command strings entered on a command line	`show ip ospf`
`lowercase`	Keywords that you enter exactly as shown in the command syntax.	`show ip ospf`
`UPPERCASE`	See Variable Placeholders	`IFNAME`
`()`	Optional parameters, from which you must select one. Vertical bars delimit the selections. Do not enter the parentheses or vertical bars as part of the command.	`(A.B.C.D|<0-4294967295>)`
`()`	Optional parameters, from which you select one or none. Vertical bars delimit the selections. Do not enter the parentheses or vertical bars as part of the command.	`(A.B.C.D|<0-4294967295>|)`
`()`	Optional parameter which you can specify or omit. Do not enter the parentheses or vertical bar as part of the command.	`(IFNAME|)`
`{}`	Optional parameters, from which you must select one or more. Vertical bars delimit the selections. Do not enter the braces or vertical bars as part of the command.	`{intra-area <1-255>|inter-area <1-255>|external <1-255>}`

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Table 2: Syntax conventions (Continued)

Convention	Description	Example
`[]`	Optional parameters, from which you select zero or more. Vertical bars delimit the selections. Do not enter the brackets or vertical bars as part of the command.	`[<1-65535>|AA:NN|internet|local-AS|no-advertise|no-export]`
`?`	Nonrepeatable parameter. The parameter that follows a question mark can only appear once in a command string. Do not enter the question mark as part of the command.	`?route-map WORD`
`.`	Repeatable parameter. The parameter that follows a period can be repeated more than once. Do not enter the period as part of the command.	`set as-path prepend .<1-65535>`

Variable Placeholders

Table 3 on page 30 shows the tokens used in command syntax use to represent variables for which you supply a value.

Table 3: Variable placeholders

Token	Description
`WORD`	A contiguous text string (excluding spaces)
`LINE`	A text string, including spaces; no other parameters can follow this parameter
`IFNAME`	Interface name whose format varies depending on the platform; examples are: `eth0`, `Ethernet0`, `ethernet0`, `xe0`
`A.B.C.D`	IPv4 address
`A.B.C.D/M`	IPv4 address and mask/prefix
`X:X::X:X`	IPv6 address
`X:X::X:X/M`	IPv6 address and mask/prefix
`HH:MM:SS`	Time format
`AA:NN`	BGP community value
`XX:XX:XX:XX:XX:XX`	MAC address

`<1-5>`
`<1-65535>`
`<0-2147483647>`
`<0-4294967295>`
	Numeric range

Command Description Format

Table 4 on page 31 explains the sections used to describe each command in this reference.

Table 4: Command descriptions

Section	Description
Command Name	The name of the command, followed by what the command does and when should it be used
Command Syntax	The syntax of the command
Parameters	Parameters and options for the command
Default	The state before the command is executed
Command Mode	The mode in which the command runs; see Command Modes
Example	An example of the command being executed

Keyboard Operations

Table 5 on page 31 lists the operations you can perform from the keyboard.

Table 5: Keyboard operations

Key combination	Operation
Left arrow or Ctrl+b	Moves one character to the left. When a command extends beyond a single line, you can press left arrow or Ctrl+b repeatedly to scroll toward the beginning of the line, or you can press Ctrl+a to go directly to the beginning of the line.
Right arrow or Ctrl-f	Moves one character to the right. When a command extends beyond a single line, you can press right arrow or Ctrl+f repeatedly to scroll toward the end of the line, or you can press Ctrl+e to go directly to the end of the line.
Esc, b	Moves back one word
Esc, f	Moves forward one word
Ctrl+e	Moves to end of the line
Ctrl+a	Moves to the beginning of the line
Ctrl+u	Deletes the line
Ctrl+w	Deletes from the cursor to the previous whitespace
Alt+d	Deletes the current word
Ctrl+k	Deletes from the cursor to the end of line
Ctrl+y	Pastes text previously deleted with Ctrl+k, Alt+d, Ctrl+w, or Ctrl+u at the cursor

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Table 5: Keyboard operations (Continued)

Key combination	Operation
Ctrl+t	Transposes the current character with the previous character
Ctrl+c	Ignores the current line and redisplays the command prompt
Ctrl+z	Ends configuration mode and returns to exec mode
Ctrl+l	Clears the screen
Up Arrow or Ctrl+p	Scroll backward through command history
Down Arrow or Ctrl+n	Scroll forward through command history

Show Command Modifiers

You can use two tokens to modify the output of a `show` command. Enter a question mark to display these tokens:

```
# show users ?
  | Output modifiers
  > Output redirection
```

You can type the | (vertical bar character) to use output modifiers. For example:

```
> show rsvp | ?
  begin     Begin with the line that matches
  exclude   Exclude lines that match
  include   Include lines that match
  last      Last few lines
  redirect  Redirect output
```

Begin Modifier

The `begin` modifier displays the output beginning with the first line that contains the input string (everything typed after the `begin` keyword). For example:

```
# show running-config | begin xe1
...skipping
interface xe1
 ipv6 address fe80::204:75ff:fee6:5393/64
!
interface xe2
 ipv6 address fe80::20d:56ff:fe96:725a/64
!
line con 0
 login
!
end
```

You can specify a regular expression after the `begin` keyword, This example begins the output at a line with either “xe2” or “xe4”:

```
# show running-config | begin xe[2-4]

...skipping
```

```
interface xe2
 shutdown
!
interface xe4
 shutdown
!
interface svlan0.1
 no shutdown
!
route-map myroute permit 2
!
route-map mymap1 permit 10
!
route-map rmap1 permit 2
!
line con 0
 login
line vty 0 4
 login
!
end
```

Include Modifier

The `include` modifier includes only those lines of output that contain the input string. In the output below, all lines containing the word “input” are included:

```
# show interface xe1 | include input
    input packets 80434552, bytes 2147483647, dropped 0, multicast packets 0
    input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 1, missed 0
```

You can specify a regular expression after the `include` keyword. This examples includes all lines with “input” or “output”:

```
#show interface xe0 | include (in|out)put
    input packets 597058, bytes 338081476, dropped 0, multicast packets 0
    input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 0, missed 0
    output packets 613147, bytes 126055987, dropped 0
    output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0
```

Exclude Modifier

The `exclude` modifier excludes all lines of output that contain the input string. In the following output example, all lines containing the word “input” are excluded:

```
# show interface xe1 | exclude input
Interface xe1
  Scope: both
  Hardware is Ethernet, address is 0004.75e6.5393
  index 3 metric 1 mtu 1500 <UP,BROADCAST,RUNNING,MULTICAST>
  VRF Binding: Not bound
  Administrative Group(s): None
  DSTE Bandwidth Constraint Mode is MAM
  inet6 fe80::204:75ff:fee6:5393/64
    output packets 4438, bytes 394940, dropped 0
    output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0
    collisions 0
```

You can specify a regular expression after the `exclude` keyword. This example excludes lines with “output” or “input”:

```
# show interface xe0 | exclude (in|out)put
Interface xe0
  Scope: both
  Hardware is Ethernet  Current HW addr: 001b.2139.6c4a
  Physical:001b.2139.6c4a  Logical:(not set)
  index 2 metric 1 mtu 1500 duplex-full arp ageing timeout 3000
  <UP,BROADCAST,RUNNING,MULTICAST>
  VRF Binding: Not bound
  Bandwidth 100m
  DHCP client is disabled.
  inet 10.1.2.173/24 broadcast 10.1.2.255
  VRRP Master of :  VRRP is not configured on this interface.
  inet6 fe80::21b:21ff:fe39:6c4a/64
    collisions 0
```

Redirect Modifier

The `redirect` modifier writes the output into a file. The output is not displayed.

```
# show cli history | redirect /var/frame.txt
```

The output redirection token (>) does the same thing:

```
# show cli history >/var/frame.txt
```

Last Modifier

The `last` modifier displays the output of last few number of lines (As per the user input). The last number ranges from 1 to 9999.

For example:

```
#show running-config | last 10
```

String Parameters

The restrictions in Table 6 on page 35 apply for all string parameters used in OcNOS commands, unless some other restrictions are noted for a particular command.

Table 6: String parameter restrictions

Restriction	Description
Input length	1965 characters or less
Restricted special characters	“?”, “,”, “>”, “|”, and “=” The “|” character is allowed only for the `description` command in interface mode.

Command Modes

Commands are grouped into modes arranged in a hierarchy. Each mode has its own set of commands. Table P-7 lists the command modes common to all protocols.

Table 7: Common command modes

Name	Description
Executive mode	Also called *view* mode, this is the first mode to appear after you start the CLI. It is a base mode from where you can perform basic commands such as `show`, `exit`, `quit`, `help`, and `enable`.
Privileged executive mode	Also called *enable* mode, in this mode you can run additional basic commands such as `debug`, `write`, and `show`.
Configure mode	Also called *configure terminal* mode, in this mode you can run configuration commands and go into other modes such as interface, router, route map, key chain, and address family. Configure mode is single user. Only one user at a time can be in configure mode.
Interface mode	In this mode you can configure protocol-specific settings for a particular interface. Any setting you configure in this mode overrides a setting configured in router mode.
Router mode	This mode is used to configure router-specific settings for a protocol such as BGP or OSPF.

Command Mode Tree

The diagram below shows the common command mode hierarchy.

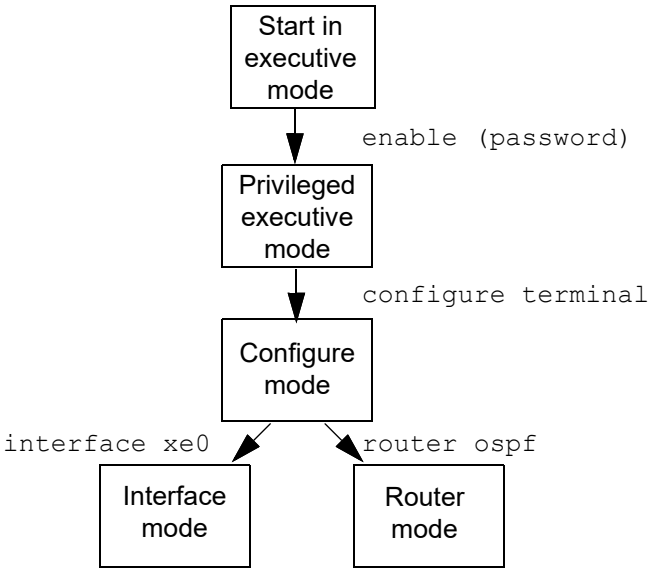


Figure P-1: Common command modes

To change modes:

1. Enter privileged executive mode by entering `enable` in Executive mode.
2. Enter configure mode by entering `configure terminal` in Privileged Executive mode.

The example below shows moving from executive mode to privileged executive mode to configure mode and finally to router mode:

```
> enable mypassword
# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
(config)# router ospf
(config-router)#
```

Note: Each protocol can have modes in addition to the common command modes. See the command reference for the respective protocol for details.

Transaction-based Command-line Interface

The OcNOS command line interface is transaction based:

- Any changes done in configure mode are stored in a separate *candidate* configuration that you can view with the `show transaction current` command.
- When a configuration is complete, apply the candidate configuration to the running configuration with the `commit` command.
- If a `commit` fails, no configuration is applied as the entire transaction is considered failed. You can continue to change the candidate configuration and then retry the `commit`.
- Discard the candidate configuration with the `abort transaction` command.
- Check the last aborted transaction with the `show transaction last-aborted` command.
- Multiple configurations cannot be removed with a single `commit` . You must remove each configuration followed by a `commit`

Note: All commands MUST be executed only in the default CML shell (`cmlsh`). If you log in as root and start `imish`, then the system configurations will go out of sync. The `imish` shell is not supported and should not be started manually.

Introduction

Overview

OpenConfig Translation feature is designed to enable NETCONF clients to interact with OcNOS (a network operating system) using standardized YANG models, particularly OpenConfig. This feature involves translating data between OpenConfig and OcNOS data models, primarily for `edit-config`, `get-config`, `get`, and `notification operations`. A Translation Framework has been developed to facilitate these translations.

Feature Characteristics

It is primarily designed to work with OpenConfig 2.0.0 and uses the latest models available at the time of implementation.

The feature targets network operators who wish to manage their multi-vendor network using a standardized interface, reducing operational costs and complexity.

Benefits

The OpenConfig Translation benefits are listed below:

Standardization: Allows network operators to manage OcNOS products using standardized YANG models, promoting consistency and simplifying network management.

Multi-Vendor Support: Facilitates the management of multi-vendor networks through a unified interface.

Flexibility: Supports the translation of both OpenConfig and OcNOS data models, offering flexibility to network administrators.

Error Reporting: Enables error reporting using OpenConfig paths, enhancing troubleshooting and diagnostics.

Prerequisites

Here are the prerequisites for OpenConfig Translation:

- The feature depends on using OpenConfig or OcNOS data models in the NETCONF client.
- The OcNOS NetConf server needs to be restarted and configured with translation enabled.
- The translation is based on OpenConfig release 2.0.0.

Troubleshooting

- Error reporting is done using OpenConfig paths; unknown or unsupported leafs are ignored.
- The translation may lead to the rejection of configuration if unsupported parts are encountered.
- Ensure that the correct data models are used, and translations are properly configured.

Limitations

- Certain operations such as "`replace`" and "`create`" might not be supported on all nodes.
- Not all network configurations may be visible through NetConf if they are not supported by the translation.
- Support for RPCs and notifications in OpenConfig models are not supported.
- To handle data with OpenConfig namespaces, the translation must be enabled in advance as enabling OpenConfig translation and editing objects within the OpenConfig namespace in the same transaction is not supported.
  - If the translation is not enabled in advance, the payload will be rejected as the current NETCONF session cannot process OpenConfig namespaces, resulting in an `unknown namespace` error.

OpenConfig Configurations

This document describes the OpenConfig configurations and state attributes supported by OcNOS SP and Optical Transport Network (OTN) versions 6.6.0 and the limitations which apply to some of the paths.

Network-instance Object Values for “type” Attribute

There are several protocols that are configured inside the Network-Instance object, and the distinguishing factor is the value of the `/network-instances/network-instance/config/type` attribute. For some protocols is also needed to configure leaf `/network-instances/network-instance/ encapsulation/config/ encapsulation-type`.

The below table displays all the values used on current translated protocols:

OcNOS Network Instance (NI) type `xpath: /network-instances/network-instance/ instance-type`	**Open Config NI type** `xpath: /network-instances/network-instance/ config/type`
vrf	L3VRF || DEFAULT_INSTANCE
mac-vrf	L2L3 + leaf `/network-instances/network-instance/ encapsulation/config/encapsulation-type` as “MPLS”
l2ni (bridge)	L2L3
vpls	L2VSI + leaf `/network-instances/network-instance/ encapsulation/config/encapsulation-type` as “MPLS”
vpws	L2P2P + leaf `/network-instances/network-instance/ encapsulation/config/encapsulation-type` as “MPLS”
evpn	L2L3 + leaf `/network-instances/network-instance/ encapsulation/config/encapsulation-type` as “VXLAN”

OcNOS Network Instance (NI) type `xpath: /network-instances/network-instance/instance-type`	**Open Config NI type** `xpath: /network-instances/network-instance/config/type`
cross-connect	L2P2P
bridge-domain	L2VSI

Network-instance restrictions

When deleting a network-instance element via NETCONF, if there are interfaces associated with that instance, a NETCONF `get` of the candidate datastore still presents the network-instance and interface association. It is removed after a `commit` operation and then represented correctly on both candidate and running datastore.

Yang deviation and NETCONF Client Yangcli

OcNOS utilizes the Yang deviation statements to indicate that the datamodel supported deviates from the OpenConfig models.

The NETCONF Client Yangcli does not support Yang deviations and should not be used for managing OpenConfig namespace. Note that using NETCONF Yangcli client with OpenConfig may lead to operation errors.

Enable OpenConfig Translation

The OpenConfig feature is disabled by default and must be enabled using the following CLI command on the OcNOS shell.

```
OcNOS> enable
OcNOS# configure terminal
OcNOS(config)# netconf translation openconfig
OcNOS(config)# commit
OcNOS#^D
OcNOS#show running-config netconf translation
!
netconf translation openconfig
!
```

Or using the equivalent NETCONF

```
<netconf-server xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-management-server">
  <netconf-translation>
    <config>
      <translation-mode>openconfig</translation-mode>
    </config>
  </netconf-translation>
</netconf-server>
```

The translation is disabled using the following CLI command on the OcNOS shell:

```
OcNOS> enable
OcNOS# configure terminal
OcNOS(config)# no netconf translation
OcNOS(config)# commit
OcNOS#^D
OcNOS#show running-config netconf translation
OcNOS#
```

To get the OpenConfig data, the corresponding namespace must be given:

```
yangcli ocnos@localhost>  sget-config /netconf-server source=running
<rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
  <data>
    <netconf-server xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
management-server">
      <netconf-translation>
        <config>
          <translation-mode>openconfig</translation-mode>
        </config>
        <state>
          <translation-mode>openconfig</translation-mode>
        </state>
      </netconf-translation>
    </netconf-server>
  </data>
</rpc-reply>
```

Restrictions

Enabling OpenConfig translation and editing objects within the OpenConfig namespace in the same transaction is not supported. To handle data with OpenConfig namespaces, the translation must be enabled in advance. Otherwise, the payload gets rejected, as the current NETCONF session cannot process OpenConfig namespaces, and results in `unknown namespace` error.

OpenConfig Optical-Channel and Terminal Device

Overview

This document describes the OpenConfig configurations for Optical-Channel and Terminal Device and states the attributes supported by OcNOS versions 5.0 and 5.1 and the limitations which apply for some of the paths.

This section used to be dedicated to Optical Transport Network (OTN), but with additional OpenZR/ZR+ support in OcNOS release 6.5.0, this section applies to all platforms which support similar optical features.

Enable OpenConfig Translation

The OpenConfig feature is disabled by default and must be enabled using the following CLI command on the OcNOS shell.

```
OcNOS#cml netconf translation (disable|openconfig)
```

Or using the equivalent NETCONF RPC:

```
<netconf-translation xmlns="http://ipinfusion.com/ns/zebmcli">
    <status>disable|openconfig</status>
</netconf-translation>
```

Once enabled, the user is still able to get data in OcNOS format by specifying the required namespace:

```
yangcli ocnos@localhost>  sget-config /ipi-interface:interfaces source=running
```

This generates the following RPC:

```
<get-config xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
  <source>
    <running/>
  </source>
  <filter type="subtree">
    <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface"/>
  </filter>
</get-config>
```

To get OpenConfig data, the corresponding namespace must be given:

```
yangcli ocnos@localhost>  sget-config /oc-if:interfaces source=running

<get-config xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
  <source>
    <running/>
  </source>
  <filter type="subtree">
    <interfaces xmlns="http://openconfig.net/yang/interfaces"/>
  </filter>
</get-config>
```

If OpenConfig is enabled and no filter is provided, all the supported OpenConfig models are retrieved in OpenConfig format. The OcNOS models for which no translation is supported will be retrieved in OcNOS format.

Enable Coherent modules

It is mandatory to enable the module previously for all other configurations.

Configuration

This XML configuration snippet is used to enable coherent modules (slot 6 and slot 3).

OpenConfig Netconf Payload:

Here is a sample OpenConfig NetConf Payload to enable coherent modules.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
<name>SLOT-6</name>
<linecard xmlns="http://openconfig.net/yang/platform/linecard">
      <config>
        <power-admin-state>oc-platform-types:POWER_ENABLED</power-admin-state>
      </config>
</linecard>
  </component>
  <component>
<name>SLOT-3</name>
<linecard xmlns="http://openconfig.net/yang/platform/linecard">
      <config>
        <power-admin-state>oc-platform-types:POWER_ENABLED</power-admin-state>
      </config>
</linecard>
  </component>
</components>
```

OcNOS CLI Command

The below CLI command is used to enable coherent modules.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#coherent-module 6
OcNOS(config-module)#enable
OcNOS(config-module)#commit
```

OcNOS Netconf Payload

Here is a sample OcNOS NetConf Payload to enable coherent modules.

```
<terminal-device xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform-
terminal-device">
  <coherent-module>
    <slot-index>3</slot-index>
    <config>
      <slot-index>3</slot-index>
      <service-enable/>
    </config>
  </coherent-module>
      <coherent-module>
    <slot-index>6</slot-index>
    <config>
```

```
      <slot-index>6</slot-index>
      <service-enable/>
    </config>
  </coherent-module>
</terminal-device>
```

Validation

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below:

```
<filter >
<components xmlns="http://openconfig.net/yang/platform">
<component>
<name>SLOT-6</name>
<linecard xmlns="http://openconfig.net/yang/platform/linecard">
<state>
</state>
</linecard>
</component>
</components>
</filter>
```

Get OpenConfig Return

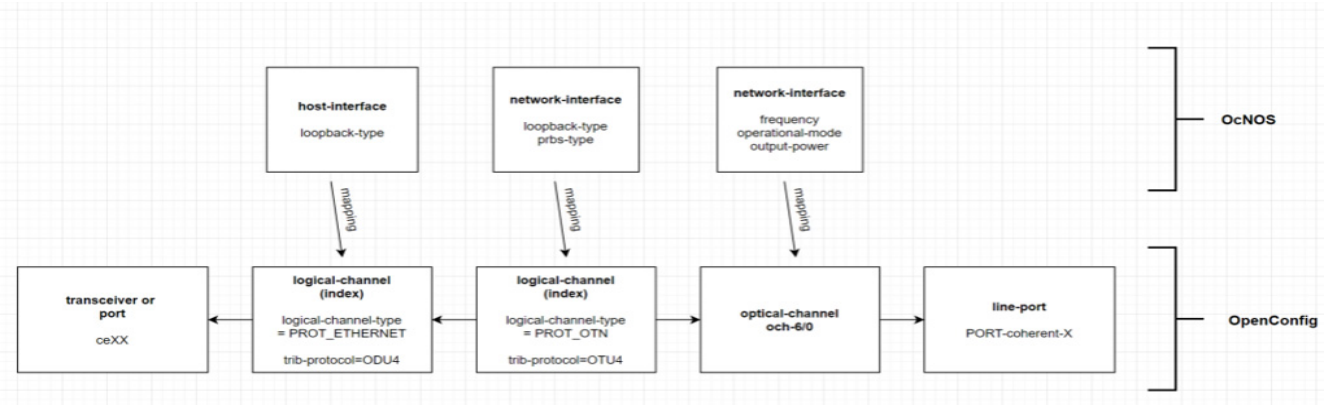
This validation response provides information on the configuration and runtime for enabling coherent modules.

```
      <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>SLOT-6</name>
      <linecard xmlns="http://openconfig.net/yang/platform/linecard">
        <state>
          <power-admin-state>POWER_ENABLED</power-admin-state>
          <slot-id>6</slot-id>
        </state>
      </linecard>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <name>SLOT-6</name>
        <equipment-failure xmlns="http://openconfig.net/yang/alarms">false</
equipment-failure>
        <temperature>
          <alarm-status>false</alarm-status>
        </temperature>
        <id>SLOT-6</id>
        <parent>CHASSIS</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:ACTIVE</oper-status>
        <removable>true</removable>
        <part-no>TRB200DAA-01</part-no>
        <serial-no>VCD19330008</serial-no>
        <software-version>NA</software-version>
        <firmware-version>1.5</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>LUMENTUM</mfg-name>
```

```
        <location>6</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:LINECARD</type>
      </state>
      <subcomponents xmlns="http://openconfig.net/yang/platform">
        <subcomponent>
          <name>PORT-coherent-6</name>
          <state>
            <name>PORT-coherent-6</name>
          </state>
        </subcomponent>
        <subcomponent>
          <name>PORT-ce27</name>
          <state>
            <name>PORT-ce27</name>
          </state>
        </subcomponent>
        <subcomponent>
          <name>PORT-ce28</name>
          <state>
            <name>PORT-ce28</name>
          </state>
        </subcomponent>
      </subcomponents>
    </component>
  </components>
```

Host Interface, Network Interface, and Logical Channels

Host interface Loopback-type and Network interface prbs-type are translated to logical channels. The correlation is shown in the image below:



Optical-channel

The optical channel contains the following:

- frequency
- operational mode
- output-power

The network interface is translated to an Optical channel and has the same value as a coherent module slot. (i.e. slot 6/ network interface 0→ och-6/0).

Logical-Channel

The logical channel contains the following:

- loopback-type
- prbs-type

The network interface is translated to logical channels. The index is represented by a 8 digits hexa number, where:

- 2 digits for slot
- 2 digits for network interface
- 2 digits for host interface

To avoid ambiguity, 1 is added to the desired interface.

For example:

Slot 6, host-interface 1 is represented by 0x060002. In OpenConfig, this number is translated to decimal 393218.

Slot 4, network-interface 0 is represented by 0x040100. In OpenConfig, this number is translated to decimal 262400.

Optical-channel and Logical-channel behavior on OcNOS

Both optical-channel and logical-channel are mapped to `/terminal-device/coherent-module/network-interfaces/network-interface` on OcNOS. Hence, some specific information about configuration and unconfiguration are necessary.

Here is the mapping:

OcNOS XPATH	**OpenConfig XPATH**
/terminal-device/coherent-module/network-interfaces/interface/config/frequency	/components/component[name=OCH-X/Y]/**optical-channel**/config/frequency
/terminal-device/coherent-module/network-interfaces/interface/config/operational-mode	/components/component[name=OCH-X/Y]/**optical-channel**/config/operational-mode
/terminal-device/coherent-module/network-interfaces/interface/config/target-output-power	/components/component[name=OCH-X/Y]/**optical-channel**/config/target-output-power
/terminal-device/coherent-module/network-interfaces/interface/config/soft-tx-disable	/terminal-device/l**ogical-channels**/channel[index]/config/admin-state
/terminal-device/coherent-module/network-interfaces/interface/config/loopback-type	/terminal-device/**logical-channels**/channel[index]/config/loopback-mode

When the user creates optical-channel or logical-channel for the first time, it already creates the structure of `/terminal-device/coherent-module/network-interfaces/interface/`.

When the user wants to delete the entire component OCH or logical-channels/channel, it tries to delete `/terminal-device/coherent-module/network-interfaces/interface/`. So it is important to delete only one of them.

It is recommended to delete network-interfaces through component OCH.

Here are some examples:

```
<component operation="delete">
<name>OCH-1/0</name>
```

```
<channel operation=”delete”>
<index>393218</index>
```

To delete the network-interfaces/interface in OcNOS, there is a restriction that it must be empty and not have any configuration under it. So, if the user wants to delete on that level, the other configurations must be deleted one by one.

Loopback-type on Host Interface

This configuration is used to configure loopback type on the host interface.

The two possible values are: FACILITY (shallow in Netconf mode) and TERMINAL (deep in Netconf mode).

Configuration

Configure slot 6, Host-interface 1 loopback -type to shallow.

OpenConfig Netconf Payload

Here is a sample OpenConfig NetConf Payload to configure loopback type on host interface.

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
  <logical-channels>
    <channel>
      <index>393218</index>
      <config>
        <index>393218</index>
        <loopback-mode>oc-opt-types:FACILITY</loopback-mode>
      </config>
    </channel>
  </logical-channels>
</terminal-device>
```

OcNos CLI Command

The below CLI command is used to configure loopback type on host interface.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#coherent-module 6
OcNOS(config-module)#host-interface 1
OcNOS(config-hostif)#loopback-type shallow
OcNOS(config-hostif)#commit
OcNOS(config-hostif)#
```

OcNOS Netconf Payload

Here is a sample OcNOS NetConf Payload to configure loopback type on host interface.

```
<terminal-device xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform-
terminal-device">
  <coherent-module>
    <slot-index>6</slot-index>
    <host-interfaces>
      <interface>
        <host-index>1</host-index>
        <config>
          <host-index>1</host-index>
          <loopback-type>shallow</loopback-type>
```

```
        </config>
      </interface>
    </host-interfaces>
  </coherent-module>
</terminal-device>
```

Validation with Netconf get

Get Openconfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <terminal-device xmlns="http://openconfig.net/yang/terminal-device">
    <logical-channels>
      <channel>
        <index>393218</index>
        <state/>
      </channel>
    </logical-channels>
  </terminal-device>
</filter>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for configuring loopback type on host interface.

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
  <logical-channels>
    <channel xmlns:oc-opt-types="http://openconfig.net/yang/transport-types">
      <index>393218</index>
      <state>
        <index>393218</index>
        <logical-channel-type>oc-opt-types:PROT_ETHERNET</logical-channel-
type>
        <trib-protocol>oc-opt-types:PROT_ODU4</trib-protocol>
        <description>preset</description>
        <loopback-mode>FACILITY</loopback-mode>
      </state>
      <ethernet>
        <state>
          <out-block-errors>0</out-block-errors>
          <out-pcs-bip-errors>0</out-pcs-bip-errors>
          <in-block-errors>0</in-block-errors>
          <in-pcs-bip-errors>2</in-pcs-bip-errors>
        </state>
      </ethernet>
    </channel>
  </logical-channels>
</terminal-device>
```

Unconfiguration

Use the delete operation remove this configuration, as shown below:

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
```

```
  <logical-channels>
    <channel>
      <index>393218</index>
      <config>
        <index>393218</index>
        <loopback-mode operation='delete'/>
      </config>
    </channel>
  </logical-channels>
</terminal-device>
```

Loopback-type on Network Interface

This configuration is used to configure loopback type on the network interface.

The two possible values are: FACILITY (shallow in NetConf mode) and TERMINAL (deep in NetConf mode).

Configuration

Configuration of deep mode at slot 6, Network interface 0, loopback-type to deep.

OpenConfig Netconf Payload

Here is a sample OpenConfig NetConf Payload to configure loopback type on the network interface.

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
  <logical-channels>
    <channel>
      <index>393472</index>
      <config>
        <index>393472</index>
        <loopback-mode>oc-opt-types:TERMINAL</loopback-mode>
      </config>
    </channel>
  </logical-channels>
</terminal-device>
```

OcNos CLI Command

The below CLI command is used to configure loopback type on the network interface.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#coherent-module 6
OcNOS(config-module)#network-interface 0
OcNOS(config-netif)#loopback-type deep
OcNOS(config-netif)#commit
```

OcNOS Netconf Payload

Here is a sample OcNOS NetConf Payload to configure loopback type on the network interface.

```
<terminal-device xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform-
terminal-device">
  <coherent-module>
    <slot-index>6</slot-index>
    <network-interfaces>
```

```
        <interface>
          <net-index>0</net-index>
          <config>
            <net-index>0</net-index>
            <loopback-type>deep</loopback-type>
          </config>
        </interface>
      </network-interfaces>
    </coherent-module>
  </terminal-device>
```

Validation with Netconf get

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below

```
<filter type="subtree">
  <terminal-device xmlns="http://openconfig.net/yang/terminal-device">
    <logical-channels>
      <channel>
        <index>393472</index>
        <state/>
      </channel>
    </logical-channels>
  </terminal-device>
</filter>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for configuring loopback type on the network interface.

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
  <logical-channels>
    <channel xmlns:oc-opt-types="http://openconfig.net/yang/transport-types">
      <index>393472</index>
      <state>
        <index>393472</index>
        <admin-state>ENABLED</admin-state>
        <logical-channel-type>oc-opt-types:PROT_OTN</logical-channel-type>
        <trib-protocol>oc-opt-types:PROT_OTU4</trib-protocol>
        <description>preset</description>
        <loopback-mode>TERMINAL</loopback-mode>
      </state>
      <logical-channel-assignments>
        <assignment>
          <index>1</index>
          <state>
            <index>1</index>
            <assignment-type>OPTICAL_CHANNEL</assignment-type>
            <optical-channel>OCH-6/0</optical-channel>
          </state>
        </assignment>
      </logical-channel-assignments>
      <otn>
        <state>
```

```
            <q-value>
              <instant>2.60</instant>
            </q-value>
            <fec-uncorrectable-blocks>0</fec-uncorrectable-blocks>
            <errored-blocks>0</errored-blocks>
          </state>
        </otn>
      </channel>
    </logical-channels>
</terminal-device>
```

Unconfiguration

Use the delete operation to remove this configuration, as shown below:

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
  <logical-channels>
    <channel>
      <index>393472</index>
      <config>
        <index>393472</index>
        <loopback-mode operation='delete'/>
      </config>
    </channel>
  </logical-channels>
</terminal-device>
```

Disable Coherent-Modules

Configuration

This configuration is used to disable coherent module 6.

OpenConfig Netconf Payload

Here is a sample NetConf Payload to disable coherent module 6.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
<name>SLOT-6</name>
    <linecard xmlns="http://openconfig.net/yang/platform/linecard">
      <config>
<power-admin-state>oc-platform-types:POWER_DISABLED</power-admin-state>
      </config>
</linecard>
  </component>
</components>
```

OcNos CLI Command

The below CLI command is used to disable coherent module 6

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#coherent-module 6
```

```
OcNOS(config-module)#disable
OcNOS(config-module)#commit
```

OcNOS Netconf Payload

Here is a sample NetConf Payload to disable coherent module 6.

```
<terminal-device xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform-
terminal-device">
  <coherent-module>
    <slot-index>6</slot-index>
    <config>
      <slot-index>6</slot-index>
      <service-enable operation='delete'/>
    </config>
  </coherent-module>
</terminal-device>
```

Validation with Netconf get

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<filter >
  <components xmlns="http://openconfig.net/yang/platform">
<component>
      <name>SLOT-6</name>
      <linecard xmlns="http://openconfig.net/yang/platform/linecard">
<state>
</state>
      </linecard>
</component>
  </components>
</filter>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for disabling coherent module 6.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>SLOT-6</name>
    <linecard xmlns="http://openconfig.net/yang/platform/linecard">
      <state>
        <power-admin-state>POWER_DISABLED</power-admin-state>
        <slot-id>6</slot-id>
      </state>
    </linecard>
    <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
      <name>SLOT-6</name>
      <equipment-failure xmlns="http://openconfig.net/yang/alarms">false</
equipment-failure>
      <temperature>
        <alarm-status>false</alarm-status>
      </temperature>
      <id>SLOT-6</id>
      <parent>CHASSIS</parent>
```

```
      <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:INACTIVE</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>6</location>
      <type xmlns:ipi-oc-platform-types-deviations="http://www.ipinfusion.com/
yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-types:LINECARD</type>
    </state>
    <subcomponents xmlns="http://openconfig.net/yang/platform">
      <subcomponent>
        <name>PORT-coherent-6</name>
        <state>
          <name>PORT-coherent-6</name>
        </state>
      </subcomponent>
      <subcomponent>
        <name>PORT-ce27</name>
        <state>
          <name>PORT-ce27</name>
        </state>
      </subcomponent>
      <subcomponent>
        <name>PORT-ce28</name>
        <state>
          <name>PORT-ce28</name>
        </state>
      </subcomponent>
    </subcomponents>
  </component>
</components>
```

Operational-Mode

This XML configuration snippet is used to select the operational modes.

Each mode configures specific modulation-format, fec-mode, speed, and grid-spacing.

Configuration

Configure operational-mode 6 at slot 6, interface 0.

OpenConfig Netconf Payload

Here is a sample OpenConfig NetConf Payload to select the operational modes.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-6/0</name>
    <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
```

```
        <config>
          <operational-mode>6</operational-mode>
        </config>
      </optical-channel>
    </component>
  </components>
```

OcNos CLI Command

The below CLI command is used to select the operational modes.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#coherent-module 6
OcNOS(config-module)#network-interface 0
OcNOS(config-netif)#operational-mode 6
OcNOS(config-netif)#commit
OcNOS(config-netif)#
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to select the operational modes.

```
<terminal-device xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform-
terminal-device">
  <coherent-module>
    <slot-index>6</slot-index>
    <network-interfaces>
      <interface>
        <net-index>0</net-index>
        <config>
          <net-index>0</net-index>
          <operational-mode>6</operational-mode>
        </config>
      </interface>
    </network-interfaces>
  </coherent-module>
</terminal-device>
```

Validation with Netconf get

Get Openconfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>OCH-6/0</name>
      <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
        <state>
          <operational-mode/>
        </state>
      </optical-channel>
    </component>
  </components>
</filter>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for selecting the operational modes.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-6/0</name>
    <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
      <state>
        <operational-mode>6</operational-mode>
      </state>
    </optical-channel>
    <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
      <id>OCH-6/0</id>
      <name>OCH-6/0</name>
      <parent>PORT-coherent-6</parent>
      <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:INACTIVE</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>0</location>
      <type xmlns:ipi-oc-platform-types-deviations="http://www.ipinfusion.com/
yang/ocnos/ipi-oc-platform-types-deviations">oc-opt-types:OPTICAL_CHANNEL</
type>
    </state>
  </component>
</components>
```

Unconfiguration

Use the delete operation to remove this configuration, as shown below:

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-6/0</name>
    <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
      <config>
<operational-mode operation='delete'/>
      </config>
    </optical-channel>
  </component>
</components>
```

Restriction

The acceptable values range is 1-6.

Soft-tx-disable

This XML configuration snippet is used to disable the transmission of data on a network interface.

Configuration

Disable transmission of slot 6, network interface 0.

OpenConfig Netconf Payload

Here is a sample OpenConfig NetConf Payload to disable the transmission of data on a network interface.

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
  <logical-channels>
<channel>
      <index>393472</index>
      <config>
        <index>393472</index>
        <admin-state>oc-opt-types:DISABLED</admin-state>
      </config>
</channel>
  </logical-channels>
</terminal-device>
```

OcNos CLI Command

The below CLI command is used to disable the transmission of data on a network interface.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#coherent-module 6
OcNOS(config-module)#network-interface 0
OcNOS(config-netif)#soft-tx-disable
OcNOS(config-netif)#commit
OcNOS(config-netif)#
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to disable the transmission of data on a network interface.

```
<terminal-device xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform-
terminal-device">
  <coherent-module>
    <slot-index>6</slot-index>
    <network-interfaces>
      <interface>
        <net-index>0</net-index>
        <config>
          <net-index>0</net-index>
          <soft-tx-disable/>
        </config>
      </interface>
    </network-interfaces>
  </coherent-module>
</terminal-device>
```

Validation with Netconf get

Get Openconfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <terminal-device xmlns="http://openconfig.net/yang/terminal-device">
    <logical-channels>
      <channel>
        <index>393472</index>
        <state>
          <admin-state/>
        </state>
      </channel>
    </logical-channels>
  </terminal-device>
</filter>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for disabling the transmission of data on a network interface.

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
    <logical-channels>
      <channel xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
        <index>393472</index>
        <state>
          <index>393472</index>
          <admin-state>DISABLED</admin-state>
          <logical-channel-type>oc-opt-types:PROT_OTN</logical-channel-type>
          <trib-protocol>oc-opt-types:PROT_OTU4</trib-protocol>
          <description>preset</description>
        </state>
        <logical-channel-assignments>
          <assignment>
            <index>1</index>
            <state>
              <index>1</index>
              <assignment-type>OPTICAL_CHANNEL</assignment-type>
              <optical-channel>OCH-6/0</optical-channel>
            </state>
          </assignment>
        </logical-channel-assignments>
      </channel>
    </logical-channels>
  </terminal-device>
```

Unconfiguration

Use the delete operation to remove this configuration, as shown below:

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
  <logical-channels>
    <channel>
```

```
      <index>196864</index>
        <config>
          <index>196864</index>
          <admin-state operation='delete'>
        </config>
      </channel>
    </logical-channels>
  </terminal-device>
```

tx-laser-freq

This XML configuration snippet is used to set the laser frequency for a network interface in Hz, THz, GHz, and MHz.

Configuration

Configure the frequency 196100GHz at slot 6 network interface 0.

OpenConfig Netconf Payload

Here is a sample OpenConfig NetConf Payload to set the laser frequency for a network interface in Hz, THz, GHz, and MHz.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-6/0</name>
    <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
      <config>
        <frequency>196100000.000000</frequency>
      </config>
    </optical-channel>
  </component>
</components>
```

OcNos CLI Command

Here is a sample CLI command used to set the laser frequency for a network interface.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#coherent-module 6
OcNOS(config-module)#network-interface 0
OcNOS(config-netif)#tx-laser-freq  196100000000000Hz
OcNOS(config-netif)#commit
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to set the laser frequency for a network interface.

```
<terminal-device xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform-
terminal-device">
  <coherent-module>
    <slot-index>6</slot-index>
    <network-interfaces>
      <interface>
        <net-index>0</net-index>
        <config>
          <net-index>0</net-index>
```

```
          <frequency>196100000.000000MHz</frequency>
        </config>
      </interface>
    </network-interfaces>
  </coherent-module>
</terminal-device>
```

Validation with Netconf get

Get Openconfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>OCH-6/0</name>
      <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
        <state>
          <oper-status/>
        </state>
      </optical-channel>
    </component>
  </components>
</filter>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for setting the laser frequency for a network interface.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-6/0</name>
    <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
      <state>
        <frequency xmlns:ipi-oc-terminal-device-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-terminal-device-deviations">191250000</
frequency>
        <line-port>PORT-coherent-6</line-port>
      </state>
    </optical-channel>
    <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
      <id>OCH-6/0</id>
      <name>OCH-6/0</name>
      <parent>PORT-coherent-6</parent>
      <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:DISABLED</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
```

```
      <location>0</location>
      <type xmlns:ipi-oc-platform-types-deviations="http://www.ipinfusion.com/
yang/ocnos/ipi-oc-platform-types-deviations">oc-opt-types:OPTICAL_CHANNEL</
type>
    </state>
  </component>
  <component>
    <name>CFP-6</name>
    <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
      <physical-channels>
        <channel>
          <index>1</index>
          <state>
            <index>1</index>
            <output-frequency xmlns:ipi-oc-platform-transceiver-
deviations="http://www.ipinfusion.com/yang/ocnos/ipi-oc-platform-transceiver-
deviations">191250000</output-frequency>
          </state>
        </channel>
      </physical-channels>
    </transceiver>
  </component>
</components>
```

Unconfiguration

Use the delete operation to remove this configuration, as shown below:

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-6/0</name>
    <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
      <config>
        <frequency operation='delete'/>
      </config>
    </optical-channel>
  </component>
</components>
```

Restriction

The permitted range is correlated to module brand.

tx-output-power

This XML configuration snippet is used to set the output power of the network interface in dBm.

Configuration

Configure tx-output-power to 1.0dBm at Slot 6, network-interface 0.

OpenConfig Netconf Payload

Here is a sample OpenConfig NetConf Payload to set the output power of the network interface in dBm.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-6/0</name>
    <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
      <config>
        <target-output-power>1.0</target-output-power>
      </config>
    </optical-channel>
  </component>
</components>
```

OcNos CLI Command

The below CLI command is used to set the output power of the network interface in dBm.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#coherent-module 6
OcNOS(config-module)#network-interface 0
OcNOS(config-netif)#tx-output-power 1.00
OcNOS(config-netif)#commit
OcNOS(config-netif)#
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to set the output power of the network interface in dBm.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-6/0</name>
    <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
      <config>
        <target-output-power>1.0</target-output-power>
      </config>
    </optical-channel>
  </component>
</components>
```

Validation with Netconf get

Get Openconfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>OCH-6/0</name>
      <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
<state>
          <target-output-power/>
</state>
      </optical-channel>
    </component>
  </components>
</filter>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for setting the output power of the network interface in dBm.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-6/0</name>
    <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
      <state>
        <target-output-power>1.00</target-output-power>
      </state>
    </optical-channel>
    <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
      <id>OCH-6/0</id>
      <name>OCH-6/0</name>
      <parent>PORT-coherent-6</parent>
      <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:ACTIVE</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>0</location>
      <type xmlns:ipi-oc-platform-types-deviations="http://www.ipinfusion.com/
yang/ocnos/ipi-oc-platform-types-deviations">oc-opt-types:OPTICAL_CHANNEL</
type>
    </state>
  </component>
</components>
```

Unconfiguration

Use the delete operation to remove this configuration, as shown below:

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-6/0</name>
    <optical-channel xmlns="http://openconfig.net/yang/terminal-device">
      <config>
        <target-output-power operation='delete'/>
      </config>
    </optical-channel>
  </component>
</components>
```

ISIS OpenConfig Translation

General Restrictions

Operation create

- NETCONF's `operation="create"` is only supported at *objectlist* elements. For example: `/network-instances/network-instance/protocols/protocol/isis/interfaces/interface[interface-id]`. Payloads with this operation on other elements have undefined behavior.

Deletion of AFI-SAFI

By default AF-IPv4 is always present on IS-IS global configuration and cannot be deleted. Deletion of this entry affects only its children configuration, if any. No error message is expected otherwise.

When deleting `/oc-netinst:network-instances/network-instance/protocols/protocol/isis/global/afi-safi` or `/oc-netinst:network-instances/network-instance/protocols/protocol/isis/global/afi-safi/af`, the following occurs:

- Operation="delete" will be placed at the supported attribute's nodes.
- If AF-IPv6 is configured, it will remove the entire element from `af` object-list.

Create IS-IS instance

This XML configuration snippet is used to configure an IS-IS instance.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure an IS-IS instance.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <global>
            <afi-safi>
```

```
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
            </afi-safi>
          </global>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABC</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure an IS-IS instance.

```
 router isis ABC
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure an IS-IS instance.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABC</instance>
      <config>
        <instance>ABC</instance>
        <vrf-name>default</vrf-name>
      </config>
    </isis-instance>
  </isis-instances>
</isis>
```

Restrictions

- An instance without AF-IPv4 support cannot be configured.

- AF-IPv4 cannot be deleted.
- Only safi-name UNICAST is supported.
- `operation="create"` is not supported on the *objectlist* `isis/global/afi-safi/af`.

Configure global parameters

This XML configuration snippet is used to configure the following IS-IS global parameters:

- *metric*
- *level-capability*
- *maximum-area-addresses*
- *net*

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS global parameters.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <global>
            <afi-safi>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <metric>10</metric>
                </config>
              </af>
            </afi-safi>
            <config>
```

```
              <level-capability>LEVEL_2</level-capability>
              <maximum-area-addresses>5</maximum-area-addresses>
              <net>49.0000.0000.0001.00</net>
            </config>
          </global>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABC</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI is used to configure IS-IS global parameters.

```
router isis ABC
 distance 10
 is-type level-2-only
 max-area-address 5
 net 49.0000.0000.0001.00
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS global parameters.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABC</instance>
      <config>
        <instance>ABC</instance>
        <distance>10</distance>
        <vrf-name>default</vrf-name>
        <level-capability>level-2-only</level-capability>
        <maximum-area-addresses>5</maximum-area-addresses>
      </config>
      <network-entity-title>
        <config>
          <net>49.0000.0000.0001.00</net>
        </config>
      </network-entity-title>
    </isis-instance>
  </isis-instances>
</isis>
```

Restrictions

None

Configure level traffic-engineering

This XML configuration snippet is used to configure IS-IS level traffic-engineering.

Release

This configuration was introduced in OcNOS version 6.5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS level traffic-engineering.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <levels >
            <level   >
              <level-number>1</level-number>
              <config >
                <metric-style>WIDE_METRIC</metric-style>
                <level-number>1</level-number>
              </config>
              <traffic-engineering  >
                <config>
                  <ipv4-router-id operation='delete' />
                  <enabled>true</enabled>
                </config>
              </traffic-engineering>
            </level>
            <level >
              <level-number>2</level-number>
              <config>
                <metric-style>WIDE_METRIC</metric-style>
                <level-number>2</level-number>
              </config>
              <traffic-engineering>
                <config>
                  <ipv4-router-id  />
                  <enabled>true</enabled>
                </config>
              </traffic-engineering>
            </level>
          </levels>
        </isis>
        <config>
          <identifier xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:ISIS</identifier>
          <name>ABC</name>
```

```
            <enabled>true</enabled>
          </config>
        </protocol>
      </protocols>
    </network-instance>
  </network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS level traffic-engineering.

```
router isis ABC
mpls traffic-eng router-id 10.10.0.23

router isis ABC
mpls traffic-eng ipv6 router-id 10.10.0.23
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS level traffic-engineering.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
    <isis-instances>
        <isis-instance>
            <instance>ABC</instance>
                <config>
                    <instance>ABC</instance>
                    <vrf-name>default</vrf-name>
                </config>
                <metric>
                    <style>wide</style>
                    <level-number>level-1-2</level-number>
                    <config>
                        <style>wide</style>
                        <level-number>level-1-2</level-number>
                    </config>
                </metric>
                <traffic-engineering>
                    <config>
                        <ipv4-router-id>10.10.0.11</ipv4-router-id>
                    </config>
                </traffic-engineering>
                <mpls-traffic-engg>
                    <config>
                        <enable-level-1 />
                        <enable-level-2 />
                    </config>
                </mpls-traffic-engg>
        </isis-instance>
    </isis-instances>
</isis>
```

Restrictions

- When configuring traffic-engineering on the OcNOS side, the router-id will be set up at both levels (level-1 and level-2) on the OpenConfig side.

- The configuration on the OpenConfig side must have the same router-ids for both levels.
- Deletion will only work if the router-ids for both levels are deleted.

Configure AF IPv6 support

This XML configuration snippet is used to configure IS-IS instance with IPv6 support.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS instance with IPv6 support.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABCv6</name>
        <isis>
          <global>
            <afi-safi>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV6</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV6</afi-name>
```

```
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
            </afi-safi>
          </global>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABCv6</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS instance with IPv6 support.

```
router isis ABCv6
 address-family ipv6
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS instance with IPv6 support.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABCv6</instance>
      <config>
        <instance>ABCv6</instance>
        <vrf-name>default</vrf-name>
      </config>
      <address-family-ipv6>
        <config>
          <afi-name>ipv6</afi-name>
        </config>
      </address-family-ipv6>
    </isis-instance>
  </isis-instances>
</isis>
```

Restrictions

None

Configure metric parameter on AF IPv6

This XML configuration snippet is used to configure IS-IS global parameter *metric* on AF IPv6.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS global parameter *metric* on AF IPv6.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABCv6</name>
        <isis>
          <global>
            <afi-safi>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV6</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV6</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <metric>20</metric>
```

```
                </config>
              </af>
            </afi-safi>
          </global>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABCv6</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS global parameter *metric* on AF IPv6.

```
router isis ABCv6
 address-family ipv6
  distance 20
  exit-address-family
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS global parameter *metric* on AF IPv6.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABCv6</instance>
      <config>
        <instance>ABCv6</instance>
        <vrf-name>default</vrf-name>
      </config>
      <address-family-ipv6>
        <config>
          <afi-name>ipv6</afi-name>
          <administrative-distance>20</administrative-distance>
        </config>
      </address-family-ipv6>
    </isis-instance>
  </isis-instances>
</isis>
```

Restrictions

None

Configure Global Timers parameters

This XML configuration snippet is used to configure the following IS-IS global timers parameters:

- *lsp-refresh-interval*
- *lsp-lifetime-interval*
- *spf-first-interval*
- *spf-second-interval*
- *lsp-max-wait-interval*

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS global timers parameters.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <global>
            <afi-safi>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
            </afi-safi>
            <timers>
              <config>
                <lsp-refresh-interval>1</lsp-refresh-interval>
                <lsp-lifetime-interval>350</lsp-lifetime-interval>
              </config>
              <spf>
```

```
                <config>
                  <spf-first-interval>0</spf-first-interval>
                  <spf-second-interval>2147483647</spf-second-interval>
                </config>
              </spf>
              <lsp-generation>
                <config>
                  <lsp-max-wait-interval>40</lsp-max-wait-interval>
                </config>
              </lsp-generation>
            </timers>
          </global>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABC</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS global timers parameters.

```
router isis ABC
 lsp-gen-interval 40
 lsp-refresh-interval 1
 max-lsp-lifetime 350
 spf-interval-exp 0 2147483647
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS global timers parameters.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABC</instance>
      <config>
        <instance>ABC</instance>
        <vrf-name>default</vrf-name>
      </config>
      <timers>
        <config>
          <lsp-refresh-interval>1</lsp-refresh-interval>
          <lsp-lifetime-interval>350</lsp-lifetime-interval>
        </config>
      </timers>
      <spf-levels>
        <spf-level>
          <level>level-1-2</level>
```

```
            <spf-delay>
              <spf-min-delay>0</spf-min-delay>
              <spf-max-delay>2147483647</spf-max-delay>
              <config>
                <spf-min-delay>0</spf-min-delay>
                <spf-max-delay>2147483647</spf-max-delay>
              </config>
            </spf-delay>
            <config>
              <level>level-1-2</level>
            </config>
          </spf-level>
        </spf-levels>
        <levels>
          <level>
            <type>level-1-2</type>
            <config>
              <type>level-1-2</type>
              <lsp-max-wait-interval>40</lsp-max-wait-interval>
            </config>
          </level>
        </levels>
      </isis-instance>
    </isis-instances>
  </isis>
```

Restrictions

The following timer parameters are supported only in OcNOS level-1-2.

- *spf-interval-exp*
- *max-lsp-lifetime*
- *lsp-max-wait-interval*

Configure Global Transport parameter

This XML configuration snippet is used to configure IS-IS global transport parameter *lsp-mtu-size*.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS global transport parameter *lsp-mtu-size*.

```
  <network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
      <name>default</name>
      <protocols>
        <protocol>
          <identifier
```

```
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <global>
            <afi-safi>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
            </afi-safi>
            <transport>
              <config>
                <lsp-mtu-size>600</lsp-mtu-size>
              </config>
            </transport>
          </global>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABC</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS global transport parameter *lsp-mtu-size*.

```
router isis ABC
 lsp-mtu 600
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS global transport parameter *lsp-mtu-size*.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABC</instance>
```

```
      <config>
        <instance>ABC</instance>
        <vrf-name>default</vrf-name>
      </config>
      <levels>
        <level>
          <type>level-1-2</type>
          <config>
            <type>level-1-2</type>
            <lsp-mtu-size>600</lsp-mtu-size>
          </config>
        </level>
      </levels>
    </isis-instance>
  </isis-instances>
</isis>
```

Restrictions

The parameter *lsp-mtu-size* is only supported on OcNOS level-1-2.

Configure LSP-BIT parameter

This XML configuration snippet is used to configure IS-IS global parameter LSP-BIT's *set-bit* and *set-bit-on-boot*.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS global parameter LSP-BIT's *set-bit* and *set-bit-on-boot*.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <global>
            <afi-safi>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
```

```
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
            </afi-safi>
            <lsp-bit>
              <overload-bit>
                <config>
                  <set-bit>true</set-bit>
                  <set-bit-on-boot>true</set-bit-on-boot>
                </config>
                <reset-triggers>
                  <reset-trigger>
                    <reset-trigger
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:WAIT_FOR_BGP</reset-trigger>
                    <config>
                      <reset-trigger
                        xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:WAIT_FOR_BGP</reset-trigger>
                    </config>
                  </reset-trigger>
                </reset-triggers>
              </overload-bit>
            </lsp-bit>
          </global>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABC</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS global parameter LSP-BIT's *set-bit* and *set-bit-on-boot*.

```
router isis ABC
 set-overload-bit on-startup wait-for-bgp
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS global parameter LSP-BIT's *set-bit* and *set-bit-on-boot.*

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
```

```
    <isis-instance>
      <instance>ABC</instance>
      <config>
        <instance>ABC</instance>
        <vrf-name>default</vrf-name>
      </config>
      <lsp-over-load>
        <config>
          <enabled/>
          <set-bit-on-boot>wait-for-bgp</set-bit-on-boot>
        </config>
      </lsp-over-load>
    </isis-instance>
  </isis-instances>
</isis>
```

Restrictions

- When *set-bit-on-boot* is set, *reset-trigger* is always *oc-isis-types: WAIT_FOR_BGP*.
- `operation="create"` is not supported on *objectlist* `lsp-bit/overload-bit/reset-triggers/reset-trigger`.

Configure Inter-level Propagation Policies parameter

This XML configuration snippet is used to configure the foloowing IS-IS inter-level propagation policies:

- *level1-to-level2*
- *level2-to-level1*

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS inter-level propagation policies.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <global>
            <afi-safi>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
```

```
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
            </afi-safi>
            <inter-level-propagation-policies>
              <level1-to-level2>
                <config>
                  <default-import-policy>ACCEPT_ROUTE</default-import-policy>
                </config>
              </level1-to-level2>
              <level2-to-level1>
                <config>
                  <default-import-policy>ACCEPT_ROUTE</default-import-policy>
                </config>
              </level2-to-level1>
            </inter-level-propagation-policies>
          </global>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABC</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS inter-level propagation policies.

```
router isis ABC
 redistribute isis level-1 into level-2
 redistribute isis level-2 into level-1
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS inter-level propagation policies.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABC</instance>
      <config>
        <instance>ABC</instance>
```

```
          <vrf-name>default</vrf-name>
        </config>
        <address-family-ipv4>
          <redistribute-level-1-into-2>
            <enable/>
            <config>
              <enable/>
            </config>
          </redistribute-level-1-into-2>
          <redistribute-level-2-into-1>
            <enable/>
            <config>
              <enable/>
            </config>
          </redistribute-level-2-into-1>
        </address-family-ipv4>
      </isis-instance>
    </isis-instances>
  </isis>
```

Restrictions

None

Configure Graceful Restart parameter

This XML configuration snippet is used to configure IS-IS *graceful restart* parameter.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS *graceful restart* parameter.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <global>
            <afi-safi>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                <safi-name
```

```
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
            </afi-safi>
            <graceful-restart>
              <config>
                <enabled>false</enabled>
              </config>
            </graceful-restart>
          </global>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABC</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS *graceful restart* parameter.

```
router isis ABC
 no capability restart graceful
```

OcNOS NetConf Payload

Here is a sample NetConf Payload to configure IS-IS *graceful restart* parameter.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABC</instance>
      <config>
        <instance>ABC</instance>
        <vrf-name>default</vrf-name>
        <disable-gr-capability/>
      </config>
    </isis-instance>
  </isis-instances>
</isis>
```

Restrictions

- IS-IS *Graceful Restart* is enabled by default on OcNOS.

Configure Metric Style parameter

This XML configuration snippet is used to configure IS-IS *metric-style* parameter.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS *metric-style* parameter.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <levels>
            <level>
              <level-number>1</level-number>
              <config>
                <metric-style>WIDE_METRIC</metric-style>
                <level-number>1</level-number>
              </config>
            </level>
          </levels>
          <global>
            <afi-safi>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
            </afi-safi>
```

```
          </global>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABC</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS *metric-style* parameter.

```
router isis ABC
 metric-style wide level-1
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS *metric-style* parameter.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABC</instance>
      <metric>
        <style>wide</style>
        <level-number>level-1</level-number>
        <config>
          <style>wide</style>
          <level-number>level-1</level-number>
        </config>
      </metric>
      <config>
        <instance>ABC</instance>
        <vrf-name>default</vrf-name>
      </config>
    </isis-instance>
  </isis-instances>
</isis>
```

Restrictions

- When configuring *metric-style* parameter on both levels together, both the values must match.

Configure Authentication parameter

This XML configuration snippet is used to configure IS-IS instance *authentication*.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS instance *authentication*.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <global>
            <afi-safi>
              <af>
                <afi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                <safi-name
                  xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                <config>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                </config>
              </af>
            </afi-safi>
          </global>
          <levels>
            <level>
              <level-number>1</level-number>
              <authentication>
                <config>
                  <auth-password>A-PWD</auth-password>
                </config>
              </authentication>
              <config>
                <level-number>1</level-number>
              </config>
            </level>
            <level>
              <level-number>2</level-number>
              <authentication>
                <config>
                  <auth-password>D-PWD</auth-password>
                </config>
              </authentication>
```

```
              <config>
                <level-number>2</level-number>
              </config>
            </level>
          </levels>
        </isis>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</identifier>
          <name>ABC</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS instance *authentication*.

```
router isis ABC
 area-password A-PWD
 domain-password D-PWD
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS instance *authentication*.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABC</instance>
      <config>
        <instance>ABC</instance>
        <vrf-name>default</vrf-name>
      </config>
      <area-authentication>
        <config>
          <area-password>A-PWD</area-password>
        </config>
      </area-authentication>
      <domain-authentication>
        <config>
          <domain-password>D-PWD</domain-password>
        </config>
      </domain-authentication>
    </isis-instance>
  </isis-instances>
</isis>
```

Restrictions

None

Configure Interface IS-IS Parameter

This XML configuration snippet is used to associate an interface to an IS-IS instance:

- *interface-id*
- *hello-padding.*

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to associate an interface to an IS-IS instance.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <interfaces>
            <interface>
              <interface-id>eth2</interface-id>
              <interface-ref>
                <config>
                  <interface>eth2</interface>
                </config>
              </interface-ref>
              <config>
                <interface-id>eth2</interface-id>
                <hello-padding>STRICT</hello-padding>
              </config>
              <afi-safi>
                <af>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <config>
                    <afi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                    <safi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  </config>
                </af>
              </afi-safi>
```

```
            </interface>
          </interfaces>
        </isis>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to associate an interface to an IS-IS instance.

```
interface eth2
 ip address 22.22.22.10/24
 ip router isis ABC
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to associate an interface to an IS-IS instance.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <interfaces>
    <interface>
      <name>eth2</name>
      <config>
        <name>eth2</name>
      </config>
      <interface-parameters>
        <config>
          <ipv4-instance-tag>ABC</ipv4-instance-tag>
        </config>
      </interface-parameters>
    </interface>
  </interfaces>
</isis>
```

Restrictions

- There is a deviation to make `oc-netinst:isis/interfaces/interface/afi-safi/af` mandatory when `oc-netinst:isis/interfaces/interface` is being configured.
- On OcNOS, IS-IS interface-related configuration can be applied even if the IS-IS instance is not yet created. In this case, edit operations using OpenConfig namespace will not work.

Configure Interface Authentication Parameter

This XML configuration snippet is used to configure IS-IS *interface authentication*.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS *interface authentication*.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <interfaces>
            <interface>
              <interface-id>eth2</interface-id>
              <interface-ref>
                <config>
                  <interface>eth2</interface>
                </config>
              </interface-ref>
              <config>
                <interface-id>eth2</interface-id>
                <hello-padding>STRICT</hello-padding>
              </config>
              <afi-safi>
                <af>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <config>
                    <afi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                    <safi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  </config>
                </af>
              </afi-safi>
              <levels>
                <level>
                  <level-number>1</level-number>
                  <config>
                    <level-number>1</level-number>
                  </config>
                  <hello-authentication>
                    <config>
                      <auth-password>ABCDEFGHIJ</auth-password>
                    </config>
                  </hello-authentication>
                </level>
              </levels>
            </interface>
```

```
          </interfaces>
        </isis>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS *interface authentication*.

```
interface eth2
 ip address 22.22.22.10/24
 ip router isis ABC
 isis password ABCDEFGHIJ level-1
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS *interface authentication*.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <interfaces>
    <interface>
      <name>eth2</name>
      <config>
        <name>eth2</name>
      </config>
      <interface-parameters>
        <config>
          <ipv4-instance-tag>ABC</ipv4-instance-tag>
        </config>
        <level-infos>
          <level-info>
            <level>level-1</level>
            <config>
              <level>level-1</level>
              <password>ABCDEFGHIJ</password>
            </config>
          </level-info>
        </level-infos>
      </interface-parameters>
    </interface>
  </interfaces>
</isis>
```

Restrictions

None

Configure Interface IGP-LDP-SYNC Parameter

This XML configuration snippet is used to configure IS-IS *igp-ldp-sync* parameter.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS *igp-ldp-sync* parameter.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <interfaces>
            <interface>
              <interface-id>eth2</interface-id>
              <interface-ref>
                <config>
                  <interface>eth2</interface>
                </config>
              </interface-ref>
              <config>
                <interface-id>eth2</interface-id>
                <hello-padding>STRICT</hello-padding>
              </config>
              <afi-safi>
                <af>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <config>
                    <afi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                    <safi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  </config>
                </af>
              </afi-safi>
              <mpls>
                <igp-ldp-sync>
                  <config>
                    <enabled>true</enabled>
                  </config>
                </igp-ldp-sync>
              </mpls>
            </interface>
          </interfaces>
```

```
        </isis>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS *igp-ldp-sync* parameter.

```
interface eth2
 mpls ldp-igp sync isis level-1-2
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS *igp-ldp-sync* parameter.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <interfaces>
    <interface>
      <name>eth2</name>
      <config>
        <name>eth2</name>
      </config>
      <interface-parameters>
        <config>
          <ipv4-instance-tag>ABC</ipv4-instance-tag>
        </config>
      </interface-parameters>
      <igp-ldp-sync>
        <config>
          <level>level-1-2</level>
          <hold-timer>70000</hold-timer>
        </config>
      </igp-ldp-sync>
    </interface>
  </interfaces>
</isis>
```

Restrictions

- When *igp-ldp-sync* is configured, OcNOS will use a default *hold-timer* value of 70000.
- This parameter is only supported on OcNOS level-1-2.

Configure Interface Circuit-type Parameter

This XML configuration snippet is used to configure IS-IS interface's *circuit-type* parameter.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS interface's *circuit-type* parameter.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <interfaces>
            <interface>
              <interface-id>eth2</interface-id>
              <interface-ref>
                <config>
                  <interface>eth2</interface>
                </config>
              </interface-ref>
              <config>
                <interface-id>eth2</interface-id>
                <hello-padding>STRICT</hello-padding>
                <circuit-type>POINT_TO_POINT</circuit-type>
              </config>
              <afi-safi>
                <af>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <config>
                    <afi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                    <safi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  </config>
                </af>
              </afi-safi>
            </interface>
          </interfaces>
        </isis>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS interface's *circuit-type* parameter.

```
interface eth2
 isis network point-to-point
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS interface's *circuit-type* parameter.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <interfaces>
    <interface>
      <name>eth2</name>
      <config>
        <name>eth2</name>
      </config>
      <interface-parameters>
        <config>
          <network-type>point-to-point</network-type>
          <ipv4-instance-tag>ABC</ipv4-instance-tag>
        </config>
      </interface-parameters>
    </interface>
  </interfaces>
</isis>
```

Restrictions

None

Configure Primary IP Address

This XML configuration snippet is used to configure IS-IS *hello-padding* parameter.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS *hello-padding* parameter.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <interfaces>
            <interface>
              <interface-id>eth2</interface-id>
```

```
                <interface-ref>
                  <config>
                    <interface>eth2</interface>
                  </config>
                </interface-ref>
                <config>
                  <interface-id>eth2</interface-id>
                  <hello-padding>DISABLE</hello-padding>
                </config>
                <afi-safi>
                  <af>
                    <afi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                    <safi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                    <config>
                      <afi-name
                        xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                      <safi-name
                        xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                    </config>
                  </af>
                </afi-safi>
              </interface>
            </interfaces>
          </isis>
        </protocol>
      </protocols>
    </network-instance>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS *hello-padding* parameter.

```
interface eth2
 no isis hello padding
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS *hello-padding* parameter.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <interfaces>
    <interface>
      <name>eth2</name>
      <config>
        <name>eth2</name>
      </config>
      <interface-parameters>
        <config>
          <ipv4-instance-tag>ABC</ipv4-instance-tag>
          <disable-padding/>
        </config>
```

```
      </interface-parameters>
    </interface>
  </interfaces>
</isis>
```

Restrictions

- IS-IS *hello-padding* is enabled by default on OcNOS.
- Only OpenConfig's *DISABLE* value is supported.

Configure Interface Passive Parameter

This XML configuration snippet is used to configure IS-IS *passive* parameter.

Note: On OcNOS, this attribute is configured at the instance mode, whereas on OpenConfig, it's at interface.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS *passive* parameter.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <interfaces>
            <interface>
              <interface-id>eth2</interface-id>
              <config>
                <interface-id>eth2</interface-id>
                <passive>true</passive>
                <hello-padding>STRICT</hello-padding>
              </config>
              <interface-ref>
                <config>
                  <interface>eth2</interface>
                </config>
              </interface-ref>
              <afi-safi>
                <af>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
```

```
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <config>
                    <afi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                    <safi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  </config>
                </af>
              </afi-safi>
            </interface>
          </interfaces>
        </isis>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS *passive* parameter.

```
router isis ABC
 passive-interface eth2
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS *passive* parameter.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <isis-instances>
    <isis-instance>
      <instance>ABC</instance>
      <config>
        <instance>ABC</instance>
        <vrf-name>default</vrf-name>
      </config>
      <passive-interfaces>
        <passive-interface>
          <name>eth2</name>
          <config>
            <name>eth2</name>
          </config>
        </passive-interface>
      </passive-interfaces>
    </isis-instance>
  </isis-instances>
</isis>
```

Restrictions

None

Configure Interface IPv6 AF Parameter

This XML configuration snippet is used to configure IS-IS IPv6 support parameter.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS IPv6 support parameter.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABCv6</name>
        <isis>
          <interfaces>
            <interface>
              <interface-id>eth3</interface-id>
              <interface-ref>
                <config>
                  <interface>eth3</interface>
                </config>
              </interface-ref>
              <config>
                <interface-id>eth3</interface-id>
                <hello-padding>STRICT</hello-padding>
              </config>
              <afi-safi>
                <af>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV6</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <config>
                    <afi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV6</afi-name>
                    <safi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  </config>
                </af>
              </afi-safi>
            </interface>
          </interfaces>
        </isis>
```

```
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS IPv6 support parameter.

```
interface eth3
 ipv6 router isis ABCv6
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS IPv6 support parameter.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <interfaces>
    <interface>
      <name>eth3</name>
      <config>
        <name>eth3</name>
      </config>
      <interface-parameters>
        <config>
          <ipv6-instance-tag>ABCv6</ipv6-instance-tag>
        </config>
      </interface-parameters>
    </interface>
  </interfaces>
</isis>
```

Restrictions

None

Configure Interface BFD Parameter

This XML configuration snippet is used to configure IS-IS *enable-bfd* parameter**.**

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS *enable-bfd* parameter**.**

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
```

```
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <interfaces>
            <interface>
              <interface-id>eth2</interface-id>
              <interface-ref>
                <config>
                  <interface>eth2</interface>
                </config>
              </interface-ref>
              <config>
                <interface-id>eth2</interface-id>
                <hello-padding>STRICT</hello-padding>
              </config>
              <afi-safi>
                <af>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <config>
                    <afi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                    <safi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  </config>
                </af>
              </afi-safi>
              <enable-bfd>
                <config>
                  <enabled>true</enabled>
                </config>
              </enable-bfd>
            </interface>
          </interfaces>
        </isis>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS *enable-bfd* parameter.

```
interface eth2
 isis bfd
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS *enable-bfd* parameter.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <interfaces>
    <interface>
      <name>eth2</name>
      <config>
        <name>eth2</name>
      </config>
      <interface-parameters>
        <config>
          <ipv4-instance-tag>ABC</ipv4-instance-tag>
        </config>
        <bfd>
          <config>
            <enable/>
          </config>
        </bfd>
      </interface-parameters>
    </interface>
  </interfaces>
</isis>
```

Restrictions

None

Configure Interface Priority Parameter

This XML configuration snippet is used to configure IS-IS *priority* parameter.

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS *priority* parameter.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <interfaces>
            <interface>
```

```
              <interface-id>eth2</interface-id>
              <interface-ref>
                <config>
                  <interface>eth2</interface>
                </config>
              </interface-ref>
              <config>
                <interface-id>eth2</interface-id>
                <hello-padding>STRICT</hello-padding>
              </config>
              <afi-safi>
                <af>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <config>
                    <afi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                    <safi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  </config>
                </af>
              </afi-safi>
              <levels>
                <level>
                  <level-number>1</level-number>
                  <config>
                    <level-number>1</level-number>
                    <priority>50</priority>
                  </config>
                </level>
              </levels>
            </interface>
          </interfaces>
        </isis>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to configure IS-IS *priority* parameter.

```
interface eth2
 isis priority 50 level-1
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS *priority* parameter.

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
```

```
    <interfaces>
      <interface>
        <name>eth2</name>
        <config>
          <name>eth2</name>
        </config>
        <interface-parameters>
          <config>
            <ipv4-instance-tag>ABC</ipv4-instance-tag>
          </config>
          <level-infos>
            <level-info>
              <level>level-1</level>
              <config>
                <level>level-1</level>
                <priority>50</priority>
              </config>
            </level-info>
          </level-infos>
        </interface-parameters>
      </interface>
    </interfaces>
  </isis>
```

Restrictions

- The OcNOS *level-1-2* value for level-info is not supported by OpenConfig.
  - `/isis/interfaces/interface/interface-parameters/level-infos/level-info`
- The XPath related to interfaces `level-number` below can only have values "1" or "2".

  1. `/oc-netinst:network-instances/network-instance[name]/protocols/protocol[identifier][name]/isis/interfaces/interface[interface-id]/levels/level[level-number]/level-number`

  2. `/oc-netinst:network-instances/network-instance[name]/protocols/protocol[identifier][name]/isis/interfaces/interface[interface-id]/levels/level[level-number]/config/level-number`

Configure Interface Timers Parameter

This XML configuration snippet is used to configure the following IS-IS parameters:

- *hello-interval*
- *hello-multiplier*

Release

This configuration was introduced in OcNOS version 6.4.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure IS-IS parameters *hello-interval* and *hello-multiplier*.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:ISIS</identifier>
        <name>ABC</name>
        <isis>
          <interfaces>
            <interface>
              <interface-id>eth2</interface-id>
              <interface-ref>
                <config>
                  <interface>eth2</interface>
                </config>
              </interface-ref>
              <config>
                <interface-id>eth2</interface-id>
                <hello-padding>STRICT</hello-padding>
              </config>
              <afi-safi>
                <af>
                  <afi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                  <safi-name
                    xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  <config>
                    <afi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:IPV4</afi-name>
                    <safi-name
                      xmlns:oc-isis-types="http://openconfig.net/yang/isis-
types">oc-isis-types:UNICAST</safi-name>
                  </config>
                </af>
              </afi-safi>
              <levels>
                <level>
                  <level-number>1</level-number>
                  <config>
                    <level-number>1</level-number>
                  </config>
                  <timers>
                    <config>
                      <hello-interval>1</hello-interval>
                    </config>
                  </timers>
                </level>
                <level>
                  <level-number>2</level-number>
                  <config>
                    <level-number>2</level-number>
                  </config>
                  <timers>
```

```
                    <config>
                      <hello-multiplier>2</hello-multiplier>
                    </config>
                  </timers>
                </level>
              </levels>
            </interface>
          </interfaces>
        </isis>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLi command is used to configure IS-IS parameters *hello-interval* and *hello-multiplier.*

```
interface eth2
 isis hello-interval 1 level-1
 isis hello-multiplier 2 level-2
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure IS-IS parameters *hello-interval* and *hello-multiplier.*

```
<isis xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-isis">
  <interfaces>
    <interface>
      <name>eth2</name>
      <config>
        <name>eth2</name>
      </config>
      <interface-parameters>
        <config>
          <ipv4-instance-tag>ABC</ipv4-instance-tag>
        </config>
        <level-infos>
          <level-info>
            <level>level-1</level>
            <config>
              <level>level-1</level>
              <hello-interval>1</hello-interval>
            </config>
          </level-info>
          <level-info>
            <level>level-2</level>
            <config>
              <level>level-2</level>
              <hello-multiplier>2</hello-multiplier>
            </config>
          </level-info>
        </level-infos>
      </interface-parameters>
    </interface>
  </interfaces>
```

```
</isis>
```

Restrictions

- The OcNOS *level-1-2* value for level-info is not supported by OpenConfig.
  - `/isis/interfaces/interface/interface-parameters/level-infos/level-info`
- The XPath related to interfaces `level-number` below can only have values "1" or "2".

  1. `/oc-netinst:network-instances/network-instance[name]/protocols/protocol[identifier][name]/isis/interfaces/interface[interface-id]/levels/level[level-number]/level-number`

  2. `/oc-netinst:network-instances/network-instance[name]/protocols/protocol[identifier][name]/isis/interfaces/interface[interface-id]/levels/level[level-number]/config/level-number`

BGP OpenConfig Translation

Create BGP Instance

This XML configuration snippet is used to initiate a BGP process with the associated autonomous system number and router ID.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload for configuring a BGP process within a network instance. It sets the BGP autonomous system number (AS) and specifies the router ID.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">
        <identifier>oc-pol-types:BGP</identifier>
        <name>100</name>
        <config>
          <identifier>oc-pol-types:BGP</identifier>
          <name>100</name>
        </config>
        <bgp>
          <global>
            <config>
              <as>100</as>
              <router-id>1.2.3.4</router-id>
            </config>
          </global>
        </bgp>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI commands are used to configure a BGP process with the AS number and set the BGP router ID.

```
router bgp 100
bgp router-id 1.2.3.4
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload used to configure a network instance with the name and type. It also configures a BGP instance with an AS number and sets the BGP router ID.

```
<network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">
    <network-instance>
        <instance-name>default</instance-name>
        <instance-type>vrf</instance-type>
        <config>
            <instance-name>default</instance-name>
            <instance-type>vrf</instance-type>
        </config>
        <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
            <config>
                <vrf-name>default</vrf-name>
            </config>
        </vrf>
    </network-instance>
</network-instances>
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>100</bgp-as>
            <config>
                <bgp-as>100</bgp-as>
                <router-id>1.2.3.4</router-id>
            </config>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Validation with NetConf get

Here is a NetConf validation response that provides information about the enabled state and identifiers, as well as details about the BGP global configuration, including the AS number and router ID.

```
        <network-instances xmlns="http://openconfig.net/yang/network-
instance">
      <network-instance>
        <name>default</name>
        <config>
          <name>default</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
        </config>
        <state>
          <name>default</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
        </state>
        <protocols>
          <protocol>
            <identifier
```

```
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
            <name>DIRECTLY_CONNECTED</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
              <name>DIRECTLY_CONNECTED</name>
              <enabled>true</enabled>
            </config>
            <state>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
              <name>DIRECTLY_CONNECTED</name>
              <enabled>true</enabled>
            </state>
          </protocol>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
            <name>100</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:BGP</identifier>
              <name>100</name>
              <enabled>true</enabled>
            </config>
            <bgp>
              <global>
                <config>
                  <as>100</as>
                  <router-id>1.2.3.4</router-id>
                </config>
                <state>
                  <as>100</as>
                </state>
                <global>
                  <state>
                    <router-id>1.2.3.4</router-id>
                  </state>
                </global>
              </global>
            </bgp>
            <state>
              <enabled>true</enabled>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:BGP</identifier>
              <name>100</name>
            </state>
          </protocol>
        </protocols>
      </network-instance>
    </network-instances>
```

Restrictions

Address families supported:

The OpenConfig datamodel does not support all the address-family types that OcNOS datamodel contains. The address-family values are defined on identity `AFI_SAFI_TYPE` on OpenConfig file public/release/models/bgp/openconfig-bgp-types.yang at master · openconfig/public.

The table below shows all the address-family types that are supported. The address-family types that are not listed are translated as “UNDEFINED” on NETCONF GET/SGET operations.

OcNOS Address-family type	OpenConfig Address-family type
ipv4_unicast	`IPV4_UNICAST`
ipv4_multicast	`IPV4_MULTICAST`
ipv4_labeled-unicast	`IPV4_LABELED_UNICAST`
ipv4_vpn-unicast	`L3VPN_IPV4_UNICAST`
ipv6_unicast	`IPV6_UNICAST`
ipv6_labeled-unicast	`IPV6_LABELED_UNICAST`
ipv6_vpn-unicast	`L3VPN_IPV6_UNICAST`
l2vpn_evpn	`L2VPN_EVPN`
l2vpn_vpls	`L2VPN_VPLS`
link-state_link-state	`LINKSTATE`

BGP naming rule:

For BGP instances, the leaf `/network-instances/network-instance/protocols/protocol/name` must have the same number of the `/network-instances/network-instance/protocols/protocol/bgp/global/config/as` instance.

Create BGP Global with default VRF

This XML configuration snippet is used to set up BGP Global configuration with default VRF data from the OpenConfig perspective.

Ensure that the **AFI-SAFI** container is present in the applied configuration to facilitate the configuration of address families.

Release

This configuration was introduced in OcNOS version 6.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload to define BGP settings for the default network instance, including global BGP parameters, neighbor configurations, and address family tables.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <config>
      <name>default</name>
```

```
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
    </config>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</identifier>
        <name>DIRECTLY_CONNECTED</name>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </config>
      </protocol>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
                <add-paths>
                  <config>
                    <receive>true</receive>
                    <send>true</send>
                    <send-max>2</send-max>
                  </config>
                </add-paths>
                <use-multiple-paths>
                  <ibgp>
                    <config>
                      <maximum-paths>7</maximum-paths>
                    </config>
                  </ibgp>
                </use-multiple-paths>
              </afi-safi>
            </afi-safis>
            <confederation>
              <config>
                <member-as>48</member-as>
                <identifier>600</identifier>
              </config>
            </confederation>
```

```
            <config>
              <as>100</as>
              <router-id>1.2.3.4</router-id>
            </config>
            <route-selection-options>
              <config>
                <enable-aigp>false</enable-aigp>
                <ignore-as-path-length>true</ignore-as-path-length>
                <external-compare-router-id>true</external-compare-router-id>
              </config>
            </route-selection-options>
            <graceful-restart>
              <config>
                <restart-time>100</restart-time>
                <stale-routes-time>300.00</stale-routes-time>
                <helper-only>false</helper-only>
              </config>
            </graceful-restart>
          </global>
          <neighbors>
            <neighbor>
              <neighbor-address>10.1.1.2</neighbor-address>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                </afi-safi>
              </afi-safis>
              <config>
                <enabled>true</enabled>
                <neighbor-address>10.1.1.2</neighbor-address>
                <peer-as>100</peer-as>
              </config>
            </neighbor>
          </neighbors>
        </bgp>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>100</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
    <tables>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
```

```
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </config>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
      </table>
    </tables>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI commands are used to configure BGP settings for a specified AS number on a networking device. They define critical attributes of the BGP process, including the router ID, confederation settings, best path selection criteria, graceful restart behavior, and neighbor configuration. Additionally, the commands enable support for IPv4 unicast address families and specify advanced options like additional path handling and maximum path selection for internal BGP peers. The neighbor statement establishes a BGP neighbor relationship with an adjacent router using the IP address and assigns it to a specified AS number.

```
router bgp 100
```

```
 bgp router-id 1.2.3.4
 bgp confederation identifier 600
 bgp confederation peers 48
 bgp bestpath as-path ignore
 bgp bestpath aigp ignore
 bgp bestpath compare-routerid
 bgp graceful-restart restart-time 100
 bgp graceful-restart stalepath-time 300
 bgp graceful-restart graceful-reset
 neighbor 10.1.1.2 remote-as 100
 !
 address-family ipv4 unicast
 bgp additional-paths send-receive
 bgp additional-paths select best 2
 max-paths ibgp 7
 neighbor 10.1.1.2 activate
 exit-address-family
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload for configuring BGP settings on a network device. It defines a BGP instance with AS number and sets its router ID, graceful restart parameters, route selection options, and address family settings. Specifically, it configures BGP to operate with IPv4 unicast address families, allowing for the exchange of IPv4 unicast routing information. Additionally, the payload specifies additional path handling, maximum path selection for internal BGP peers, and establishes a BGP neighbor relationship with an adjacent router using the IP address.

```
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>100</bgp-as>
            <config>
                <bgp-as>100</bgp-as>
                <router-id>1.2.3.4</router-id>
                <ignore-aigp-for-bestpath />
            </config>
            <graceful-restart>
                <config>
                    <restart-time>100</restart-time>
                    <stale-path-max-retention-time>300</stale-path-max-
retention-time>
                    <graceful-reset />
                </config>
            </graceful-restart>
            <route-selection>
                <config>
                    <ignore-as-path-length />
                    <external-compare-router-id />
                </config>
            </route-selection>
            <address-families>
                <address-family>
                    <afi>ipv4</afi>
                    <safi>unicast</safi>
                    <config>
                        <afi>ipv4</afi>
                        <safi>unicast</safi>
```

```
                        <additional-paths-best-select-count>2</additional-
paths-best-select-count>
                        <additional-paths-mode>receive send</additional-paths-
mode>
                    </config>
                    <maximum-paths>
                        <config>
                            <ibgp-max-path>7</ibgp-max-path>
                        </config>
                    </maximum-paths>
                </address-family>
            </address-families>
            <peers>
                <peer>
                    <peer-address>10.1.1.2</peer-address>
                    <address-families>
                        <address-family>
                            <afi>ipv4</afi>
                            <safi>unicast</safi>
                            <config>
                                <afi>ipv4</afi>
                                <safi>unicast</safi>
                                <activate />
                            </config>
                        </address-family>
                    </address-families>
                    <config>
                        <confederation-identifier>600</confederation-
identifier>
                        <peer-address>10.1.1.2</peer-address>
                        <peer-as>100</peer-as>
                        <peer-as-number>48</peer-as-number>
                    </config>
                </peer>
            </peers>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Validation with NetConf get

Here is a NetConf validation response indicates the successful validation of a network configuration specified in a NetConf payload. In this specific response, it verifies the correctness of the configuration for a specified network instance with associated protocols and interfaces. The validation ensures that the configuration adheres to the defined network instance types, policy types, and address families. All relevant elements, such as the BGP instance, its parameters, and the associated interfaces, are validated against the specified OpenConfig model.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <config>
      <name>default</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
    </config>
    <state>
```

```
      <name>default</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
    </state>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</identifier>
        <name>DIRECTLY_CONNECTED</name>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </config>
        <state>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </state>
      </protocol>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
                <state>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </state>
                <add-paths>
                  <config>
                    <receive>true</receive>
                    <send>true</send>
                    <send-max>2</send-max>
                  </config>
                  <state>
                    <receive>true</receive>
```

```
          <send>true</send>
          <send-max>2</send-max>
        </state>
      </add-paths>
      <use-multiple-paths>
        <ibgp>
          <config>
            <maximum-paths>7</maximum-paths>
          </config>
          <state>
            <maximum-paths>7</maximum-paths>
          </state>
        </ibgp>
      </use-multiple-paths>
    </afi-safi>
  </afi-safis>
  <confederation>
    <config>
      <member-as>48</member-as>
      <identifier>600</identifier>
    </config>
    <state>
      <member-as>48</member-as>
      <identifier>600</identifier>
    </state>
  </confederation>
  <config>
    <as>100</as>
    <router-id>1.2.3.4</router-id>
  </config>
  <route-selection-options>
    <config>
      <enable-aigp>false</enable-aigp>
      <ignore-as-path-length>true</ignore-as-path-length>
      <external-compare-router-id>true</external-compare-router-id>
    </config>
    <state>
      <enable-aigp>false</enable-aigp>
      <ignore-as-path-length>true</ignore-as-path-length>
      <external-compare-router-id>true</external-compare-router-id>
    </state>
  </route-selection-options>
  <state>
    <as>100</as>
    <router-id>1.2.3.4</router-id>
    <total-prefixes>0</total-prefixes>
  </state>
  <graceful-restart>
    <config>
      <restart-time>100</restart-time>
      <stale-routes-time>300.00</stale-routes-time>
      <helper-only>false</helper-only>
    </config>
    <state>
      <restart-time>100</restart-time>
      <stale-routes-time>300.00</stale-routes-time>
      <helper-only>false</helper-only>
```

```
              </state>
            </graceful-restart>
          </global>
          <neighbors>
            <neighbor>
              <neighbor-address>10.1.1.2</neighbor-address>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                  <state>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </state>
                </afi-safi>
              </afi-safis>
              <config>
                <enabled>true</enabled>
                <neighbor-address>10.1.1.2</neighbor-address>
                <peer-as>100</peer-as>
              </config>
              <state>
                <enabled>true</enabled>
                <neighbor-address>10.1.1.2</neighbor-address>
                <peer-as>100</peer-as>
              </state>
            </neighbor>
          </neighbors>
        </bgp>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>100</name>
          <enabled>true</enabled>
        </config>
        <state>
          <enabled>true</enabled>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>100</name>
        </state>
      </protocol>
    </protocols>
    <tables>
      <table>
        <protocol
```

```
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </state>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </state>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
```

```
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </state>
      </table>
    </tables>
    <interfaces>
      <interface>
        <id>eth0</id>
        <config>
          <id>eth0</id>
          <interface>eth0</interface>
        </config>
      </interface>
      <interface>
        <id>eth1</id>
        <config>
          <id>eth1</id>
          <interface>eth1</interface>
        </config>
      </interface>
      <interface>
        <id>eth2</id>
        <config>
          <id>eth2</id>
          <interface>eth2</interface>
        </config>
      </interface>
      <interface>
        <id>eth3</id>
        <config>
          <id>eth3</id>
          <interface>eth3</interface>
        </config>
      </interface>
      <interface>
        <id>eth4</id>
        <config>
          <id>eth4</id>
          <interface>eth4</interface>
        </config>
      </interface>
      <interface>
        <id>eth5</id>
        <config>
          <id>eth5</id>
          <interface>eth5</interface>
        </config>
      </interface>
      <interface>
        <id>eth6</id>
        <config>
```

```
            <id>eth6</id>
            <interface>eth6</interface>
          </config>
        </interface>
        <interface>
          <id>eth7</id>
          <config>
            <id>eth7</id>
            <interface>eth7</interface>
          </config>
        </interface>
        <interface>
          <id>eth8</id>
          <config>
            <id>eth8</id>
            <interface>eth8</interface>
          </config>
        </interface>
        <interface>
          <id>lo</id>
          <config>
            <id>lo</id>
            <interface>lo</interface>
          </config>
        </interface>
      </interfaces>
    </network-instance>
  </network-instances>
```

Restrictions

- On the first time `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global` paths are configured, those configuration need that respective **AFI-SAFI** configuration must be present to indicate **AFI** type:

  `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/afi-safis`

  This information is necessary for the OcNOS model to generate the following paths:

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/address-families`

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/peer-groups/peer-group/address-families`

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/address-family-vrfs`

- After the /`oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global` paths are configured on equipment, on the further configurations on those paths the user does not need to indicate the **AFI-SAFI**, the translation will look for this information on the equipment database.
- For multiple paths configuration, the Open Config path `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/use-multiple-paths` is not support, all the multiple paths configurations are done on Open Config path `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/afi-safis/afi-safi/use-multiple-paths`.This is because the OcNOS datamodel only handle multiple paths is one place.
- The containers `graceful-restart` and `route-selection-options` are configurable only by `network-instance` instance named “default”.

- The below OpenConfig attributes have their logic inverted, so a "false" value on OpenConfig means a "true" value on OcNOS datamodel

  `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/graceful-restart/state/helper-only`

  `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/route-selection-options/config/enable-aigp`

Create BGP Global with User-defined VRFs

This XML configuration snippet uses the payloads provided in this section to configure BGP Global with user-defined VRF data from the Open Config perspective.

The AFI-SAFI container must be available on the configuration applied to help configure address-families.

Release

This configuration was introduced in OcNOS version 6.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload used to configure network instances with BGP Global settings. This payload includes configuration for both the `default` network instance and a custom network instance named `red`.

In the `default` instance, BGP Global settings such as the AS number, router ID, route selection options, and graceful restart parameters are configured.

In the `red` network instance, in addition to the common BGP Global settings, specific **AFI-SAFI** settings are configured, including the number of maximum paths for both eBGP and iBGP. This example demonstrates how the payload can be adapted to configure different network instances with unique BGP configurations.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <config>
      <name>default</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
    </config>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</identifier>
        <name>DIRECTLY_CONNECTED</name>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </config>
      </protocol>
      <protocol>
```

```
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
              <router-id>1.2.3.4</router-id>
            </config>
            <route-selection-options>
              <config>
                <enable-aigp>false</enable-aigp>
                <ignore-as-path-length>true</ignore-as-path-length>
                <external-compare-router-id>true</external-compare-router-id>
              </config>
            </route-selection-options>
            <graceful-restart>
              <config>
                <restart-time>100</restart-time>
                <stale-routes-time>300.00</stale-routes-time>
                <helper-only>false</helper-only>
              </config>
            </graceful-restart>
          </global>
        </bgp>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>100</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
  <network-instance>
    <name>red</name>
    <config>
      <name>red</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
      <route-distinguisher>100:200</route-distinguisher>
    </config>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</identifier>
        <name>DIRECTLY_CONNECTED</name>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </config>
```

```
      </protocol>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
              <router-id>1.2.3.4</router-id>
            </config>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
                <use-multiple-paths>
                  <ebgp>
                    <config>
                      <maximum-paths>10</maximum-paths>
                    </config>
                  </ebgp>
                  <ibgp>
                    <config>
                      <maximum-paths>15</maximum-paths>
                    </config>
                  </ibgp>
                </use-multiple-paths>
              </afi-safi>
            </afi-safis>
            <confederation>
              <config>
                <member-as>48</member-as>
                <identifier>600</identifier>
              </config>
            </confederation>
          </global>
        </bgp>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>100</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI commands are used to configure an IP VRF with a route distinguisher. In addition, the router BGP is configured with various BGP settings, including router ID, bestpath options, graceful restart parameters, and confederation settings. Inside the address-family IPv4 VRF context, the maximum paths for eBGP and iBGP are set. The BGP confederation is also configured with an identifier and peers.

```
 ip vrf red
 rd 100:200
!
router bgp 100
 bgp router-id 1.2.3.4
 bgp confederation vrf red identifier 600
 bgp confederation vrf red peers 48
 bgp bestpath as-path ignore
 bgp bestpath aigp ignore
 bgp bestpath compare-routerid
 bgp graceful-restart restart-time 100
 bgp graceful-restart stalepath-time 300
 bgp graceful-restart graceful-reset
 !
 address-family ipv4 vrf red
 max-paths ebgp 10
 max-paths ibgp 15
 exit-address-family
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure a BGP instance with AS number, a router ID, and settings to ignore AIGP for bestpath selection. It also includes graceful restart parameters with a restart time and a stale path max retention time. Additionally, the payload configures route selection options to ignore AS path length and perform external comparisons based on router IDs. Inside the address-family VRF context for IPv4 unicast, it sets the confederation identifier and the peer AS number. Maximum path settings are configured for both eBGP and iBGP paths.

```
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>100</bgp-as>
            <config>
                <bgp-as>100</bgp-as>
                <router-id>1.2.3.4</router-id>
                <ignore-aigp-for-bestpath />
            </config>
            <confederation-vrfs>
              <confederation-vrf>
                <confed-vrf-name>red</confed-vrf-name>
                <config>
                  <confed-vrf-name>red</confed-vrf-name>
                  <identifier>600</identifier>
                  <peer-as-number>48</peer-as-number>
                </config>
              </confederation-vrf>
            </confederation-vrfs>
            <graceful-restart>
```

```
                <config>
                    <restart-time>100</restart-time>
                    <stale-path-max-retention-time>300</stale-path-max-
retention-time>
                    <graceful-reset />
                </config>
            </graceful-restart>
            <route-selection>
                <config>
                    <ignore-as-path-length />
                    <external-compare-router-id />
                </config>
            </route-selection>
            <address-family-vrfs>
                <address-family-vrf>
                    <afi>ipv4</afi>
                    <safi>unicast</safi>
                    <vrf-name>red</vrf-name>
                    <config>
                        <afi>ipv4</afi>
                        <safi>unicast</safi>
                        <vrf-name>red</vrf-name>
                    </config>
                    <maximum-paths>
                        <config>
                            <ebgp-max-path>10</ebgp-max-path>
                            <ibgp-max-path>15</ibgp-max-path>
                        </config>
                    </maximum-paths>
                </address-family-vrf>
            </address-family-vrfs>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Validation with NetConf get

Here is a NetConf validation response for configuring settings for the default network instance and a network instance. It also includes configurations for protocols, under network instances. Additionally, there are table configurations for IPv4 and IPv6 address families.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <config>
      <name>default</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
    </config>
    <state>
      <name>default</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
    </state>
    <protocols>
```

```
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</identifier>
        <name>DIRECTLY_CONNECTED</name>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </config>
        <state>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </state>
      </protocol>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
              <router-id>1.2.3.4</router-id>
            </config>
            <route-selection-options>
              <config>
                <enable-aigp>false</enable-aigp>
                <ignore-as-path-length>true</ignore-as-path-length>
                <external-compare-router-id>true</external-compare-router-id>
              </config>
              <state>
                <enable-aigp>false</enable-aigp>
                <ignore-as-path-length>true</ignore-as-path-length>
                <external-compare-router-id>true</external-compare-router-id>
              </state>
            </route-selection-options>
            <state>
              <as>100</as>
              <router-id>1.2.3.4</router-id>
              <total-prefixes>0</total-prefixes>
            </state>
            <graceful-restart>
              <config>
                <restart-time>100</restart-time>
                <stale-routes-time>300.00</stale-routes-time>
                <helper-only>false</helper-only>
              </config>
              <state>
                <restart-time>100</restart-time>
                <stale-routes-time>300.00</stale-routes-time>
```

```
                <helper-only>false</helper-only>
              </state>
            </graceful-restart>
          </global>
        </bgp>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>100</name>
          <enabled>true</enabled>
        </config>
        <state>
          <enabled>true</enabled>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>100</name>
        </state>
      </protocol>
    </protocols>
    <tables>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </state>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
```

```
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </state>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
      </table>
    </tables>
  </network-instance>
  <network-instance>
    <name>red</name>
    <config>
      <name>red</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
      <route-distinguisher>100:200</route-distinguisher>
    </config>
    <state>
      <name>red</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
      <route-distinguisher>100:200</route-distinguisher>
    </state>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</identifier>
        <name>DIRECTLY_CONNECTED</name>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </config>
```

```
        <state>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </state>
      </protocol>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
              <router-id>1.2.3.4</router-id>
            </config>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
                <state>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                </state>
                <use-multiple-paths>
                  <ebgp>
                    <config>
                      <maximum-paths>10</maximum-paths>
                    </config>
                    <state>
                      <maximum-paths>10</maximum-paths>
                    </state>
                  </ebgp>
                  <ibgp>
                    <config>
                      <maximum-paths>15</maximum-paths>
                    </config>
                    <state>
                      <maximum-paths>15</maximum-paths>
                    </state>
                  </ibgp>
                </use-multiple-paths>
              </afi-safi>
            </afi-safis>
            <confederation>
              <config>
                <member-as>48</member-as>
```

```
              <identifier>600</identifier>
            </config>
            <state>
              <member-as>48</member-as>
              <identifier>600</identifier>
            </state>
          </confederation>
          <state>
            <as>100</as>
            <router-id>1.2.3.4</router-id>
          </state>
        </global>
      </bgp>
      <config>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
        <name>100</name>
        <enabled>true</enabled>
      </config>
      <state>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
        <name>100</name>
        <enabled>true</enabled>
      </state>
    </protocol>
  </protocols>
  <tables>
    <table>
      <protocol
        xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
      <address-family
        xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
      <config>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
      </config>
      <state>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
      </state>
    </table>
    <table>
      <protocol
        xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
```

```
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </state>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </state>
      </table>
    </tables>
  </network-instance>
</network-instances>
```

Restrictions

- The `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/afi-safis/afi-safi/add-paths` are available only on `network-instance` instance named “default”.
- The container `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/graceful-restart` are available only on `network-instance` instance named “default”.
- The container `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/route-selection-options` are available only on `network-instance` instance named “default”.

- On the first time `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global` paths are configured, those configuration needs the respective **AFI-SAFI** configuration that be present to indicate **AFI** type: `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/afi-safis`

  The above information is necessary for the OcNOS model to generate the following paths:

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/address-families`

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/peer-groups/peer-group/address-families`

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/address-family-vrfs`

- After the `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global` paths are configured on equipment, on the further configurations on those paths the user does not need to indicate the **AFI-SAFI**, the translation will look for this information on the equipment database.

Create BGP Neighbors

This XML configuration snippet is used to configure neighbors in non-default VRF of BGP.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload to configure network instances, specifically two instances: `default` and `VRF1`. It also configures BGP settings within these network instances, including neighbors and address families. Additionally, it configures tables for IPv4 and IPv6 address families within the network instances.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
      <name>default</name>
      <config>
        <name>default</name>
        <type
          xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
      </config>
      <protocols>
        <protocol>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <config>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
            <name>DIRECTLY_CONNECTED</name>
            <enabled>true</enabled>
          </config>
        </protocol>
        <protocol>
          <identifier
```

```
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>123</name>
          <bgp>
            <global>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                </afi-safi>
              </afi-safis>
              <config>
                <as>123</as>
              </config>
            </global>
            <neighbors>
              <neighbor>
                <neighbor-address>10.1.1.1</neighbor-address>
                <afi-safis>
                  <afi-safi>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <ipv4-unicast>
                      <config>
                        <send-default-route>true</send-default-route>
                      </config>
                      <prefix-limit>
                        <config>
                          <max-prefixes>5</max-prefixes>
                          <warning-threshold-pct>60</warning-threshold-pct>
                        </config>
                      </prefix-limit>
                    </ipv4-unicast>
                    <config>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </config>
                    <graceful-restart>
                      <config>
                        <enabled>true</enabled>
                      </config>
                    </graceful-restart>
                  </afi-safi>
                </afi-safis>
                <config>
                  <enabled>true</enabled>
                  <remove-private-as
```

```
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:PRIVATE_AS_REMOVE_ALL</remove-private-as>
                  <neighbor-address>10.1.1.1</neighbor-address>
                  <peer-as>100</peer-as>
                  <local-as>300</local-as>
                </config>
                <enable-bfd>
                  <config>
                    <enabled>true</enabled>
                  </config>
                </enable-bfd>
                <transport>
                  <config>
                    <local-address>eth1</local-address>
                  </config>
                </transport>
                <timers>
                  <config>
                    <keepalive-interval>30.00</keepalive-interval>
                    <hold-time>120.00</hold-time>
                  </config>
                </timers>
                <ebgp-multihop>
                  <config>
                    <multihop-ttl>5</multihop-ttl>
                    <enabled>true</enabled>
                  </config>
                </ebgp-multihop>
              </neighbor>
              <neighbor>
                <neighbor-address>11.1.1.1</neighbor-address>
                <afi-safis>
                  <afi-safi>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <ipv4-unicast>
                      <prefix-limit>
                        <config>
                          <max-prefixes>7</max-prefixes>
                          <warning-threshold-pct>70</warning-threshold-pct>
                          <prevent-teardown>true</prevent-teardown>
                        </config>
                      </prefix-limit>
                    </ipv4-unicast>
                    <apply-policy>
                      <config>
                        <import-policy>rmap1</import-policy>
                        <export-policy>rmap1</export-policy>
                      </config>
                    </apply-policy>
                    <config>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </config>
```

```
                    <add-paths>
                      <config>
                        <receive>true</receive>
                        <send>true</send>
                      </config>
                    </add-paths>
                  </afi-safi>
                </afi-safis>
                <config>
                  <enabled>true</enabled>
                  <neighbor-address>11.1.1.1</neighbor-address>
                  <peer-as>123</peer-as>
                </config>
              </neighbor>
            </neighbors>
          </bgp>
          <config>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
            <name>123</name>
            <enabled>true</enabled>
          </config>
        </protocol>
      </protocols>
      <tables>
        <table>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
          <config>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
          </config>
        </table>
        <table>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
          <config>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
          </config>
        </table>
```

```
        <table>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
          <config>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
          </config>
        </table>
      </tables>
    </network-instance>
    <network-instance>
        <name>VRF1</name>
        <config>
            <name>VRF1</name>
            <type xmlns:oc-ni-types="http://openconfig.net/yang/network-
instance-types">oc-ni-types:L3VRF</type>
            <route-distinguisher>1.2.3.4:56</route-distinguisher>
        </config>
        <protocols>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                <name>DIRECTLY_CONNECTED</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                    <name>DIRECTLY_CONNECTED</name>
                    <enabled>true</enabled>
                </config>
            </protocol>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:BGP</identifier>
                <name>123</name>
                <bgp>
                    <global>
                        <config>
                            <as>123</as>
                        </config>
                    </global>
                    <neighbors>
                        <neighbor>
                            <neighbor-address>20.1.1.2</neighbor-address>
                            <afi-safis>
                                <afi-safi>
                                    <afi-safi-name xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                                    <config>
                                        <afi-safi-name xmlns:oc-bgp-
types="http://openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-
safi-name>
```

```
                                        <enabled>true</enabled>
                                      </config>
                                      <apply-policy>
                                        <config>
                                          <import-policy>rmap2</import-
policy>
                                          <export-policy>rmap2</export-
policy>
                                        </config>
                                      </apply-policy>
                                      <ipv4-unicast>
                                       <config>
                                         <send-default-route>true</send-default-
route>
                                      </config>
                                    </ipv4-unicast>
                                  </afi-safi>
                                </afi-safis>
                                <config>
                                    <neighbor-address>20.1.1.2</neighbor-address>
                                    <remove-private-as xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:PRIVATE_AS_REMOVE_ALL</remove-
private-as>
                                    <description>ebgp_VRF1</description>
                                    <local-as>300</local-as>
                                    <peer-as>200</peer-as>
                                </config>
                              </neighbor>
                              <neighbor>
                                <neighbor-address>21.1.1.2</neighbor-address>
                                <afi-safis>
                                  <afi-safi>
                                    <afi-safi-name
                                      xmlns:oc-bgp-types="http://openconfig.net/
yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                                    <ipv4-unicast>
                                      <prefix-limit>
                                        <config>
                                          <max-prefixes>5</max-prefixes>
                                          <warning-threshold-pct>80</warning-
threshold-pct>
                                          <prevent-teardown>true</prevent-teardown>
                                        </config>
                                      </prefix-limit>
                                    </ipv4-unicast>
                                    <config>
                                      <afi-safi-name
                                        xmlns:oc-bgp-types="http://openconfig.net/
yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                                      <enabled>true</enabled>
                                    </config>
                                    <graceful-restart>
                                      <config>
                                        <enabled>true</enabled>
                                      </config>
                                    </graceful-restart>
                                  </afi-safi>
                                </afi-safis>
```

```
                        <config>
                          <neighbor-address>21.1.1.2</neighbor-address>
                          <peer-as>123</peer-as>
                          <enabled>true</enabled>
                        </config>
                      </neighbor>
                    </neighbors>
                </bgp>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:BGP</identifier>
                    <name>123</name>
                    <enabled>true</enabled>
                </config>
            </protocol>
        </protocols>
        <tables>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV6</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV6</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:BGP</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:BGP</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
        </tables>
    </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI commands are used to configure a BGP setup with two address families: global `ipv4 unicast` and `ipv4 vrf VRF1`. It includes various neighbor configurations, prefix limits, route maps, and other BGP parameters to control BGP behavior in both the global and VRF contexts.

```
 ip vrf VRF1
 rd 100:200
exit
router bgp 123
 neighbor 10.1.1.1 remote-as 100
 neighbor 10.1.1.1 local-as 300
 neighbor 10.1.1.1 fall-over bfd
 neighbor 11.1.1.1 remote-as 123
 neighbor 10.1.1.1 ebgp-multihop 5
 neighbor 10.1.1.1 update-source eth1
 neighbor 10.1.1.1 timers 30 120
 !
 address-family ipv4 unicast
 neighbor 10.1.1.1 activate
 neighbor 10.1.1.1 remove-private-AS
 neighbor 10.1.1.1 maximum-prefix 5 60
 neighbor 10.1.1.1 capability graceful-restart
 neighbor 10.1.1.1 default-originate
 neighbor 11.1.1.1 activate
 neighbor 11.1.1.1 additional-paths send-receive
 neighbor 11.1.1.1 maximum-prefix 7 70 warning-only
 neighbor 11.1.1.1 route-map rmap1 in
 neighbor 11.1.1.1 route-map rmap1 out
 exit-address-family
 !
 address-family ipv4 vrf VRF1
 neighbor 20.1.1.2 remote-as 200
 neighbor 20.1.1.2 local-as 300
 neighbor 20.1.1.2 activate
 neighbor 20.1.1.2 remove-private-AS
 neighbor 20.1.1.2 route-map rmap2 in
 neighbor 20.1.1.2 route-map rmap2 out
 neighbor 20.1.1.2 default-originate
 neighbor 21.1.1.2 remote-as 123
 neighbor 21.1.1.2 activate
 neighbor 21.1.1.2 maximum-prefix 5 80 warning-only
 neighbor 21.1.1.2 capability graceful-restart
 neighbor 20.1.1.2 description ebgp_VRF1
 exit-address-family
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure BGP settings with VRF support and address-families in an OcNOS network device using the IPI YANG models. It defines BGP peering relationships, specify BGP attributes, and apply route maps within the context of both the global BGP instance and the VRF `VRF1`.

```
<network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">
    <network-instance>
```

```
        <instance-name>VRF1</instance-name>
        <instance-type>vrf</instance-type>
        <config>
            <instance-name>VRF1</instance-name>
            <instance-type>vrf</instance-type>
        </config>
        <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
            <config>
                <vrf-name>VRF1</vrf-name>
            </config>
            <bgp-vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp-vrf">
                <config>
                    <rd-string>100:200</rd-string>
                </config>
            </bgp-vrf>
        </vrf>
    </network-instance>
</network-instances>
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>123</bgp-as>
            <config>
                <bgp-as>123</bgp-as>
            </config>
            <address-families>
                <address-family>
                    <afi>ipv4</afi>
                    <safi>unicast</safi>
                    <config>
                        <afi>ipv4</afi>
                        <safi>unicast</safi>
                    </config>
                </address-family>
            </address-families>
            <peers>
                <peer>
                    <peer-address>10.1.1.1</peer-address>
                    <address-families>
                        <address-family>
                            <afi>ipv4</afi>
                            <safi>unicast</safi>
                            <maximum-prefixes>
                                <prefix-count>5</prefix-count>
                                <config>
                                    <prefix-count>5</prefix-count>
                                    <threshold-percentage>60</threshold-
percentage>
                                </config>
                            </maximum-prefixes>
                            <config>
                                <afi>ipv4</afi>
                                <safi>unicast</safi>
                                <activate />
                                <peer-remove-private-as />
                                <capability-graceful-restart />
                                <default-peer-route-map-name />
```

```
                            </config>
                        </address-family>
                    </address-families>
                    <config>
                        <peer-address>10.1.1.1</peer-address>
                        <peer-as>100</peer-as>
                        <enable-peer-bfd />
                        <peer-local-as>300</peer-local-as>
                        <source-identifier>eth1</source-identifier>
                    </config>
                    <timers>
                        <config>
                            <keep-alive>30</keep-alive>
                            <hold-time>120</hold-time>
                        </config>
                    </timers>
                    <ebgp-multihop>
                        <config>
                            <maximum-hop-count>5</maximum-hop-count>
                            <enabled />
                        </config>
                    </ebgp-multihop>
                </peer>
                <peer>
                    <peer-address>11.1.1.1</peer-address>
                    <address-families>
                        <address-family>
                            <afi>ipv4</afi>
                            <safi>unicast</safi>
                            <maximum-prefixes>
                                <maximum-prefix>
                                    <prefix-count>7</prefix-count>
                                    <config>
                                        <prefix-count>7</prefix-count>
                                        <threshold-percentage>70</threshold-
percentage>
                                        <warning-only />
                                    </config>
                                </maximum-prefix>
                            </maximum-prefixes>
                            <route-map-filters>
                                <route-map-filter>
                                    <route-map-direction>in</route-map-
direction>
                                    <config>
                                        <route-map-direction>in</route-map-
direction>
                                        <route-map-name>rmap1</route-map-name>
                                    </config>
                                </route-map-filter>
                                <route-map-filter>
                                    <route-map-direction>out</route-map-
direction>
                                    <config>
                                        <route-map-direction>out</route-map-
direction>
                                        <route-map-name>rmap1</route-map-name>
                                    </config>
```

```
                                </route-map-filter>
                            </route-map-filters>
                            <config>
                                <afi>ipv4</afi>
                                <safi>unicast</safi>
                                <additional-paths-mode>receive send</
additional-paths-mode>
                                <activate />
                            </config>
                        </address-family>
                    </address-families>
                    <config>
                        <peer-address>11.1.1.1</peer-address>
                        <peer-as>123</peer-as>
                    </config>
                </peer>
            </peers>
            <address-family-vrfs>
                <address-family-vrf>
                    <afi>ipv4</afi>
                    <safi>unicast</safi>
                    <vrf-name>VRF1</vrf-name>
                    <vrf-peers>
                        <vrf-peer>
                            <peer-address>20.1.1.2</peer-address>
                            <route-map-filters>
                                <route-map-filter>
                                    <route-map-direction>in</route-map-
direction>
                                    <config>
                                        <route-map-direction>in</route-map-
direction>
                                        <route-map-name>rmap2</route-map-name>
                                    </config>
                                </route-map-filter>
                                <route-map-filter>
                                    <route-map-direction>out</route-map-
direction>
                                    <config>
                                        <route-map-direction>out</route-map-
direction>
                                        <route-map-name>rmap2</route-map-name>
                                    </config>
                                </route-map-filter>
                            </route-map-filters>
                            <config>
                                <peer-address>20.1.1.2</peer-address>
                                <peer-as>200</peer-as>
                                <peer-local-as>300</peer-local-as>
                                <activate />
                                <peer-remove-private-as />
                                <default-peer-route-map-name />
                            </config>
                        </vrf-peer>
                        <vrf-peer>
                            <peer-address>21.1.1.2</peer-address>
                            <maximum-prefixes>
                                <maximum-prefix>
```

```
                                    <prefix-count>5</prefix-count>
                                    <config>
                                        <prefix-count>5</prefix-count>
                                        <threshold-percentage>80</threshold-
percentage>
                                        <warning-only />
                                    </config>
                                </maximum-prefix>
                            </maximum-prefixes>
                            <config>
                                <peer-address>21.1.1.2</peer-address>
                                <peer-as>123</peer-as>
                                <activate />
                                <capability-graceful-restart />
                            </config>
                        </vrf-peer>
                    </vrf-peers>
                    <config>
                        <afi>ipv4</afi>
                        <safi>unicast</safi>
                        <vrf-name>VRF1</vrf-name>
                    </config>
                </address-family-vrf>
            </address-family-vrfs>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Validation with NetConf get

Here is a NetConf validation response to configure payload for BGP settings in a network instance, including global BGP settings and BGP neighbors.

```
        <network-instances xmlns="http://openconfig.net/yang/network-
instance">
      <network-instance>
        <name>default</name>
        <protocols>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
            <name>123</name>
            <bgp>
              <global>
                <config>
                  <as>123</as>
                </config>
                <afi-safis>
                  <afi-safi>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <config>
                      <afi-safi-name
```

```
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </config>
                  </afi-safi>
                </afi-safis>
              </global>
              <neighbors>
                <neighbor>
                  <neighbor-address>10.1.1.1</neighbor-address>
                  <afi-safis>
                    <afi-safi>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <ipv4-unicast>
                        <config>
                          <send-default-route>true</send-default-route>
                        </config>
                        <prefix-limit>
                          <config>
                            <max-prefixes>5</max-prefixes>
                            <warning-threshold-pct>60</warning-threshold-pct>
                          </config>
                        </prefix-limit>
                      </ipv4-unicast>
                      <config>
                        <afi-safi-name
                          xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                        <enabled>true</enabled>
                      </config>
                      <graceful-restart>
                        <config>
                          <enabled>true</enabled>
                        </config>
                      </graceful-restart>
                    </afi-safi>
                  </afi-safis>
                  <config>
                    <enabled>true</enabled>
                    <neighbor-address>10.1.1.1</neighbor-address>
                    <peer-as>100</peer-as>
                    <local-as>300</local-as>
                    <remove-private-as
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:PRIVATE_AS_REMOVE_ALL</remove-private-as>
                  </config>
                  <enable-bfd>
                    <config>
                      <enabled>true</enabled>
                    </config>
                  </enable-bfd>
                  <ebgp-multihop>
                    <config>
                      <enabled>true</enabled>
                      <multihop-ttl>5</multihop-ttl>
```

```
                    </config>
                  </ebgp-multihop>
                  <transport>
                    <config>
                      <local-address>eth1</local-address>
                    </config>
                  </transport>
                  <timers>
                    <config>
                      <keepalive-interval>30.00</keepalive-interval>
                      <hold-time>120.00</hold-time>
                    </config>
                  </timers>
                </neighbor>
                <neighbor>
                  <neighbor-address>11.1.1.1</neighbor-address>
                  <afi-safis>
                    <afi-safi>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <ipv4-unicast>
                        <prefix-limit>
                          <config>
                            <max-prefixes>7</max-prefixes>
                            <warning-threshold-pct>70</warning-threshold-pct>
                            <prevent-teardown>true</prevent-teardown>
                          </config>
                        </prefix-limit>
                      </ipv4-unicast>
                      <apply-policy>
                        <config>
                          <import-policy>rmap1</import-policy>
                          <export-policy>rmap1</export-policy>
                        </config>
                      </apply-policy>
                      <config>
                        <afi-safi-name
                          xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                        <enabled>true</enabled>
                      </config>
                      <add-paths>
                        <config>
                          <receive>true</receive>
                          <send>true</send>
                        </config>
                      </add-paths>
                    </afi-safi>
                  </afi-safis>
                  <config>
                    <enabled>true</enabled>
                    <neighbor-address>11.1.1.1</neighbor-address>
                    <peer-as>123</peer-as>
                  </config>
                </neighbor>
              </neighbors>
```

```
            </bgp>
          </protocol>
        </protocols>
      </network-instance>
      <network-instance>
        <name>management</name>
      </network-instance>
      <network-instance>
        <name>VRF1</name>
        <protocols>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
            <name>123</name>
            <bgp>
              <global>
                <config>
                  <as>123</as>
                </config>
                <afi-safis>
                  <afi-safi>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <config>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </config>
                  </afi-safi>
                </afi-safis>
              </global>
              <neighbors>
                <neighbor>
                  <neighbor-address>20.1.1.2</neighbor-address>
                  <afi-safis>
                    <afi-safi>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <apply-policy>
                        <config>
                          <import-policy>rmap2</import-policy>
                          <export-policy>rmap2</export-policy>
                        </config>
                      </apply-policy>
                      <ipv4-unicast>
                        <config>
                          <send-default-route>true</send-default-route>
                        </config>
                      </ipv4-unicast>
                      <config>
                        <afi-safi-name
                          xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                        <enabled>true</enabled>
```

```
                    </config>
                  </afi-safi>
                </afi-safis>
                <apply-policy>
                  <config>
                    <import-policy>rmap2</import-policy>
                    <export-policy>rmap2</export-policy>
                  </config>
                </apply-policy>
                <config>
                  <neighbor-address>20.1.1.2</neighbor-address>
                  <peer-as>200</peer-as>
                  <local-as>300</local-as>
                  <enabled>true</enabled>
                  <remove-private-as
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:PRIVATE_AS_REMOVE_ALL</remove-private-as>
                </config>
              </neighbor>
              <neighbor>
                <neighbor-address>21.1.1.2</neighbor-address>
                <afi-safis>
                  <afi-safi>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <ipv4-unicast>
                      <prefix-limit>
                        <config>
                          <max-prefixes>5</max-prefixes>
                          <warning-threshold-pct>80</warning-threshold-pct>
                          <prevent-teardown>true</prevent-teardown>
                        </config>
                      </prefix-limit>
                    </ipv4-unicast>
                    <config>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </config>
                    <graceful-restart>
                      <config>
                        <enabled>true</enabled>
                      </config>
                    </graceful-restart>
                  </afi-safi>
                </afi-safis>
                <config>
                  <neighbor-address>21.1.1.2</neighbor-address>
                  <peer-as>123</peer-as>
                  <enabled>true</enabled>
                </config>
              </neighbor>
            </neighbors>
          </bgp>
        </protocol>
```

```
      </protocols>
    </network-instance>
  </network-instances>
```

Restrictions

- The leaf `/network-instances/network-instance/protocols/protocol/bgp/neighbors/neighbor/config/remove-private-as` must have the OpenConfig value `PRIVATE_AS_REMOVE_ALL`
- The below leaf was not supported by the current implementation, but this feature is supported at the **AFI-SAFI** level of each neighbor.

  `/network-instances/network-instance/protocols/protocol/bgp/neighbors/neighbor/apply-policy`
- The below leaf was not supported by the current implementation at the neighbor level, but this feature is supported at the **AFI-SAFI** level of each neighbor, as well as at the global level (`/network-instances/network-instance/protocols/protocol/bgp/global/graceful-restart`).

  `/network-instances/network-instance/protocols/protocol/bgp/neighbors/neighbor/graceful-restart`
- The below leaf was not supported by the current implementation at the neighbor level, but this feature is supported at the global level (`/network-instances/network-instance/protocols/protocol/bgp/global/afi-safis/afi-safi/use-multiple-paths`).

  `/network-instances/network-instance/protocols/protocol/bgp/neighbors/neighbor/use-multiple-paths`
- The below leaf is limited to 32 characters and must have the format `<interface>.<subinterface>`, `e.g., eth2.10`.

  `/network-instances/network-instance/interfaces/interface/config/id`
- On the first time `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbor` paths are configured, those configuration needs the respective **AFI-SAFI** configuration that be present to indicate **AFI** type:

  `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors/neighbor/afi-safis`

  The above information is necessary for the OcNOS model to generate the following paths:

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/address-families`

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/peer-groups/peer-group/address-families`

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/address-family-vrfs`
- After the `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors` paths are configured on equipment, on the further configurations on those paths the user does not need to indicate the AFI-SAFI, the translation will look for this information on the equipment database.
- Sending `operation=delete` to an `afi-safi` of a neighbor does not remove it from the configuration, instead, that address-family is deactivated.
  - OcNOS datamodel and CLI do not support the deletion of address-family of a peer. This is achieved in OcNOS by deleting the activate status of a peer address-family.

Configure eBGP Neighbor with TTL

This XML configuration snippet defines the eBGP neighbor with a Time-to-Live (TTL) value.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload that defines a network instance named `VRF1` with various configurations, including the route distinguisher, protocols, and tables. Specifically, it sets up BGP protocol with a global AS number and a neighbor with an AS number. The eBGP-multihop feature is enabled for this neighbor with a TTL value.

Additionally, the payload defines three tables, one for directly connected IPv4 routes, one for directly connected IPv6 routes, and one for BGP IPv4 routes.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
        <name>VRF1</name>
        <config>
            <name>VRF1</name>
            <type xmlns:oc-ni-types="http://openconfig.net/yang/network-
instance-types">oc-ni-types:L3VRF</type>
            <route-distinguisher>1.2.3.4:56</route-distinguisher>
        </config>
        <protocols>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                <name>DIRECTLY_CONNECTED</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                    <name>DIRECTLY_CONNECTED</name>
                    <enabled>true</enabled>
                </config>
            </protocol>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:BGP</identifier>
                <name>100</name>
                <bgp>
                    <global>
                        <config>
                            <as>100</as>
                        </config>
                    </global>
                    <neighbors>
                        <neighbor>
                            <neighbor-address>1.1.1.2</neighbor-address>
                            <afi-safis>
                                <afi-safi>
                                    <afi-safi-name xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                                    <config>
                                        <afi-safi-name xmlns:oc-bgp-
types="http://openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-
safi-name>
                                        <enabled>true</enabled>
```

```
                                    </config>
                                </afi-safi>
                            </afi-safis>
                            <config>
                                <neighbor-address>1.1.1.2</neighbor-address>
                                <peer-as>200</peer-as>
                            </config>
                            <ebgp-multihop>
                                <config>
                                    <enabled>true</enabled>
                                    <multihop-ttl>20</multihop-ttl>
                                </config>
                            </ebgp-multihop>
                        </neighbor>
                    </neighbors>
                </bgp>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:BGP</identifier>
                    <name>100</name>
                    <enabled>true</enabled>
                </config>
            </protocol>
        </protocols>
        <tables>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV6</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV6</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:BGP</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:BGP</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
```

```
                </config>
            </table>
        </tables>
    </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI commands are used to configure a BGP neighbor relationship in the `VRF1`, allowing the BGP router with AS number 100 to communicate with a neighbor at IP address 1.1.1.2, which has AS number 200, and the configuration ensures that the session can be established even if the TTL is set to a higher value, in this case, 20.

```
router bgp 100
!
address-family ipv4 vrf VRF1
neighbor 1.1.1.2 remote-as 200
neighbor 1.1.1.2 activate
neighbor 1.1.1.2 ebgp-multihop 20
exit-address-family
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload that defines a VRF instance named `VRF1` with the associated BGP settings. The VRF is set to use IPv4 unicast address-family. Within this VRF, a BGP peering session is established with a remote neighbor having the IP address 1.1.1.2 and AS number 200. To ensure the BGP session can be established, the `ebgp-multihop` feature is enabled with a maximum hop count of 20, allowing the BGP router to communicate with a neighbor that might be multiple hops away. The BGP configuration also specifies a route distinguisher (RD) of `1.2.3.4:56` for the VRF. This configuration is essential for routing and forwarding traffic within the VRF while maintaining isolation from other VRFs or the global routing table.

```
<network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">
    <network-instance>
        <instance-name>VRF1</instance-name>
        <instance-type>vrf</instance-type>
        <config>
            <instance-name>VRF1</instance-name>
            <instance-type>vrf</instance-type>
        </config>
        <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
            <config>
                <vrf-name>VRF1</vrf-name>
            </config>
            <bgp-vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp-vrf">
                <config>
                    <rd-string>1.2.3.4:56</rd-string>
                </config>
            </bgp-vrf>
        </vrf>
    </network-instance>
</network-instances>
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
```

```
            <bgp-as>100</bgp-as>
            <config>
                <bgp-as>100</bgp-as>
            </config>
            <address-family-vrfs>
                <address-family-vrf>
                    <afi>ipv4</afi>
                    <safi>unicast</safi>
                    <vrf-name>VRF1</vrf-name>
                    <vrf-peers>
                        <vrf-peer>
                            <peer-address>1.1.1.2</peer-address>
                            <config>
                                <peer-address>1.1.1.2</peer-address>
                                <peer-as>200</peer-as>
                            </config>
                            <ebgp-multihop>
                                <config>
                                    <maximum-hop-count>20</maximum-hop-count>
                                    </enabled>
                                </config>
                            </ebgp-multihop>
                        </vrf-peer>
                    </vrf-peers>
                    <config>
                        <afi>ipv4</afi>
                        <safi>unicast</safi>
                        <vrf-name>VRF1</vrf-name>
                    </config>
                </address-family-vrf>
            </address-family-vrfs>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Validation with NetConf get

Here is a NetConf validation response for the network instance `VRF1` and its associated BGP settings indicates that the provided configuration is compliant with the expected structure and format defined in the YANG data model for network instances and BGP protocols. This validation response affirms that there are no errors or inconsistencies in the configuration, affirming its readiness for application to the network device. It verifies that the specified parameters, such as route distinguisher, autonomous system numbers, and address families, are correctly defined and align with the defined standards, ensuring smooth and accurate operation within the network infrastructure.

```
        <network-instances xmlns="http://openconfig.net/yang/network-
instance">
      <network-instance>
        <name>VRF1</name>
        <config>
          <name>VRF1</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
          <route-distinguisher>1.2.3.4:56</route-distinguisher>
        </config>
        <state>
          <name>VRF1</name>
```

```
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
          <route-distinguisher>1.2.3.4:56</route-distinguisher>
        </state>
        <protocols>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
            <name>DIRECTLY_CONNECTED</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
              <name>DIRECTLY_CONNECTED</name>
              <enabled>true</enabled>
            </config>
            <state>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
              <name>DIRECTLY_CONNECTED</name>
              <enabled>true</enabled>
            </state>
          </protocol>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
            <name>100</name>
            <bgp>
              <global>
                <config>
                  <as>100</as>
                </config>
                <state>
                  <as>100</as>
                </state>
              </global>
              <neighbors>
                <neighbor>
                  <neighbor-address>1.1.1.2</neighbor-address>
                  <afi-safis>
                    <afi-safi>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <config>
                        <afi-safi-name
                          xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                        <enabled>true</enabled>
                      </config>
                    </afi-safi>
                  </afi-safis>
                  <config>
                    <neighbor-address>1.1.1.2</neighbor-address>
```

```
                    <peer-as>200</peer-as>
                    <enabled>true</enabled>
                  </config>
                  <ebgp-multihop>
                    <config>
                      <enabled>true</enabled>
                      <multihop-ttl>20</multihop-ttl>
                    </config>
                    <state>
                      <enabled>true</enabled>
                      <multihop-ttl>20</multihop-ttl>
                    </state>
                  </ebgp-multihop>
                  <state>
                    <neighbor-address>1.1.1.2</neighbor-address>
                    <peer-as>200</peer-as>
                    <enabled>true</enabled>
                  </state>
                </neighbor>
              </neighbors>
            </bgp>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:BGP</identifier>
              <name>100</name>
              <enabled>true</enabled>
            </config>
            <state>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:BGP</identifier>
              <name>100</name>
              <enabled>true</enabled>
            </state>
          </protocol>
        </protocols>
        <tables>
          <table>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
            <config>
              <protocol
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:BGP</protocol>
              <address-family
                xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV4</address-family>
            </config>
          </table>
        </tables>
      </network-instance>
    </network-instances>
```

Restrictions

- The leaf `/network-instances/network-instance/protocols/protocol/bgp/neighbors/neighbor/config/peer-type` is not supported.
- On the first time `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbor` paths are configured, those configuration needs the respective **AFI-SAFI** configuration that be present to indicate **AFI** type `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors/neighbor/afi-safis`

  The above information is necessary for the OcNOS model to generate the following paths:

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/address-families`

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/peer-groups/peer-group/address-families`

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/address-family-vrfs`
- After the `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors` paths are configured on equipment, on the further config urations on those paths the user does not need to indicate the **AFI-SAFI**, the translation will look for this information on the equipment database.

Create BGP Peer-groups with Default VRF

This XML configuration snippet is used to specify that BGP peer-groups should be created within the default VRF. Peer groups are configurations that can be used elsewhere without the need to repeat them.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload to configure BGP settings within the `default` network instance. It defines various BGP parameters and peer groups for the specified `AFI-SAFI` combinations, including IPv4 unicast, IPv4 labeled unicast, IPv6 labeled unicast, and L3VPN IPv6 unicast. This configuration includes authentication passwords, timers, route reflector settings, and more for different peer groups such as `ABC`, `peer1`, and `peer2`.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
            </config>
            <route-selection-options>
              <config>
                <enable-aigp>true</enable-aigp>
              </config>
```

```
              <state>
                <enable-aigp>true</enable-aigp>
              </state>
            </route-selection-options>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
              </afi-safi>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_LABELED_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_LABELED_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
              </afi-safi>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_LABELED_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_LABELED_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
              </afi-safi>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:L3VPN_IPV6_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:L3VPN_IPV6_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
              </afi-safi>
            </afi-safis>
          </global>
          <peer-groups>
            <peer-group>
              <peer-group-name>ABC</peer-group-name>
              <config>
                <auth-password>0x9603e78694ace534ea912b9ab53f8a55</auth-
password>
                <peer-group-name>ABC</peer-group-name>
```

```
                <peer-as>100</peer-as>
                <description>Non VRF peer-group configs</description>
              </config>
              <enable-bfd>
                <config>
                  <enabled>true</enabled>
                </config>
              </enable-bfd>
              <timers>
                <config>
                  <connect-retry>300.00</connect-retry>
                  <minimum-advertisement-interval>20.00</minimum-
advertisement-interval>
                  <keepalive-interval>300.00</keepalive-interval>
                  <hold-time>8200.00</hold-time>
                </config>
              </timers>
              <transport>
                <config>
                  <local-address>10.1.1.1</local-address>
                  <passive-mode>true</passive-mode>
                </config>
              </transport>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <ipv4-unicast>
                    <prefix-limit>
                      <config>
                        <max-prefixes>4294967295</max-prefixes>
                        <warning-threshold-pct>100</warning-threshold-pct>
                        <prevent-teardown>true</prevent-teardown>
                      </config>
                    </prefix-limit>
                    <config>
                      <send-default-route>true</send-default-route>
                    </config>
                  </ipv4-unicast>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                  <apply-policy>
                    <config>
                      <import-policy>in-map</import-policy>
                      <export-policy>out-map</export-policy>
                    </config>
                  </apply-policy>
                </afi-safi>
              </afi-safis>
              <route-reflector>
                <config>
                  <route-reflector-client>true</route-reflector-client>
```

```
                </config>
              </route-reflector>
            </peer-group>
            <peer-group>
              <peer-group-name>peer1</peer-group-name>
              <config>
                <auth-password>0x9a20ef22549ad84b</auth-password>
                <peer-group-name>peer1</peer-group-name>
                <peer-as>200</peer-as>
              </config>
              <ebgp-multihop>
                <config>
                  <enabled>true</enabled>
                </config>
              </ebgp-multihop>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_LABELED_UNICAST</afi-safi-name>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_LABELED_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                </afi-safi>
              </afi-safis>
            </peer-group>
            <peer-group>
              <peer-group-name>peer2</peer-group-name>
              <config>
                <auth-password>0x9603e78694ace534e74f24019f5bfeb5</auth-
password>
                <peer-group-name>peer2</peer-group-name>
                <peer-as>300</peer-as>
              </config>
              <enable-bfd>
                <config>
                  <enabled>true</enabled>
                </config>
              </enable-bfd>
              <ebgp-multihop>
                <config>
                  <multihop-ttl>10</multihop-ttl>
                  <enabled>true</enabled>
                </config>
              </ebgp-multihop>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_LABELED_UNICAST</afi-safi-name>
                  <ipv6-labeled-unicast>
                    <prefix-limit>
                      <config>
                        <max-prefixes>1</max-prefixes>
```

```
                        <prevent-teardown>true</prevent-teardown>
                      </config>
                    </prefix-limit>
                  </ipv6-labeled-unicast>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_LABELED_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                </afi-safi>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:L3VPN_IPV6_UNICAST</afi-safi-name>
                  <l3vpn-ipv6-unicast>
                    <prefix-limit>
                      <config>
                        <max-prefixes>12345</max-prefixes>
                      </config>
                    </prefix-limit>
                  </l3vpn-ipv6-unicast>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:L3VPN_IPV6_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                </afi-safi>
              </afi-safis>
            </peer-group>
          </peer-groups>
        </bgp>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI commands configure various BGP parameters and policies for different neighbors and address families within AS number 100.

```
 !
router bgp 100
 neighbor ABC peer-group
 neighbor ABC remote-as 100
 neighbor ABC fall-over bfd multihop
 neighbor peer1 peer-group
 neighbor peer1 remote-as 200
 neighbor peer2 peer-group
 neighbor peer2 remote-as 300
 neighbor peer2 fall-over bfd
 neighbor ABC description Non VRF peer-group configs
 neighbor ABC passive
 neighbor ABC update-source 10.1.1.1
 neighbor ABC authentication-key 0x9603e78694ace534ea912b9ab53f8a55
```

```
 neighbor ABC advertisement-interval 20
 neighbor ABC timers 300 8200
 neighbor ABC timers connect 300
 neighbor peer1 ebgp-multihop
 neighbor peer1 authentication-key 0x9a20ef22549ad84b
 neighbor peer2 ebgp-multihop 10
 neighbor peer2 authentication-key 0x9603e78694ace534e74f24019f5bfeb5
 !
 address-family ipv4 unicast
 neighbor ABC activate
 neighbor ABC route-reflector-client
 neighbor ABC default-originate
 neighbor ABC maximum-prefix 4294967295 100 warning-only
 neighbor ABC route-map in-map in
 neighbor ABC route-map out-map out
 exit-address-family
 !
 address-family ipv4 labeled-unicast
 neighbor peer1 activate
 exit-address-family
 !
 address-family vpnv6 unicast
 neighbor peer2 allow-ebgp-vpn
 neighbor peer2 activate
 neighbor peer2 maximum-prefix 12345
 exit-address-family
 !
 address-family ipv6 labeled-unicast
 neighbor peer2 activate
 neighbor peer2 maximum-prefix 1 warning-only
 exit-address-family
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to set up BGP peering and routing policies within the given AS number (100) and defines parameters for various address families and peer groups.

```
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>100</bgp-as>
            <config>
                <bgp-as>100</bgp-as>
            </config>
            <state>
                <bgp-as>100</bgp-as>
                <version>4</version>
                <table-version>1</table-version>
                <total-prefixes>0</total-prefixes>
                <router-run-time-ip-address>0.0.0.0</router-run-time-ip-
address>
                <scan-remain-time>49</scan-remain-time>
            </state>
            <rib>
                <address-family>
                    <safi>link-state</safi>
```

```
            <afi>link-state</afi>
            <state>
                <safi>link-state</safi>
                <afi>link-state</afi>
            </state>
        </address-family>
    </rib>
    <address-families>
        <address-family>
            <afi>ipv4</afi>
            <safi>unicast</safi>
            <config>
                <afi>ipv4</afi>
                <safi>unicast</safi>
            </config>
            <state>
                <afi>ipv4</afi>
                <safi>unicast</safi>
            </state>
        </address-family>
        <address-family>
            <afi>ipv4</afi>
            <safi>labeled-unicast</safi>
            <config>
                <afi>ipv4</afi>
                <safi>labeled-unicast</safi>
            </config>
            <state>
                <afi>ipv4</afi>
                <safi>labeled-unicast</safi>
            </state>
        </address-family>
        <address-family>
            <afi>ipv6</afi>
            <safi>labeled-unicast</safi>
            <config>
                <afi>ipv6</afi>
                <safi>labeled-unicast</safi>
            </config>
            <state>
                <afi>ipv6</afi>
                <safi>labeled-unicast</safi>
            </state>
        </address-family>
        <address-family>
            <afi>ipv6</afi>
            <safi>vpn-unicast</safi>
            <config>
                <afi>ipv6</afi>
                <safi>vpn-unicast</safi>
            </config>
            <state>
                <afi>ipv6</afi>
                <safi>vpn-unicast</safi>
            </state>
        </address-family>
    </address-families>
```

```
            <peer-groups>
                <peer-group>
                    <peer-group-tag>ABC</peer-group-tag>
                    <bgp-passwords>
                        <bgp-password>
                            <password>0x9603e78694ace534ea912b9ab53f8a55</
password>
                            <config>
                                <password>0x9603e78694ace534ea912b9ab53f8a55</
password>
                                <auth-key-encrypt>1</auth-key-encrypt>
                            </config>
                            <state>
                                <password>0x9603e78694ace534ea912b9ab53f8a55</
password>
                                <auth-key-encrypt>1</auth-key-encrypt>
                            </state>
                        </bgp-password>
                    </bgp-passwords>
                    <config>
                        <peer-group-tag>ABC</peer-group-tag>
                        <peer-group-range>static</peer-group-range>
                        <peer-as>100</peer-as>
                        <enable-peer-bfd />
                        <enable-peer-bfd-multihop />
                        <peer-description>Non VRF peer-group configs</peer-
description>
                        <peer-connect-interval>300</peer-connect-interval>
                        <min-route-advertisement-interval>20</min-route-
advertisement-interval>
                        <source-identifier>10.1.1.1</source-identifier>
                        <neighbor-passive />
                    </config>
                    <state>
                        <peer-group-tag>ABC</peer-group-tag>
                        <peer-group-range>static</peer-group-range>
                        <peer-as>100</peer-as>
                        <enable-peer-bfd />
                        <enable-peer-bfd-multihop />
                        <peer-description>Non VRF peer-group configs</peer-
description>
                        <peer-connect-interval>300</peer-connect-interval>
                        <min-route-advertisement-interval>20</min-route-
advertisement-interval>
                        <source-identifier>10.1.1.1</source-identifier>
                        <neighbor-passive />
                    </state>
                    <timers>
                        <config>
                            <keep-alive>300</keep-alive>
                            <hold-time>8200</hold-time>
                        </config>
                        <state>
                            <keep-alive>300</keep-alive>
                            <hold-time>8200</hold-time>
                        </state>
                    </timers>
                    <address-families>
```

```
                        <address-family>
                            <afi>ipv4</afi>
                            <safi>unicast</safi>
                            <maximum-prefixes>
                                <maximum-prefix>
                                    <prefix-count>4294967295</prefix-count>
                                    <config>
                                        <prefix-count>4294967295</prefix-
count>
                                        <threshold-percentage>100</threshold-
percentage>
                                        <warning-only />
                                    </config>
                                    <state>
                                        <prefix-count>4294967295</prefix-
count>
                                        <threshold-percentage>100</threshold-
percentage>
                                        <warning-only />
                                    </state>
                                </maximum-prefix>
                            </maximum-prefixes>
                            <config>
                                <afi>ipv4</afi>
                                <safi>unicast</safi>
                                <activate />
                                <default-peer-route-map-name />
                                <peer-route-reflector />
                            </config>
                            <state>
                                <afi>ipv4</afi>
                                <safi>unicast</safi>
                                <activate />
                                <default-peer-route-map-name />
                                <peer-route-reflector />
                            </state>
                            <route-map-filters>
                                <route-map-filter>
                                    <route-map-direction>in</route-map-
direction>
                                    <config>
                                        <route-map-direction>in</route-map-
direction>
                                        <route-map-name>in-map</route-map-
name>
                                    </config>
                                    <state>
                                        <route-map-direction>in</route-map-
direction>
                                        <route-map-name>in-map</route-map-
name>
                                    </state>
                                </route-map-filter>
                                <route-map-filter>
                                    <route-map-direction>out</route-map-
direction>
                                    <config>
                                        <route-map-direction>out</route-map-
direction>
```

```
                                        <route-map-name>out-map</route-map-
name>
                                    </config>
                                    <state>
                                        <route-map-direction>out</route-map-
direction>
                                        <route-map-name>out-map</route-map-
name>
                                    </state>
                                </route-map-filter>
                            </route-map-filters>
                        </address-family>
                    </address-families>
                </peer-group>
                <peer-group>
                    <peer-group-tag>peer1</peer-group-tag>
                    <bgp-passwords>
                        <bgp-password>
                            <password>0x9a20ef22549ad84b</password>
                            <config>
                                <password>0x9a20ef22549ad84b</password>
                                <auth-key-encrypt>1</auth-key-encrypt>
                            </config>
                            <state>
                                <password>0x9a20ef22549ad84b</password>
                                <auth-key-encrypt>1</auth-key-encrypt>
                            </state>
                        </bgp-password>
                    </bgp-passwords>
                    <config>
                        <peer-group-tag>peer1</peer-group-tag>
                        <peer-group-range>static</peer-group-range>
                        <peer-as>200</peer-as>
                    </config>
                    <state>
                        <peer-group-tag>peer1</peer-group-tag>
                        <peer-group-range>static</peer-group-range>
                        <peer-as>200</peer-as>
                    </state>
                    <ebgp-multihop>
                        <config>
                            <enabled />
                        </config>
                        <state>
                            <enabled />
                        </state>
                    </ebgp-multihop>
                    <address-families>
                        <address-family>
                            <afi>ipv4</afi>
                            <safi>labeled-unicast</safi>
                            <config>
                                <afi>ipv4</afi>
                                <safi>labeled-unicast</safi>
                                <activate />
                            </config>
                            <state>
```

```
                                <afi>ipv4</afi>
                                <safi>labeled-unicast</safi>
                                <activate />
                            </state>
                        </address-family>
                    </address-families>
                </peer-group>
                <peer-group>
                    <peer-group-tag>peer2</peer-group-tag>
                    <bgp-passwords>
                        <bgp-password>
                            <password>0x9603e78694ace534e74f24019f5bfeb5</
password>
                            <config>
                                <password>0x9603e78694ace534e74f24019f5bfeb5</
password>
                                <auth-key-encrypt>1</auth-key-encrypt>
                            </config>
                            <state>
                                <password>0x9603e78694ace534e74f24019f5bfeb5</
password>
                                <auth-key-encrypt>1</auth-key-encrypt>
                            </state>
                        </bgp-password>
                    </bgp-passwords>
                    <config>
                        <peer-group-tag>peer2</peer-group-tag>
                        <peer-group-range>static</peer-group-range>
                        <peer-as>300</peer-as>
                        <enable-peer-bfd />
                    </config>
                    <state>
                        <peer-group-tag>peer2</peer-group-tag>
                        <peer-group-range>static</peer-group-range>
                        <peer-as>300</peer-as>
                        <enable-peer-bfd />
                    </state>
                    <ebgp-multihop>
                        <config>
                            <maximum-hop-count>10</maximum-hop-count>
                            <enabled />
                        </config>
                        <state>
                            <maximum-hop-count>10</maximum-hop-count>
                            <enabled />
                        </state>
                    </ebgp-multihop>
                    <address-families>
                        <address-family>
                            <afi>ipv6</afi>
                            <safi>labeled-unicast</safi>
                            <maximum-prefixes>
                                <maximum-prefix>
                                    <prefix-count>1</prefix-count>
                                    <config>
                                        <prefix-count>1</prefix-count>
                                        <maximum-prefix-warning />
```

```
                                    </config>
                                    <state>
                                        <prefix-count>1</prefix-count>
                                        <maximum-prefix-warning />
                                    </state>
                                </maximum-prefix>
                            </maximum-prefixes>
                            <config>
                                <afi>ipv6</afi>
                                <safi>labeled-unicast</safi>
                                <activate />
                            </config>
                            <state>
                                <afi>ipv6</afi>
                                <safi>labeled-unicast</safi>
                                <activate />
                            </state>
                        </address-family>
                        <address-family>
                            <afi>ipv6</afi>
                            <safi>vpn-unicast</safi>
                            <maximum-prefixes>
                                <maximum-prefix>
                                    <prefix-count>12345</prefix-count>
                                    <config>
                                        <prefix-count>12345</prefix-count>
                                    </config>
                                    <state>
                                        <prefix-count>12345</prefix-count>
                                    </state>
                                </maximum-prefix>
                            </maximum-prefixes>
                            <config>
                                <afi>ipv6</afi>
                                <safi>vpn-unicast</safi>
                                <activate />
                                <peer-allow-ebgp-vpn />
                            </config>
                            <state>
                                <afi>ipv6</afi>
                                <safi>vpn-unicast</safi>
                                <activate />
                                <peer-allow-ebgp-vpn />
                            </state>
                        </address-family>
                    </address-families>
                </peer-group>
            </peer-groups>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Validation with NetConf get

Here is a NetConf validation response that defines several aspects of BGP, including global BGP configuration, peer groups, and AFI-SAFIs for different address families. The configuration also includes authentication settings, timers, transport settings, and route reflection.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
            </config>
            <route-selection-options>
              <config>
                <enable-aigp>true</enable-aigp>
              </config>
              <state>
                <enable-aigp>true</enable-aigp>
              </state>
            </route-selection-options>
            <state>
              <as>100</as>
              <total-prefixes>0</total-prefixes>
            </state>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
              </afi-safi>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_LABELED_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_LABELED_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
              </afi-safi>
              <afi-safi>
                <afi-safi-name
```

```
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_LABELED_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_LABELED_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
              </afi-safi>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:L3VPN_IPV6_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:L3VPN_IPV6_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
              </afi-safi>
            </afi-safis>
          </global>
          <peer-groups>
            <peer-group>
              <peer-group-name>ABC</peer-group-name>
              <config>
                <auth-password>0x9603e78694ace534ea912b9ab53f8a55</auth-
password>
                <peer-group-name>ABC</peer-group-name>
                <peer-as>100</peer-as>
                <description>Non VRF peer-group configs</description>
              </config>
              <state>
                <auth-password>0x9603e78694ace534ea912b9ab53f8a55</auth-
password>
                <peer-group-name>ABC</peer-group-name>
                <peer-as>100</peer-as>
                <description>Non VRF peer-group configs</description>
              </state>
              <enable-bfd>
                <config>
                  <enabled>true</enabled>
                </config>
                <state>
                  <enabled>true</enabled>
                </state>
              </enable-bfd>
              <timers>
                <config>
                  <connect-retry>300.00</connect-retry>
                  <minimum-advertisement-interval>20.00</minimum-
advertisement-interval>
                  <keepalive-interval>300.00</keepalive-interval>
                  <hold-time>8200.00</hold-time>
                </config>
                <state>
                  <connect-retry>300.00</connect-retry>
```

```
                    <minimum-advertisement-interval>20.00</minimum-
advertisement-interval>
                    <keepalive-interval>300.00</keepalive-interval>
                    <hold-time>8200.00</hold-time>
                  </state>
                </timers>
                <transport>
                  <config>
                    <local-address>10.1.1.1</local-address>
                    <passive-mode>true</passive-mode>
                  </config>
                  <state>
                    <local-address>10.1.1.1</local-address>
                    <passive-mode>true</passive-mode>
                  </state>
                </transport>
                <afi-safis>
                  <afi-safi>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <ipv4-unicast>
                      <prefix-limit>
                        <config>
                          <max-prefixes>4294967295</max-prefixes>
                          <warning-threshold-pct>100</warning-threshold-pct>
                          <prevent-teardown>true</prevent-teardown>
                        </config>
                        <state>
                          <max-prefixes>4294967295</max-prefixes>
                          <warning-threshold-pct>100</warning-threshold-pct>
                          <prevent-teardown>true</prevent-teardown>
                        </state>
                      </prefix-limit>
                      <config>
                        <send-default-route>true</send-default-route>
                      </config>
                      <state>
                        <send-default-route>true</send-default-route>
                      </state>
                    </ipv4-unicast>
                    <config>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </config>
                    <state>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </state>
                    <apply-policy>
                      <config>
                        <import-policy>in-map</import-policy>
                        <export-policy>out-map</export-policy>
```

```
                    </config>
                    <state>
                      <import-policy>in-map</import-policy>
                      <export-policy>out-map</export-policy>
                    </state>
                  </apply-policy>
                </afi-safi>
              </afi-safis>
              <route-reflector>
                <config>
                  <route-reflector-client>true</route-reflector-client>
                </config>
                <state>
                  <route-reflector-client>true</route-reflector-client>
                </state>
              </route-reflector>
            </peer-group>
            <peer-group>
              <peer-group-name>peer1</peer-group-name>
              <config>
                <auth-password>0x9a20ef22549ad84b</auth-password>
                <peer-group-name>peer1</peer-group-name>
                <peer-as>200</peer-as>
              </config>
              <state>
                <auth-password>0x9a20ef22549ad84b</auth-password>
                <peer-group-name>peer1</peer-group-name>
                <peer-as>200</peer-as>
              </state>
              <ebgp-multihop>
                <config>
                  <enabled>true</enabled>
                </config>
                <state>
                  <enabled>true</enabled>
                </state>
              </ebgp-multihop>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_LABELED_UNICAST</afi-safi-name>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_LABELED_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                  <state>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_LABELED_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </state>
                </afi-safi>
              </afi-safis>
            </peer-group>
```

```
            <peer-group>
              <peer-group-name>peer2</peer-group-name>
              <config>
                <auth-password>0x9603e78694ace534e74f24019f5bfeb5</auth-
password>
                <peer-group-name>peer2</peer-group-name>
                <peer-as>300</peer-as>
              </config>
              <state>
                <auth-password>0x9603e78694ace534e74f24019f5bfeb5</auth-
password>
                <peer-group-name>peer2</peer-group-name>
                <peer-as>300</peer-as>
              </state>
              <enable-bfd>
                <config>
                  <enabled>true</enabled>
                </config>
                <state>
                  <enabled>true</enabled>
                </state>
              </enable-bfd>
              <ebgp-multihop>
                <config>
                  <multihop-ttl>10</multihop-ttl>
                  <enabled>true</enabled>
                </config>
                <state>
                  <enabled>true</enabled>
                  <multihop-ttl>10</multihop-ttl>
                </state>
              </ebgp-multihop>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_LABELED_UNICAST</afi-safi-name>
                  <ipv6-labeled-unicast>
                    <prefix-limit>
                      <config>
                        <max-prefixes>1</max-prefixes>
                        <prevent-teardown>true</prevent-teardown>
                      </config>
                      <state>
                        <max-prefixes>1</max-prefixes>
                        <prevent-teardown>true</prevent-teardown>
                      </state>
                    </prefix-limit>
                  </ipv6-labeled-unicast>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_LABELED_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                  <state>
                    <afi-safi-name
```

```
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_LABELED_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </state>
                  </afi-safi>
                  <afi-safi>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:L3VPN_IPV6_UNICAST</afi-safi-name>
                    <l3vpn-ipv6-unicast>
                      <prefix-limit>
                        <config>
                          <max-prefixes>12345</max-prefixes>
                        </config>
                        <state>
                          <max-prefixes>12345</max-prefixes>
                        </state>
                      </prefix-limit>
                    </l3vpn-ipv6-unicast>
                    <config>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:L3VPN_IPV6_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </config>
                    <state>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:L3VPN_IPV6_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </state>
                  </afi-safi>
                </afi-safis>
              </peer-group>
            </peer-groups>
          </bgp>
        </protocol>
      </protocols>
    </network-instance>
  </network-instances>
```

Restrictions

- The first time `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/peer-groups` and `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors` paths are configured, those configuration needs the respective **AFI-SAFI** configuration that is present to indicate **AFI** type:

  `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors/neighbor/afi-safis`

  `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/peer-groups/peer-group/afi-safis`

  The above information is necessary for the OcNOS model to generate the following paths:

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/address-families`

  `/ipi-bgp:bgp/bgp-instances/bgp-instance/peer-groups/peer-group/address-families`

`/ipi-bgp:bgp/bgp-instances/bgp-instance/address-family-vrfs`

- After the `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/peer-groups and /oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors` paths are configured on equipment, on the further configurations on those paths the user does not need to indicate the AFI-SAFI, the translation will look for this information on the equipment database.

Create BGP Peer-groups with User-defined VRFs

This XML configuration snippet is used to configure BGP Peer-groups with user-defined VRFs. Peer groups are configurations that can be used elsewhere without the need to repeat them.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload that provides a structured representation of the settings for various BGP configurations, such as Autonomous System (AS) numbers, Address Family Identifier and Subsequent Address Family Identifier (AFI-SAFI) settings, authentication, timers, and more.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
            </config>
            <route-selection-options>
              <config>
                <enable-aigp>true</enable-aigp>
              </config>
              <state>
                <enable-aigp>true</enable-aigp>
              </state>
            </route-selection-options>
          </global>
        </bgp>
      </protocol>
    </protocols>
  </network-instance>
  <network-instance>
    <name>management</name>
  </network-instance>
  <network-instance>
    <name>vrfA</name>
```

```
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
            </config>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
              </afi-safi>
            </afi-safis>
          </global>
          <peer-groups>
            <peer-group>
              <peer-group-name>peerA</peer-group-name>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <ipv4-unicast>
                    <prefix-limit>
                      <config>
                        <max-prefixes>2331</max-prefixes>
                        <warning-threshold-pct>100</warning-threshold-pct>
                        <prevent-teardown>true</prevent-teardown>
                      </config>
                    </prefix-limit>
                    <config>
                      <send-default-route>true</send-default-route>
                    </config>
                  </ipv4-unicast>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                </afi-safi>
              </afi-safis>
              <config>
                <auth-password>0x9603e78694ace534ea912b9ab53f8a55</auth-
password>
                <peer-group-name>peerA</peer-group-name>
                <peer-as>100</peer-as>
```

```
                <description>VRFA peer-group configs</description>
              </config>
              <transport>
                <config>
                  <local-address>2.2.2.2</local-address>
                  <passive-mode>true</passive-mode>
                </config>
              </transport>
              <timers>
                <config>
                  <connect-retry>900.00</connect-retry>
                  <minimum-advertisement-interval>65535.00</minimum-
advertisement-interval>
                  <keepalive-interval>100.00</keepalive-interval>
                  <hold-time>300.00</hold-time>
                </config>
              </timers>
              <enable-bfd>
                <config>
                  <enabled>true</enabled>
                </config>
              </enable-bfd>
              <route-reflector>
                <config>
                  <route-reflector-client>true</route-reflector-client>
                </config>
              </route-reflector>
            </peer-group>
          </peer-groups>
        </bgp>
      </protocol>
    </protocols>
  </network-instance>
  <network-instance>
    <name>vrfB</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
            </config>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
```

```
              </afi-safi>
            </afi-safis>
          </global>
          <peer-groups>
            <peer-group>
              <peer-group-name>peerB</peer-group-name>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                  <ipv6-unicast>
                    <prefix-limit>
                      <config>
                        <max-prefixes>3123</max-prefixes>
                        <prevent-teardown>true</prevent-teardown>
                      </config>
                    </prefix-limit>
                    <config>
                      <send-default-route>true</send-default-route>
                    </config>
                  </ipv6-unicast>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                </afi-safi>
              </afi-safis>
              <config>
                <auth-password>0x9a20ef22549ad84b</auth-password>
                <peer-group-name>peerB</peer-group-name>
                <peer-as>200</peer-as>
                <local-as>300</local-as>
                <description>VRFB peer-group configs</description>
              </config>
              <enable-bfd>
                <config>
                  <enabled>true</enabled>
                </config>
              </enable-bfd>
              <ebgp-multihop>
                <config>
                  <multihop-ttl>100</multihop-ttl>
                  <enabled>true</enabled>
                </config>
              </ebgp-multihop>
            </peer-group>
          </peer-groups>
        </bgp>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI commands are used to setup the VRF instances and BGP settings within a network infrastructure. VRFs allow for the segmentation of the network, enabling the isolation of routing domains. In this configuration, two VRFs, named `vrfA` and `vrfB`, are defined with unique Route Distinguisher (RD) values, indicating their separation.

Within the BGP configuration, specific address families for IPv4 and IPv6 are defined, each associated with a corresponding VRF. Peer-groups, neighbors, authentication keys, timers, and various other BGP parameters are configured to facilitate routing and peering relationships in the network.

```
 !
ip vrf vrfA
 rd 1:1
!
ip vrf vrfB
 rd 1:2
!
!
router bgp 100
 !
 address-family ipv4 vrf vrfA
 neighbor peerA peer-group
 neighbor peerA remote-as 100
 neighbor peerA fall-over bfd
 neighbor peerA activate
 neighbor peerA authentication-key 0x9603e78694ace534ea912b9ab53f8a55
 neighbor peerA route-reflector-client
 neighbor peerA default-originate
 neighbor peerA maximum-prefix 2331 100 warning-only
 neighbor peerA description VRFA peer-group configs
 neighbor peerA passive
 neighbor peerA update-source 2.2.2.2
 neighbor peerA advertisement-interval 65535
 neighbor peerA timers 100 300
 neighbor peerA timers connect 900
 exit-address-family
 !
 address-family ipv6 vrf vrfB
 neighbor peerB peer-group
 neighbor peerB remote-as 200
 neighbor peerB local-as 300
 neighbor peerB fall-over bfd multihop
 neighbor peerB activate
 neighbor peerB authentication-key 0x9a20ef22549ad84b
 neighbor peerB default-originate
 neighbor peerB maximum-prefix 3123 warning-only
 neighbor peerB description VRFB peer-group configs
 neighbor peerB ebgp-multihop 100
 exit-address-family
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload that illustrates a comprehensive BGP configuration. The configuration is divided into specific sections, each addressing different aspects of BGP operation, security, and peering.

Within this payload, two distinct AFI and SAFI contexts are defined for IPv4 and IPv6 in separate VRF instances named `vrfA` and `vrfB`. Each VRF is associated with specific BGP peer groups, peers, and a range of configurations that dictate the behavior of BGP in these contexts.

The configuration also includes authentication keys, prefix limits, timers, route reflection settings, BFD configuration, and other essential parameters that ensure the proper functioning of BGP in the specified VRFs.

```
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>100</bgp-as>
            <config>
                <bgp-as>100</bgp-as>
            </config>
            <state>
                <bgp-as>100</bgp-as>
                <version>4</version>
                <table-version>1</table-version>
                <total-prefixes>0</total-prefixes>
                <router-run-time-ip-address>0.0.0.0</router-run-time-ip-
address>
                <scan-remain-time>36</scan-remain-time>
            </state>
            <rib>
                <address-family>
                    <safi>link-state</safi>
                    <afi>link-state</afi>
                    <state>
                        <safi>link-state</safi>
                        <afi>link-state</afi>
                    </state>
                </address-family>
            </rib>
            <address-family-vrfs>
                <address-family-vrf>
                    <afi>ipv4</afi>
                    <safi>unicast</safi>
                    <vrf-name>vrfA</vrf-name>
                    <config>
                        <afi>ipv4</afi>
                        <safi>unicast</safi>
                        <vrf-name>vrfA</vrf-name>
                    </config>
                    <state>
                        <afi>ipv4</afi>
                        <safi>unicast</safi>
                        <vrf-name>vrfA</vrf-name>
                    </state>
                    <peer-groups>
                        <peer-group>
                            <peer-group-tag>peerA</peer-group-tag>
                            <bgp-passwords>
                                <bgp-password>

<password>0x9603e78694ace534ea912b9ab53f8a55</password>
                                    <config>

<password>0x9603e78694ace534ea912b9ab53f8a55</password>
```

```
                                        <auth-key-encrypt>1</auth-key-encrypt>
                                    </config>
                                    <state>
<password>0x9603e78694ace534ea912b9ab53f8a55</password>
                                        <auth-key-encrypt>1</auth-key-encrypt>
                                    </state>
                                </bgp-password>
                            </bgp-passwords>
                            <maximum-prefixes>
                                <maximum-prefix>
                                    <prefix-count>2331</prefix-count>
                                    <config>
                                        <prefix-count>2331</prefix-count>
                                        <threshold-percentage>100</threshold-
percentage>
                                        <warning-only />
                                    </config>
                                    <state>
                                        <prefix-count>2331</prefix-count>
                                        <threshold-percentage>100</threshold-
percentage>
                                        <warning-only />
                                    </state>
                                </maximum-prefix>
                            </maximum-prefixes>
                            <config>
                                <peer-group-tag>peerA</peer-group-tag>
                                <peer-group-range>static</peer-group-range>
                                <peer-as>100</peer-as>
                                <source-identifier>2.2.2.2</source-identifier>
                                <peer-connection-interval>900</peer-
connection-interval>
                                <neighbor-passive />
                                <min-route-advertisement-interval>65535</min-
route-advertisement-interval>
                                <peer-description>VRFA peer-group configs</
peer-description>
                                <enable-peer-bfd />
                                <activate />
                                <default-peer-route-map-name />
                                <peer-route-reflector />
                            </config>
                            <state>
                                <peer-group-tag>peerA</peer-group-tag>
                                <peer-group-range>static</peer-group-range>
                                <peer-as>100</peer-as>
                                <source-identifier>2.2.2.2</source-identifier>
                                <peer-connection-interval>900</peer-
connection-interval>
                                <neighbor-passive />
                                <min-route-advertisement-interval>65535</min-
route-advertisement-interval>
                                <peer-description>VRFA peer-group configs</
peer-description>
                                <enable-peer-bfd />
                                <activate />
                                <default-peer-route-map-name />
```

```
                                <peer-route-reflector />
                            </state>
                            <timers>
                                <config>
                                    <keep-alive>100</keep-alive>
                                    <hold-time>300</hold-time>
                                </config>
                                <state>
                                    <keep-alive>100</keep-alive>
                                    <hold-time>300</hold-time>
                                </state>
                            </timers>
                        </peer-group>
                    </peer-groups>
                </address-family-vrf>
                <address-family-vrf>
                    <afi>ipv6</afi>
                    <safi>unicast</safi>
                    <vrf-name>vrfB</vrf-name>
                    <config>
                        <afi>ipv6</afi>
                        <safi>unicast</safi>
                        <vrf-name>vrfB</vrf-name>
                    </config>
                    <state>
                        <afi>ipv6</afi>
                        <safi>unicast</safi>
                        <vrf-name>vrfB</vrf-name>
                    </state>
                    <peer-groups>
                        <peer-group>
                            <peer-group-tag>peerB</peer-group-tag>
                            <bgp-passwords>
                                <bgp-password>
                                    <password>0x9a20ef22549ad84b</password>
                                    <config>
                                        <password>0x9a20ef22549ad84b</
password>
                                        <auth-key-encrypt>1</auth-key-encrypt>
                                    </config>
                                    <state>
                                        <password>0x9a20ef22549ad84b</
password>
                                        <auth-key-encrypt>1</auth-key-encrypt>
                                    </state>
                                </bgp-password>
                            </bgp-passwords>
                            <maximum-prefixes>
                                <maximum-prefix>
                                    <prefix-count>3123</prefix-count>
                                    <config>
                                        <prefix-count>3123</prefix-count>
                                        <maximum-prefix-warning />
                                    </config>
                                    <state>
                                        <prefix-count>3123</prefix-count>
                                        <maximum-prefix-warning />
```

```
                                    </state>
                                </maximum-prefix>
                            </maximum-prefixes>
                            <config>
                                <peer-group-tag>peerB</peer-group-tag>
                                <peer-group-range>static</peer-group-range>
                                <peer-as>200</peer-as>
                                <peer-local-as>300</peer-local-as>
                                <peer-description>VRFB peer-group configs</
peer-description>
                                <enable-peer-bfd />
                                <enable-peer-bfd-multihop />
                                <activate />
                                <default-peer-route-map-name />
                            </config>
                            <state>
                                <peer-group-tag>peerB</peer-group-tag>
                                <peer-group-range>static</peer-group-range>
                                <peer-as>200</peer-as>
                                <peer-local-as>300</peer-local-as>
                                <peer-description>VRFB peer-group configs</
peer-description>
                                <enable-peer-bfd />
                                <enable-peer-bfd-multihop />
                                <activate />
                                <default-peer-route-map-name />
                            </state>
                            <ebgp-multihop>
                                <config>
                                    <maximum-hop-count>100</maximum-hop-count>
                                    <enabled />
                                </config>
                                <state>
                                    <maximum-hop-count>100</maximum-hop-count>
                                    <enabled />
                                </state>
                            </ebgp-multihop>
                        </peer-group>
                    </peer-groups>
                </address-family-vrf>
            </address-family-vrfs>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Validation with NetConf get

Here is a NetConf validation response that specifies different network instances, including the `default`, `management`, `vrfA`, and `vrfB` instances.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
```

```
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
            </config>
            <route-selection-options>
              <config>
                <enable-aigp>true</enable-aigp>
              </config>
              <state>
                <enable-aigp>true</enable-aigp>
              </state>
            </route-selection-options>
            <state>
              <as>100</as>
              <total-prefixes>0</total-prefixes>
            </state>
          </global>
        </bgp>
      </protocol>
    </protocols>
  </network-instance>
  <network-instance>
    <name>management</name>
  </network-instance>
  <network-instance>
    <name>vrfA</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
            </config>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
                <state>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                </state>
              </afi-safi>
```

```
            </afi-safis>
            <state>
              <as>100</as>
            </state>
          </global>
          <peer-groups>
            <peer-group>
              <peer-group-name>peerA</peer-group-name>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <ipv4-unicast>
                    <prefix-limit>
                      <config>
                        <max-prefixes>2331</max-prefixes>
                        <warning-threshold-pct>100</warning-threshold-pct>
                        <prevent-teardown>true</prevent-teardown>
                      </config>
                      <state>
                        <max-prefixes>2331</max-prefixes>
                        <warning-threshold-pct>100</warning-threshold-pct>
                        <prevent-teardown>true</prevent-teardown>
                      </state>
                    </prefix-limit>
                    <config>
                      <send-default-route>true</send-default-route>
                    </config>
                    <state>
                      <send-default-route>true</send-default-route>
                    </state>
                  </ipv4-unicast>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                  <state>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </state>
                </afi-safi>
              </afi-safis>
              <config>
                <auth-password>0x9603e78694ace534ea912b9ab53f8a55</auth-
password>
                <peer-group-name>peerA</peer-group-name>
                <peer-as>100</peer-as>
                <description>VRFA peer-group configs</description>
              </config>
              <state>
                <auth-password>0x9603e78694ace534ea912b9ab53f8a55</auth-
password>
                <peer-group-name>peerA</peer-group-name>
```

```
                <peer-as>100</peer-as>
                <description>VRFA peer-group configs</description>
              </state>
              <transport>
                <config>
                  <local-address>2.2.2.2</local-address>
                  <passive-mode>true</passive-mode>
                </config>
                <state>
                  <local-address>2.2.2.2</local-address>
                  <passive-mode>true</passive-mode>
                </state>
              </transport>
              <timers>
                <config>
                  <connect-retry>900.00</connect-retry>
                  <minimum-advertisement-interval>65535.00</minimum-
advertisement-interval>
                  <keepalive-interval>100.00</keepalive-interval>
                  <hold-time>300.00</hold-time>
                </config>
                <state>
                  <connect-retry>900.00</connect-retry>
                  <minimum-advertisement-interval>65535.00</minimum-
advertisement-interval>
                  <keepalive-interval>100.00</keepalive-interval>
                  <hold-time>300.00</hold-time>
                </state>
              </timers>
              <enable-bfd>
                <config>
                  <enabled>true</enabled>
                </config>
                <state>
                  <enabled>true</enabled>
                </state>
              </enable-bfd>
              <route-reflector>
                <config>
                  <route-reflector-client>true</route-reflector-client>
                </config>
                <state>
                  <route-reflector-client>true</route-reflector-client>
                </state>
              </route-reflector>
            </peer-group>
          </peer-groups>
        </bgp>
      </protocol>
    </protocols>
  </network-instance>
  <network-instance>
    <name>vrfB</name>
    <protocols>
      <protocol>
        <identifier
```

```
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
        <bgp>
          <global>
            <config>
              <as>100</as>
            </config>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
                <state>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                </state>
              </afi-safi>
            </afi-safis>
            <state>
              <as>100</as>
            </state>
          </global>
          <peer-groups>
            <peer-group>
              <peer-group-name>peerB</peer-group-name>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                  <ipv6-unicast>
                    <prefix-limit>
                      <config>
                        <max-prefixes>3123</max-prefixes>
                        <prevent-teardown>true</prevent-teardown>
                      </config>
                      <state>
                        <max-prefixes>3123</max-prefixes>
                        <prevent-teardown>true</prevent-teardown>
                      </state>
                    </prefix-limit>
                    <config>
                      <send-default-route>true</send-default-route>
                    </config>
                    <state>
                      <send-default-route>true</send-default-route>
                    </state>
                  </ipv6-unicast>
                  <config>
                    <afi-safi-name
```

```
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </config>
                    <state>
                      <afi-safi-name
                        xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                      <enabled>true</enabled>
                    </state>
                  </afi-safi>
                </afi-safis>
                <config>
                  <auth-password>0x9a20ef22549ad84b</auth-password>
                  <peer-group-name>peerB</peer-group-name>
                  <peer-as>200</peer-as>
                  <local-as>300</local-as>
                  <description>VRFB peer-group configs</description>
                </config>
                <state>
                  <auth-password>0x9a20ef22549ad84b</auth-password>
                  <peer-group-name>peerB</peer-group-name>
                  <peer-as>200</peer-as>
                  <local-as>300</local-as>
                  <description>VRFB peer-group configs</description>
                </state>
                <enable-bfd>
                  <config>
                    <enabled>true</enabled>
                  </config>
                  <state>
                    <enabled>true</enabled>
                  </state>
                </enable-bfd>
                <ebgp-multihop>
                  <config>
                    <multihop-ttl>100</multihop-ttl>
                    <enabled>true</enabled>
                  </config>
                  <state>
                    <enabled>true</enabled>
                    <multihop-ttl>100</multihop-ttl>
                  </state>
                </ebgp-multihop>
              </peer-group>
            </peer-groups>
          </bgp>
        </protocol>
      </protocols>
    </network-instance>
  </network-instances>
```

Restrictions

- The first time `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/peer-groups` and `/oc-netinst:network-instances/network-instance/protocols/protocol/`

`bgp/neighbors` paths are configured, those configuration needs the respective **AFI-SAFI** configuration that is present to indicate **AFI** type:

`/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors/neighbor/afi-safis`

`/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/peer-groups/peer-group/afi-safis`

The above information is necessary for the OcNOS model to generate the following paths:

`/ipi-bgp:bgp/bgp-instances/bgp-instance/address-families`

`/ipi-bgp:bgp/bgp-instances/bgp-instance/peer-groups/peer-group/address-families`

`/ipi-bgp:bgp/bgp-instances/bgp-instance/address-family-vrfs`

- After the `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/peer-groups` and /`oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors` paths are configured on equipment, on the further configurations on those paths the user need not indicate the AFI-SAFI as the translation will look for this information on the equipment database.

Configure Update-source on Neighbor

This XML configuration snippet is used to specify the configuration of the `update-source` parameter on a neighbor in the context of a network device configuration. This XML configuration allows internal BGP sessions to use any operating interface for TCP connections.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload that specifies the configuration of a network instance named `default` with BGP. Within this network instance, a BGP peer or neighbor is configured to establish a connection with the IP address `1.1.1.1` and share IPv4 unicast routing information.

In this payload, various parameters such as the local address, peer AS, and AFI-SAFI are configured to enable communication and routing between BGP neighbors.

This XML configuration allows internal BGP sessions to use any available operating interface for establishing TCP connections.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">
        <identifier>oc-pol-types:BGP</identifier>
        <name>100</name>
        <config>
          <identifier>oc-pol-types:BGP</identifier>
          <name>100</name>
          <enabled>true</enabled>
        </config>
        <bgp>
```

```
            <global>
              <config>
                <as>100</as>
              </config>
            </global>
            <neighbors>
              <neighbor>
                <afi-safis>
                    <afi-safi>
                        <afi-safi-name xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                        <config>
                            <afi-safi-name xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                            <enabled>true</enabled>
                        </config>
                    </afi-safi>
                </afi-safis>
                <neighbor-address>1.1.1.1</neighbor-address>
                <config>
                  <neighbor-address>1.1.1.1</neighbor-address>
                  <peer-as>100</peer-as>
                </config>
                <transport>
                  <config>
                    <local-address>2.2.2.2</local-address>
                  </config>
                </transport>
              </neighbor>
            </neighbors>
          </bgp>
        </protocol>
      </protocols>
    </network-instance>
  </network-instances>
```

OcNOS CLI Command

The below CLI commands are to configure a BGP neighbor relationship within the BGP process running on a router with AS number `100`. Specifically, it configures a BGP neighbor with the IP address `1.1.1.1`, assigns it the same AS number (`AS 100`), and specifies that the local address for establishing the BGP connection should be `2.2.2.2`. This `update-source` parameter ensures that the BGP sessions between the local router and the neighbor use the specified source IP address (`2.2.2.2)` for their TCP connections.

```
 router bgp 100
 neighbor 1.1.1.1 remote-as 100
 neighbor 1.1.1.1 update-source 2.2.2.2
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload for a BGP instance with AS number `100` is defined. Within this instance, a BGP peer relationship is established with a neighbor having the IP address `1.1.1.1`. The payload further specifies that the local router should use the source IP address `2.2.2.2` when communicating with this BGP peer, ensuring proper BGP session establishment and communication.

```
    <bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>100</bgp-as>
            <config>
                <bgp-as>100</bgp-as>
            </config>
            <peers>
                <peer>
                    <peer-address>1.1.1.1</peer-address>
                    <config>
                        <peer-address>1.1.1.1</peer-address>
                        <source-identifier>2.2.2.2</source-identifier>
                        <peer-as>100</peer-as>
                    </config>
                </peer>
            </peers>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Validation with NetConf get

Here is a NetConf validation response describing the `default` network instance, along with its associated protocols. Notably, the response includes information about a BGP instance with an AS number of `100`, illustrating its global and neighbor-specific settings. The BGP neighbor relationship is established with an IP address of `1.1.1.1` and is configured to use a local address of `2.2.2.2` for communication.

```
        <network-instances xmlns="http://openconfig.net/yang/network-
instance">
      <network-instance>
        <name>default</name>
        <config>
          <name>default</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
        </config>
        <state>
          <name>default</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
        </state>
        <protocols>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
            <name>DIRECTLY_CONNECTED</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
              <name>DIRECTLY_CONNECTED</name>
              <enabled>true</enabled>
            </config>
```

```
            <state>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
              <name>DIRECTLY_CONNECTED</name>
              <enabled>true</enabled>
            </state>
          </protocol>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
            <name>100</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:BGP</identifier>
              <name>100</name>
              <enabled>true</enabled>
            </config>
            <bgp>
              <global>
                <config>
                  <as>100</as>
                </config>
                <state>
                  <as>100</as>
                </state>
              </global>
              <neighbors>
                <neighbor>
                  <neighbor-address>1.1.1.1</neighbor-address>
                  <afi-safis>
                      <afi-safi>
                          <afi-safi-name xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                          <config>
                              <afi-safi-name xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                              <enabled>true</enabled>
                          </config>
                      </afi-safi>
                  </afi-safis>
                  <config>
                    <neighbor-address>1.1.1.1</neighbor-address>
                    <peer-as>100</peer-as>
                  </config>
                  <transport>
                    <config>
                      <local-address>2.2.2.2</local-address>
                    </config>
                    <state>
                      <local-address>2.2.2.2</local-address>
                    </state>
                  </transport>
                  <state>
                    <neighbor-address>1.1.1.1</neighbor-address>
                    <peer-as>100</peer-as>
```

```
                  </state>
                </neighbor>
              </neighbors>
            </bgp>
            <state>
              <enabled>true</enabled>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:BGP</identifier>
              <name>100</name>
            </state>
          </protocol>
        </protocols>
      </network-instance>
    </network-instances>
```

Restrictions

None

Double Link in Load Balance

In this XML configuration snippet, two links are used to ensure service availability, and all traffic is routed through both links simultaneously. If either of these links experiences a failure, all traffic is automatically redirected to the remaining available link.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload to indicate the configuration of a network instance named `TEST_A9` with associated BGP protocols and peer groups. In this scenario, two peer groups, `PPAL_BGP_L3` and `BCK_BGP_L3`, are defined within BGP, each with its specific settings. The configuration also specifies the use of multiple paths for external BGP (eBGP) sessions and enables IPv4 unicast address families for these peer groups. Furthermore, it outlines neighbor configurations, including their addresses, peer group associations, and additional parameters like local and peer AS numbers.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
        <name>TEST_A9</name>
        <config>
            <name>TEST_A9</name>
            <type>L3VRF</type>
            <route-distinguisher>65000:100</route-distinguisher>
        </config>
        <protocols>
            <protocol>
                <identifier>BGP</identifier>
                <name>65000</name>
                <config>
                    <identifier>BGP</identifier>
```

```
                    <name>65000</name>
                    <enabled>true</enabled>
                </config>
                <bgp>
                    <peer-groups>
                        <peer-group>
                            <afi-safis>
                                <afi-safi>
                                    <afi-safi-name xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                                    <config>
                                        <afi-safi-name xmlns:oc-bgp-
types="http://openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-
safi-name>
                                        <enabled>true</enabled>
                                    </config>
                                </afi-safi>
                            </afi-safis>
                            <peer-group-name>PPAL_BGP_L3</peer-group-name>
                            <config>
                                <peer-group-name>PPAL_BGP_L3</peer-group-name>
                                <peer-as>18746</peer-as>
                            </config>
                        </peer-group>
                        <peer-group>
                            <afi-safis>
                                <afi-safi>
                                    <afi-safi-name xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                                    <config>
                                        <afi-safi-name xmlns:oc-bgp-
types="http://openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-
safi-name>
                                        <enabled>true</enabled>
                                    </config>
                                </afi-safi>
                            </afi-safis>
                            <peer-group-name>BCK_BGP_L3</peer-group-name>
                            <config>
                                <peer-group-name>BCK_BGP_L3</peer-group-name>
                                <peer-as>18010</peer-as>
                            </config>
                        </peer-group>
                    </peer-groups>
                    <global>
                        <config>
                            <as>65000</as>
                        </config>
                        <use-multiple-paths>
                            <config>
                                <enabled>true</enabled>
                            </config>
                            <ebgp>
                                <config>
                                    <maximum-paths>2</maximum-paths>
                                </config>
                            </ebgp>
                        </use-multiple-paths>
```

```
                    </global>
                    <neighbors>
                        <neighbor>
                            <afi-safis>
                                <afi-safi>
                                    <afi-safi-name xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                                    <config>
                                        <afi-safi-name xmlns:oc-bgp-
types="http://openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-
safi-name>
                                        <enabled>true</enabled>
                                    </config>
                                </afi-safi>
                            </afi-safis>
                            <neighbor-address>172.17.30.2</neighbor-address>
                            <config>
                                <peer-group>PPAL_BGP_L3</peer-group>
                                <neighbor-address>172.17.30.2</neighbor-
address>
                                <peer-as>18747</peer-as>
                                <local-as>65001</local-as>
                                <description>PPAL_SESSION</description>
                            </config>
                        </neighbor>
                        <neighbor>
                            <afi-safis>
                                <afi-safi>
                                    <afi-safi-name xmlns:oc-bgp-types="http://
openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                                    <config>
                                        <afi-safi-name xmlns:oc-bgp-
types="http://openconfig.net/yang/bgp-types">oc-bgp-types:IPV4_UNICAST</afi-
safi-name>
                                        <enabled>true</enabled>
                                    </config>
                                </afi-safi>
                            </afi-safis>
                            <neighbor-address>172.17.40.2</neighbor-address>
                            <config>
                                <peer-group>BCK_BGP_L3</peer-group>
                                <neighbor-address>172.17.40.2</neighbor-
address>
                                <peer-as>18010</peer-as>
                                <local-as>65002</local-as>
                                <description>BCK_SESSION</description>
                            </config>
                        </neighbor>
                    </neighbors>
                </bgp>
            </protocol>
        </protocols>
    </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI commands are used to create a specific VRF instance named `TEST_A9` with a unique route distinguisher (RD) of `65000:100`. Within the BGP configuration for AS number `65000`, two address families, IPv4 and IPv6, are defined for the `TEST_A9` VRF, each allowing up to two paths for eBGP (external BGP) sessions.

The configuration also includes the setup of neighbor relationships, with peers grouped into `PPAL_BGP_L3` and `BCK_BGP_L3` peer groups. Each neighbor is associated with the appropriate peer group, and their remote AS numbers and descriptions are specified.

```
 !
ip vrf TEST_A9
 rd 65000:100
!
router bgp 65000
 !
 address-family ipv4 vrf TEST_A9
 max-paths ebgp 2
 neighbor BCK_BGP_L3 peer-group
 neighbor BCK_BGP_L3 remote-as 18010
 neighbor BCK_BGP_L3 activate
 neighbor PPAL_BGP_L3 peer-group
 neighbor PPAL_BGP_L3 remote-as 18746
 neighbor PPAL_BGP_L3 activate
 neighbor 172.17.30.2 remote-as 18747
 neighbor 172.17.30.2 peer-group PPAL_BGP_L3
 neighbor 172.17.40.2 remote-as 18010
 neighbor 172.17.40.2 peer-group BCK_BGP_L3
 neighbor 172.17.30.2 description PPAL_SESSION
 neighbor 172.17.40.2 description BCK_SESSION
 exit-address-family
 !
 address-family ipv6 vrf TEST_A9
 max-paths ebgp 2
 exit-address-family
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload illustrating the configuration of a network instance with associated BGP settings. This configuration is designed to establish BGP sessions within the specified VRF instance and configure BGP-related parameters.

In this payload, the VRF instance type, BGP AS, BGP peering configurations for both IPv4 and IPv6 address families, and the maximum number of paths allowed for eBGP (external BGP) sessions are configured.

```
<network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">
    <network-instance>
        <instance-name>TEST_A9</instance-name>
        <instance-type>vrf</instance-type>
        <config>
            <instance-name>TEST_A9</instance-name>
            <instance-type>vrf</instance-type>
        </config>
        <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
            <config>
```

```
                <vrf-name>TEST_A9</vrf-name>
            </config>
            <bgp-vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp-vrf">
                <config>
                    <rd-string>65000:100</rd-string>
                </config>
            </bgp-vrf>
        </vrf>
    </network-instance>
</network-instances>
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>65000</bgp-as>
            <config>
                <bgp-as>65000</bgp-as>
            </config>
            <address-family-vrfs>
                <address-family-vrf>
                    <afi>ipv4</afi>
                    <safi>unicast</safi>
                    <vrf-name>TEST_A9</vrf-name>
                    <vrf-peers>
                        <vrf-peer>
                            <peer-address>172.17.30.2</peer-address>
                            <config>
                                <peer-address>172.17.30.2</peer-address>
                                <peer-as>18747</peer-as>
                                <peer-description>PPAL_SESSION</peer-
description>
                                <mapped-peer-group-tag-af>PPAL_BGP_L3</mapped-
peer-group-tag-af>
                            </config>
                        </vrf-peer>
                        <vrf-peer>
                            <peer-address>172.17.40.2</peer-address>
                            <config>
                                <peer-address>172.17.40.2</peer-address>
                                <peer-as>18010</peer-as>
                                <peer-description>BCK_SESSION</peer-
description>
                                <mapped-peer-group-tag-af>BCK_BGP_L3</mapped-
peer-group-tag-af>
                            </config>
                        </vrf-peer>
                    </vrf-peers>
                    <config>
                        <afi>ipv4</afi>
                        <safi>unicast</safi>
                        <vrf-name>TEST_A9</vrf-name>
                    </config>
                    <maximum-paths>
                        <config>
                            <ebgp-max-path>2</ebgp-max-path>
                        </config>
                    </maximum-paths>
                    <peer-groups>
```

```
                        <peer-group>
                            <peer-group-tag>BCK_BGP_L3</peer-group-tag>
                            <config>
                                <peer-group-tag>BCK_BGP_L3</peer-group-tag>
                                <peer-group-range>static</peer-group-range>
                                <peer-as>18010</peer-as>
                                <activate />
                            </config>
                        </peer-group>
                        <peer-group>
                            <peer-group-tag>PPAL_BGP_L3</peer-group-tag>
                            <config>
                                <peer-group-tag>PPAL_BGP_L3</peer-group-tag>
                                <peer-group-range>static</peer-group-range>
                                <peer-as>18746</peer-as>
                                <activate />
                            </config>
                        </peer-group>
                    </peer-groups>
                </address-family-vrf>
                <address-family-vrf>
                    <afi>ipv6</afi>
                    <safi>unicast</safi>
                    <vrf-name>TEST_A9</vrf-name>
                    <config>
                        <afi>ipv6</afi>
                        <safi>unicast</safi>
                        <vrf-name>TEST_A9</vrf-name>
                    </config>
                    <maximum-paths>
                        <config>
                            <ebgp-max-path>2</ebgp-max-path>
                        </config>
                    </maximum-paths>
                </address-family-vrf>
            </address-family-vrfs>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Validation with NetConf get

Here is a NetConf validation response about the network instance's configuration, the BGP AS number, BGP peering details, and protocol tables for both IPv4 and IPv6 address families.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>TEST_A9</name>
    <config>
      <name>TEST_A9</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
      <route-distinguisher>65000:100</route-distinguisher>
    </config>
    <protocols>
      <protocol>
```

```
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</identifier>
        <name>DIRECTLY_CONNECTED</name>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </config>
      </protocol>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>65000</name>
        <bgp>
          <global>
            <config>
              <as>65000</as>
            </config>
            <use-multiple-paths>
              <config>
                <enabled>true</enabled>
              </config>
              <ebgp>
                <config>
                  <maximum-paths>2</maximum-paths>
                </config>
              </ebgp>
            </use-multiple-paths>
          </global>
          <neighbors>
            <neighbor>
              <neighbor-address>172.17.30.2</neighbor-address>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>false</enabled>
                  </config>
                </afi-safi>
              </afi-safis>
              <config>
                <enabled>false</enabled>
                <neighbor-address>172.17.30.2</neighbor-address>
                <peer-as>18747</peer-as>
                <description>PPAL_SESSION</description>
                <peer-group>PPAL_BGP_L3</peer-group>
              </config>
            </neighbor>
            <neighbor>
```

```
              <neighbor-address>172.17.40.2</neighbor-address>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>false</enabled>
                  </config>
                </afi-safi>
              </afi-safis>
              <config>
                <enabled>false</enabled>
                <neighbor-address>172.17.40.2</neighbor-address>
                <peer-as>18010</peer-as>
                <description>BCK_SESSION</description>
                <peer-group>BCK_BGP_L3</peer-group>
              </config>
            </neighbor>
          </neighbors>
          <peer-groups>
            <peer-group>
              <peer-group-name>BCK_BGP_L3</peer-group-name>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                </afi-safi>
              </afi-safis>
              <config>
                <peer-group-name>BCK_BGP_L3</peer-group-name>
                <peer-as>18010</peer-as>
              </config>
            </peer-group>
            <peer-group>
              <peer-group-name>PPAL_BGP_L3</peer-group-name>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </config>
                </afi-safi>
```

```
              </afi-safis>
              <config>
                <peer-group-name>PPAL_BGP_L3</peer-group-name>
                <peer-as>18746</peer-as>
              </config>
            </peer-group>
          </peer-groups>
        </bgp>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>65000</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
    <tables>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </config>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
```

```
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </config>
      </table>
    </tables>
  </network-instance>
</network-instances>
```

Restrictions

- On the first time `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/peer-groups` and `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors` paths are configured, those configuration needs the respective **AFI-SAFI** configuration that be present to indicate **AFI** type:

  `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors/neighbor/afi-safis`

  `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/peer-groups/peer-group/afi-safis`

  The above information is necessary on OcNOS model to generate the follow paths:

  `/ipi-bgp:bgp/bgp-instance/address-family`

  `/ipi-bgp:bgp/bgp-instance/peer-group/address-families`

  `/ipi-bgp:bgp/bgp-instance/address-family-vrf`

- After the `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/peer-groups` and `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/neighbors` paths are configured on equipment, on the further configurations on those paths the user do not need to indicate the AFI-SAFE, the translation will look for this information on equipment database.

Delete BGP Instance

In this XML configuration snippet, BGP instances are configured on network-instance on OpenConfig and on container BGP on OcNos side. Due this difference the delete process need to handle if the operation is trying to delete one VRF instance or the entire BGP instance.

When using OpenConfig, the BGP object on OcNOS database is only deleted by the delete on "default" network-instance. When the delete is execute on VRF network-instance it only deletes the given VRF instance.

If there are VRF instances configured and a delete operation is executed on "default" network-instance, it going to clean only entries configured on "default" network-instance. To remove VRF instances, the user needs to apply a operation delete on VRF instances.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample NetConf Payload to delete BGP instance.

Delete VRF instance:

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>VRF1</name>
    <protocols>
      <protocol operation="delete">
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

Delete default instance:

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol operation="delete">
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>100</name>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to delete BGP instance.

Delete VRF instance:

```
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>100</bgp-as>
```

```
            <address-family-vrfs>
                <address-family-vrf operation="delete">
                    <afi>ipv4</afi>
                    <safi>unicast</safi>
                    <vrf-name>VRF1</vrf-name>
                </address-family-vrf>
            </address-family-vrfs>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Delete default instance:

```
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
  <bgp-instances>
    <bgp-instance operation="delete">
      <bgp-as>100</bgp-as>
    </bgp-instance>
  </bgp-instances>
</bgp>
```

Restrictions

On OpenConfig BGP datamodel, the container global does not have any key to identify a single BGP instance, but the BGP AS information is placed under the xpath `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/config/as`.

On IPI BGP datamodel, the BGP AS information is a key for BGP container, and it does not allow the delete on xpath `/ipi-bgp:/bgp/bgp-instances/bgp-instance/config/bgp-as` to avoid deletion of its own instance key.

In this case, when translation framework detects a `delete` or `remove` operation on the following OpenConfig xpaths, it triggers an error message to NETCONF client and does not execute the `delete` operation.

1. `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global`
2. `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/config`
3. `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/config/as`

To avoid this issue, whenever a configuration needs to be deleted or removed under OpenConfig xpath `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/global/config`, the user must add a `delete` or `remove` operation directly on the leaf or leaves to be removed, rather than deleting the entire container.

BGP RIB Counters IPv4

The BGP RIB (Routing information base) is a set of counters to retrieve information about routes from neighbors. This section gives details on BGP RIB IPv4.

The containers related to RIB are only the status on both Open Config and OcNOS datamodels, and there are no configuration related to this.

On OcNOS, the containers are available only after the BGP negotiate routers, the tables are empty before and cannot be retrieved.

The table below displays each table information:.

OcNOS CLI	OcNOS XPath	Open Config XPath
show ip bgp neighbors <**IP-address**> routes	/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop	/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv4-unicast/loc-rib/routes/route
show ip bgp neighbors <**IP-address**> received-routes	**For default VRF instances**: /ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop **For non-default VRF instances**: /ipi-bgp:bgp/bgp-instances/bgp-instance/peers/peer/address-families/address-family/peer-adj-in-route/next-hop	/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv4-unicast/neighbors/neighbor/adj-rib-in-post/routes/route
show ip bgp neighbors <**IP-address**> advertised-routes	**For default VRF instances**: /ipi-bgp:bgp/bgp-instances/bgp-instance/address-family-vrfs/address-family-vrf/vrf-peers/peer-adj-out-route/next-hop **For non-default VRF instances**: /ipi-bgp:bgp/bgp-instances/bgp-instance/peers/peer/address-families/address-family/peer-adj-out-route/next-hop	/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv4-unicast/neighbors/neighbor/adj-rib-out-post/routes/route
To get **"last update"** information: show ip bgp <**IP-address**>	/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop	/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv4-unicast/loc-rib/routes/route
show ip bgp ipv4 unicast <**IP-address**>	/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop	/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv4-unicast/loc-rib/routes/route
When have user-defined VRF: show ip bgp vrf <**VRF name**>	/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop	/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv4-unicast/loc-rib/routes/route
When have user-defined VRF: show ip bgp vpnv4 vrf <**VRF name**>	/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop	/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv4-unicast/loc-rib/routes/route
When have user-defined VRF: show ip bgp vpnv4 vrf <**VRF name**> <**IP-address**>	/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop	/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv4-unicast/loc-rib/routes/route

Release

This configuration was introduced in OcNOS version 6.2.

OpenConfig NetConf Payload

N/A

OcNOS CLI Command

The below CLI command is an example to illustrate the indicated counters.

To have a complete BGP RIB scenario, it needs more than one equipment configured to work with BGP.

```
router bgp 200
 neighbor 10.10.10.11 remote-as 300
 !
 address-family ipv4 unicast
 redistribute connected
 redistribute static
 neighbor 10.10.10.11 activate
 neighbor 10.10.10.11 soft-reconfiguration inbound
 exit-address-family
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to illustrate the BGP RIB Counters IPv4.

```
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>200</bgp-as>
            <config>
                <bgp-as>200</bgp-as>
            </config>
            <state>
                <bgp-as>200</bgp-as>
                <version>4</version>
                <table-version>1</table-version>
                <total-prefixes>2</total-prefixes>
                <router-run-time-ip-address>192.168.122.61</router-run-time-
ip-address>
                <scan-remain-time>16</scan-remain-time>
            </state>
            <rib>
                <address-family>
                    <safi>unicast</safi>
                    <afi>ipv4</afi>
                    <state>
                        <safi>unicast</safi>
                        <afi>ipv4</afi>
                    </state>
                    <routes>
                        <route>
                            <route-distinguisher>0</route-distinguisher>
                            <network-address>10.10.10.0/24</network-address>
                            <next-hop>
                                <next-hop-address>0.0.0.0</next-hop-address>
                                <state>
```

```
                                    <next-hop-address>0.0.0.0</next-hop-
address>
                                    <peer-network-weight>32768</peer-network-
weight>
                                    <bgp-as-path-string>Local</bgp-as-path-
string>
                                    <bgp-as-path-4-byte-origin>incomplete</
bgp-as-path-4-byte-origin>
                                    <ibgp-metric-route>0</ibgp-metric-route>
                                    <route-local-preference>100</route-local-
preference>
                                    <last-update-route>2022-12-04T17:50:28Z</
last-update-route>
                                    <reflector-client-route>false</reflector-
client-route>
                                    <route-dampening-active>false</route-
dampening-active>
                                    <history-route>false</history-route>
                                    <nexthop-valid-route>true</nexthop-valid-
route>
                                    <med-flag-type-route>false</med-flag-type-
route>
                                    <valid-route>true</valid-route>
                                    <stale-route>false</stale-route>
                                    <route-type>sourced</route-type>
                                    <ecmp-multi-candidate-route>false</ecmp-
multi-candidate-route>
                                    <multi-installed-route>false</multi-
installed-route>
                                    <atomic-aggregate-route>false</atomic-
aggregate-route>
                                    <selected-route>true</selected-route>
                                    <bgp-tx-path-id>-1</bgp-tx-path-id>
                                    <bgp-rx-path-id>-1</bgp-rx-path-id>
                                </state>
                            </next-hop>
                            <next-hop>
                                <next-hop-address>10.10.10.11</next-hop-
address>
                                <state>
                                    <next-hop-address>10.10.10.11</next-hop-
address>
                                    <peer-network-weight>32768</peer-network-
weight>
                                    <bgp-as-path-string>Local</bgp-as-path-
string>
                                    <bgp-as-path-4-byte-origin>incomplete</
bgp-as-path-4-byte-origin>
                                    <ibgp-metric-route>0</ibgp-metric-route>
                                    <route-local-preference>100</route-local-
preference>
                                    <last-update-route>2022-12-04T17:50:28Z</
last-update-route>
                                    <reflector-client-route>false</reflector-
client-route>
                                    <route-dampening-active>false</route-
dampening-active>
                                    <history-route>false</history-route>
                                    <nexthop-valid-route>true</nexthop-valid-
route>
```

```
                                    <med-flag-type-route>false</med-flag-type-
route>
                                    <valid-route>true</valid-route>
                                    <stale-route>false</stale-route>
                                    <route-type>sourced</route-type>
                                    <ecmp-multi-candidate-route>false</ecmp-
multi-candidate-route>
                                    <multi-installed-route>false</multi-
installed-route>
                                    <atomic-aggregate-route>false</atomic-
aggregate-route>
                                    <selected-route>true</selected-route>
                                    <bgp-tx-path-id>-1</bgp-tx-path-id>
                                    <bgp-rx-path-id>-1</bgp-rx-path-id>
                                </state>
                            </next-hop>
                            <state>
                                <route-distinguisher>0</route-distinguisher>
                                <network-address>10.10.10.0/24</network-
address>
                            </state>
                        </route>
                        <route>
                            <route-distinguisher>0</route-distinguisher>
                            <network-address>192.168.122.0</network-address>
                            <next-hop>
                                <next-hop-address>0.0.0.0</next-hop-address>
                                <state>
                                    <next-hop-address>0.0.0.0</next-hop-
address>
                                    <peer-network-weight>32768</peer-network-
weight>
                                    <bgp-as-path-string>Local</bgp-as-path-
string>
                                    <bgp-as-path-4-byte-origin>incomplete</
bgp-as-path-4-byte-origin>
                                    <ibgp-metric-route>0</ibgp-metric-route>
                                    <route-local-preference>100</route-local-
preference>
                                    <last-update-route>2022-12-04T17:50:28Z</
last-update-route>
                                    <reflector-client-route>false</reflector-
client-route>
                                    <route-dampening-active>false</route-
dampening-active>
                                    <history-route>false</history-route>
                                    <nexthop-valid-route>true</nexthop-valid-
route>
                                    <med-flag-type-route>false</med-flag-type-
route>
                                    <valid-route>true</valid-route>
                                    <stale-route>false</stale-route>
                                    <route-type>sourced</route-type>
                                    <ecmp-multi-candidate-route>false</ecmp-
multi-candidate-route>
                                    <multi-installed-route>false</multi-
installed-route>
                                    <atomic-aggregate-route>false</atomic-
aggregate-route>
                                    <selected-route>true</selected-route>
```

```
                                    <bgp-tx-path-id>-1</bgp-tx-path-id>
                                    <bgp-rx-path-id>-1</bgp-rx-path-id>
                                </state>
                            </next-hop>
                            <next-hop>
                                <next-hop-address>10.10.10.11</next-hop-
address>
                                <state>
                                    <next-hop-address>10.10.10.11</next-hop-
address>
                                    <peer-network-weight>32768</peer-network-
weight>
                                    <bgp-as-path-string>Local</bgp-as-path-
string>
                                    <bgp-as-path-4-byte-origin>incomplete</
bgp-as-path-4-byte-origin>
                                    <ibgp-metric-route>0</ibgp-metric-route>
                                    <route-local-preference>100</route-local-
preference>
                                    <last-update-route>2022-12-04T17:50:28Z</
last-update-route>
                                    <reflector-client-route>false</reflector-
client-route>
                                    <route-dampening-active>false</route-
dampening-active>
                                    <history-route>false</history-route>
                                    <nexthop-valid-route>true</nexthop-valid-
route>
                                    <med-flag-type-route>false</med-flag-type-
route>
                                    <valid-route>true</valid-route>
                                    <stale-route>false</stale-route>
                                    <route-type>sourced</route-type>
                                    <ecmp-multi-candidate-route>false</ecmp-
multi-candidate-route>
                                    <multi-installed-route>false</multi-
installed-route>
                                    <atomic-aggregate-route>false</atomic-
aggregate-route>
                                    <selected-route>true</selected-route>
                                    <bgp-tx-path-id>-1</bgp-tx-path-id>
                                    <bgp-rx-path-id>-1</bgp-rx-path-id>
                                </state>
                            </next-hop>
                            <state>
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address>
                            </state>
                        </route>
                    </routes>
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                <address-family>
                    <safi>link-state</safi>
                    <afi>link-state</afi>
                    <state>
                        <safi>link-state</safi>
                        <afi>link-state</afi>
                    </state>
```

```
                </address-family>
            </rib>
            <address-families>
                <address-family>
                    <afi>ipv4</afi>
                    <safi>unicast</safi>
                    <config>
                        <afi>ipv4</afi>
                        <safi>unicast</safi>
                    </config>
                    <state>
                        <afi>ipv4</afi>
                        <safi>unicast</safi>
                    </state>
                    <route-redistribute-lists>
                        <route-redistribute-list>
                            <protocol-type>connected</protocol-type>
                            <config>
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                            </config>
                            <state>
                                <protocol-type>connected</protocol-type>
                            </state>
                        </route-redistribute-list>
                        <route-redistribute-list>
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                            <config>
                                <protocol-type>static</protocol-type>
                            </config>
                            <state>
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                            </state>
                        </route-redistribute-list>
                    </route-redistribute-lists>
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            <peers>
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                            <safi>unicast</safi>
                            <peer-adj-out-route>
                                <network-address>10.10.10.0/24</network-
address>
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address>
                                    <state>
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hop-address>
                                        <peer-network-weight>32768</peer-
network-weight>
                                        <bgp-as-path-string>Local</bgp-as-
path-string>
                                        <bgp-as-path-4-byte-
origin>incomplete</bgp-as-path-4-byte-origin>
```

```
                                        <ibgp-metric-route>0</ibgp-metric-
route>
                                        <route-local-preference>100</route-
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reflector-client-route>
                                        <route-dampening-active>false</route-
dampening-active>
                                        <history-route>false</history-route>
                                        <med-flag-type-route>false</med-flag-
type-route>
                                        <valid-route>true</valid-route>
                                        <stale-route>false</stale-route>
                                        <route-type>sourced</route-type>
                                        <ecmp-multi-candidate-route>false</
ecmp-multi-candidate-route>
                                        <multi-installed-route>false</multi-
installed-route>
                                        <atomic-aggregate-route>false</atomic-
aggregate-route>
                                        <selected-route>true</selected-route>
                                        <bgp-tx-path-id>-1</bgp-tx-path-id>
                                        <bgp-rx-path-id>-1</bgp-rx-path-id>
                                    </state>
                                </next-hop>
                                <state>
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address>
                                </state>
                            </peer-adj-out-route>
                            <peer-adj-out-route>
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address>
                                <next-hop>
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address>
                                    <state>
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hop-address>
                                        <peer-network-weight>32768</peer-
network-weight>
                                        <bgp-as-path-string>Local</bgp-as-
path-string>
                                        <bgp-as-path-4-byte-
origin>incomplete</bgp-as-path-4-byte-origin>
                                        <ibgp-metric-route>0</ibgp-metric-
route>
                                        <route-local-preference>100</route-
local-preference>
                                        <last-update-route>2022-12-
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                                        <reflector-client-route>false</
reflector-client-route>
                                        <route-dampening-active>false</route-
dampening-active>
                                        <history-route>false</history-route>
                                        <med-flag-type-route>false</med-flag-
type-route>
                                        <valid-route>true</valid-route>
```

```
                                        <stale-route>false</stale-route>
                                        <route-type>sourced</route-type>
                                        <ecmp-multi-candidate-route>false</
ecmp-multi-candidate-route>
                                        <multi-installed-route>false</multi-
installed-route>
                                        <atomic-aggregate-route>false</atomic-
aggregate-route>
                                        <selected-route>true</selected-route>
                                        <bgp-tx-path-id>-1</bgp-tx-path-id>
                                        <bgp-rx-path-id>-1</bgp-rx-path-id>
                                    </state>
                                </next-hop>
                                <state>
                                    <network-address>192.168.122.0</network-
address>
                                </state>
                            </peer-adj-out-route>
                            <peer-adj-in-route>
                                <network-address>10.10.10.0/24</network-
address>
                                <next-hop>
                                    <next-hop-address>10.10.10.11</next-hop-
address>
                                    <state>
                                        <next-hop-address>10.10.10.11</next-
hop-address>
                                        <peer-network-weight>0</peer-network-
weight>
                                        <bgp-as-path-string>300</bgp-as-path-
string>
                                        <bgp-as-path-4-byte-
origin>incomplete</bgp-as-path-4-byte-origin>
                                        <ibgp-metric-route>0</ibgp-metric-
route>
                                        <network-remote-address-
route>192.168.122.60</network-remote-address-route>
                                        <route-peer-address>10.10.10.11</
route-peer-address>
                                        <route-local-preference>100</route-
local-preference>
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01T00:00:00Z</last-update-route>
                                        <reflector-client-route>false</
reflector-client-route>
                                        <route-dampening-active>false</route-
dampening-active>
                                        <history-route>false</history-route>
                                        <nexthop-valid-route>false</nexthop-
valid-route>
                                        <med-flag-type-route>false</med-flag-
type-route>
                                        <valid-route>true</valid-route>
                                        <stale-route>false</stale-route>
                                        <route-type>external</route-type>
                                        <ecmp-multi-candidate-route>false</
ecmp-multi-candidate-route>
                                        <multi-installed-route>false</multi-
installed-route>
                                        <atomic-aggregate-route>false</atomic-
aggregate-route>
```

```
                                        <selected-route>true</selected-route>
                                        <bgp-tx-path-id>0</bgp-tx-path-id>
                                        <bgp-rx-path-id>0</bgp-rx-path-id>
                                    </state>
                                </next-hop>
                                <state>
                                    <network-address>10.10.10.0/24</network-
address>
                                </state>
                            </peer-adj-in-route>
                            <peer-adj-in-route>
                                <network-address>192.168.122.0</network-
address>
                                <next-hop>
                                    <next-hop-address>10.10.10.11</next-hop-
address>
                                    <state>
                                        <next-hop-address>10.10.10.11</next-
hop-address>
                                        <peer-network-weight>0</peer-network-
weight>
                                        <bgp-as-path-string>300</bgp-as-path-
string>
                                        <bgp-as-path-4-byte-
origin>incomplete</bgp-as-path-4-byte-origin>
                                        <ibgp-metric-route>0</ibgp-metric-
route>
                                        <network-remote-address-
route>192.168.122.60</network-remote-address-route>
                                        <route-peer-address>10.10.10.11</
route-peer-address>
                                        <route-local-preference>100</route-
local-preference>
                                        <last-update-route>1970-01-
01T00:00:00Z</last-update-route>
                                        <reflector-client-route>false</
reflector-client-route>
                                        <route-dampening-active>false</route-
dampening-active>
                                        <history-route>false</history-route>
                                        <nexthop-valid-route>false</nexthop-
valid-route>
                                        <med-flag-type-route>false</med-flag-
type-route>
                                        <valid-route>true</valid-route>
                                        <stale-route>false</stale-route>
                                        <route-type>external</route-type>
                                        <ecmp-multi-candidate-route>false</
ecmp-multi-candidate-route>
                                        <multi-installed-route>false</multi-
installed-route>
                                        <atomic-aggregate-route>false</atomic-
aggregate-route>
                                        <selected-route>true</selected-route>
                                        <bgp-tx-path-id>0</bgp-tx-path-id>
                                        <bgp-rx-path-id>0</bgp-rx-path-id>
                                    </state>
                                </next-hop>
                                <state>
```

```
                                        <network-address>192.168.122.0</network-
address>
                                    </state>
                                </peer-adj-in-route>
                                <config>
                                    <afi>ipv4</afi>
                                    <safi>unicast</safi>
                                    <activate />
                                    <soft-reconfig-inbound />
                                </config>
                                <state>
                                    <afi>ipv4</afi>
                                    <safi>unicast</safi>
                                    <activate />
                                    <soft-reconfig-inbound />
                                    <community-count>0</community-count>
                                    <address-family-capability>advertise-receive</
address-family-capability>
                                    <ipv6-next-hop-global>::</ipv6-next-hop-
global>
                                    <ipv6-next-hop-local>::</ipv6-next-hop-local>
                                    <remote-port>179</remote-port>
                                    <remote-address>10.10.10.11</remote-address>
                                    <local-host>10.10.10.10</local-host>
                                    <ipv4-next-hop>10.10.10.10</ipv4-next-hop>
                                    <local-port>40394</local-port>
                                    <peer-address-family-table-version>1</peer-
address-family-table-version>
                                    <address-family-table-version>1</address-
family-table-version>
                                    <prefix-count>2</prefix-count>
                                    <send-prefix-count>2</send-prefix-count>
                                    <count>1</count>
                                    <connection-type>non_shared</connection-type>
                                    <connection-established-count>1</connection-
established-count>
                                    <graceful-restart-time>0</graceful-restart-
time>
                                    <bgp-established-up-time>00:02:24</bgp-
established-up-time>
                                    <last-read-time>00:00:23</last-read-time>
                                    <bgp-peer-state>established</bgp-peer-state>
                                    <link-type>external</link-type>
                                    <router-id>192.168.122.60</router-id>
                                    <advertisement-interval>30</advertisement-
interval>
                                    <calculated-hold-time>90</calculated-hold-
time>
                                    <calculated-keepalive>30</calculated-
keepalive>
                                    <route-refresh-capability>advertised-and-
received-old-and-new</route-refresh-capability>
                                    <counters>
                                        <keepalive-in-messages>6</keepalive-in-
messages>
                                        <keepalive-out-messages>6</keepalive-out-
messages>
                                        <open-messages-in>1</open-messages-in>
                                        <open-messages-out>1</open-messages-out>
```

```
                                    <as-path-count>2</as-path-count>
                                    <update-message-in>1</update-message-in>
                                    <update-message-out>1</update-message-out>
                                    <received-packet-count>8</received-packet-
count>
                                    <notification-in>0</notification-in>
                                    <notification-out>0</notification-out>
                                    <packet-in-queue>0</packet-in-queue>
                                    <packet-out-queue>0</packet-out-queue>
                                    <sent-packet-count>8</sent-packet-count>
                                    <refresh-received-packet-count>0</refresh-
received-packet-count>
                                    <refresh-sent-packet-count>0</refresh-
sent-packet-count>
                                </counters>
                            </state>
                            <peer-index>
                                <state>
                                    <peer-index>1</peer-index>
                                    <offset>0</offset>
                                    <mask>0x2</mask>
                                </state>
                            </peer-index>
                        </address-family>
                    </address-families>
                    <config>
                        <peer-address>10.10.10.11</peer-address>
                        <peer-as>300</peer-as>
                    </config>
                    <state>
                        <peer-address>10.10.10.11</peer-address>
                        <peer-as>300</peer-as>
                    </state>
                </peer>
            </peers>
        </bgp-instance>
    </bgp-instances>
</bgp>
```

Validation with NetConf get

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <config>
      <name>default</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
    </config>
    <state>
      <name>default</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
    </state>
    <protocols>
```

```
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</identifier>
        <name>DIRECTLY_CONNECTED</name>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </config>
        <state>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </state>
      </protocol>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>200</name>
        <bgp>
          <global>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
                <state>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </state>
              </afi-safi>
            </afi-safis>
            <config>
              <as>200</as>
            </config>
            <state>
              <as>200</as>
              <total-prefixes>2</total-prefixes>
            </state>
          </global>
          <rib>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
```

```
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <ipv4-unicast>
                  <loc-rib>
                    <routes>
                      <route>
                        <prefix>10.10.10.0/24</prefix>
                        <origin>0.0.0.0</origin>
                        <path-id>0</path-id>
                        <state>
                          <prefix>10.10.10.0/24</prefix>
                          <origin>0.0.0.0</origin>
                          <path-id>0</path-id>
                          <last-modified>1670176228</last-modified>
                          <valid-route>true</valid-route>
                        </state>
                      </route>
                      <route>
                        <prefix>192.168.122.0</prefix>
                        <origin>0.0.0.0</origin>
                        <path-id>0</path-id>
                        <state>
                          <prefix>192.168.122.0</prefix>
                          <origin>0.0.0.0</origin>
                          <path-id>0</path-id>
                          <last-modified>1670176228</last-modified>
                          <valid-route>true</valid-route>
                        </state>
                      </route>
                    </routes>
                  </loc-rib>
                  <neighbors>
                    <neighbor>
                      <neighbor-address>10.10.10.11</neighbor-address>
                      <state>
                        <neighbor-address>10.10.10.11</neighbor-address>
                      </state>
                      <adj-rib-out-post>
                        <routes>
                          <route>
                            <prefix>10.10.10.0/24</prefix>
                            <path-id>0</path-id>
                            <state>
                              <prefix>10.10.10.0/24</prefix>
                              <path-id>0</path-id>
                              <last-modified>1670176228</last-modified>
                              <valid-route>true</valid-route>
                            </state>
                          </route>
                          <route>
                            <prefix>192.168.122.0</prefix>
                            <path-id>0</path-id>
                            <state>
                              <prefix>192.168.122.0</prefix>
                              <path-id>0</path-id>
                              <last-modified>1670176228</last-modified>
                              <valid-route>true</valid-route>
```

```
                        </state>
                      </route>
                    </routes>
                  </adj-rib-out-post>
                  <adj-rib-in-post>
                    <routes>
                      <route>
                        <prefix>10.10.10.0/24</prefix>
                        <path-id>0</path-id>
                        <state>
                          <prefix>10.10.10.0/24</prefix>
                          <path-id>0</path-id>
                          <last-modified>0</last-modified>
                          <valid-route>true</valid-route>
                        </state>
                      </route>
                      <route>
                        <prefix>192.168.122.0</prefix>
                        <path-id>0</path-id>
                        <state>
                          <prefix>192.168.122.0</prefix>
                          <path-id>0</path-id>
                          <last-modified>0</last-modified>
                          <valid-route>true</valid-route>
                        </state>
                      </route>
                    </routes>
                  </adj-rib-in-post>
                </neighbor>
              </neighbors>
            </ipv4-unicast>
            <state>
              <afi-safi-name
                xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
            </state>
          </afi-safi>
        </afi-safis>
      </rib>
      <neighbors>
        <neighbor>
          <neighbor-address>10.10.10.11</neighbor-address>
          <afi-safis>
            <afi-safi>
              <afi-safi-name
                xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
              <config>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
                <enabled>true</enabled>
              </config>
              <state>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV4_UNICAST</afi-safi-name>
```

```
                    <enabled>true</enabled>
                  </state>
                </afi-safi>
              </afi-safis>
              <config>
                <enabled>true</enabled>
                <neighbor-address>10.10.10.11</neighbor-address>
                <peer-as>300</peer-as>
              </config>
              <state>
                <enabled>true</enabled>
                <neighbor-address>10.10.10.11</neighbor-address>
                <peer-as>300</peer-as>
              </state>
            </neighbor>
          </neighbors>
        </bgp>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>200</name>
          <enabled>true</enabled>
        </config>
        <state>
          <enabled>true</enabled>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>200</name>
        </state>
      </protocol>
    </protocols>
    <tables>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </state>
      </table>
```

```
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </state>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </state>
      </table>
    </tables>
    <table-connections>
      <table-connection>
        <src-protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</src-protocol>
        <dst-protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</dst-protocol>
        <address-family
```

```
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <dst-protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</dst-protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
          <dst-instance xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-ni-
augments">200</dst-instance>
          <default-import-policy>ACCEPT_ROUTE</default-import-policy>
          <src-protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</src-protocol>
        </config>
      </table-connection>
      <table-connection>
        <src-protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:STATIC</src-protocol>
        <dst-protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</dst-protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <dst-protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</dst-protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
          <dst-instance xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-ni-
augments">200</dst-instance>
          <default-import-policy>ACCEPT_ROUTE</default-import-policy>
          <src-protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:STATIC</src-protocol>
        </config>
      </table-connection>
    </table-connections>
  </network-instance>
</network-instances>
```

Restrictions

The containers related to RIB are status only on both Open Config and OcNOS datamodels, and there are no configuration related to this.

The containers are available on OcNOS only after the BGP negotiate routers. The tables are empty earlier and cannot be retrieved.

The paths `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safi/afi-safi/ipv4-unicast/loc-rib/routes/route` and `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safi/afi-safi/ipv6-unicast/loc-rib/routes/route` have some keys with fixed values as shown in the below table. Note the “X” indicates it is valid for **IPv4** and **IPv6** containers.

OpenConfig XPath	OcNOS XPath
/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipvX-unicast/loc-rib/routes/route/origin	Use fixed value: • IPV4: “0.0.0.0” • IPV6: “0::0”
/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipvX-unicast/loc-rib/routes/route/path-id	Fixed value “0”
/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipvX-unicast/loc-rib/routes/route/prefix	/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/network-address

BGP RIB Counters IPv6

The BGP RIB (Routing information base) is a set of counters to retrieve information about routes from neighbors. This section gives details on BGP RIB IPv6.

The containers related to RIB are only the status on both Open Config and OcNOS datamodels, and there are no configuration related to this.

On OcNOS, the containers are available only after the BGP negotiate routers, the tables are empty before and cannot be retrieved.

The table below displays information on the CLI:

OcNOS CLI	OcNOS XPath	OpenConfig XPath
show bgp ipv6 neighbors <**IP-address IPv6**> routes	/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop	/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv6-unicast/loc-rib/routes/route
show bgp ipv6 neighbors <**IP-address IPv6**> received-routes	**For default VRF instances**: /ipi-bgp:bgp/bgp-instances/bgp-instance/address-family-vrfs/address-family-vrf/vrf-peers/vrf-peer/peer-adj-in-route/next-hop **For non-default VRF instances**: /ipi-bgp:bgp/bgp-instances/bgp-instance/peers/peer/address-families/address-family/peer-adj-in-route/next-hop	/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv6-unicast/neighbors/neighbor/adj-rib-in-post/routes/route

show bgp ipv6 neighbors <**IP-address IPv6**> advertised-routes	**For default VRF instances**: `/ipi-bgp:bgp/bgp-instances/bgp-instance/address-family-vrfs/address-family-vrf/vrf-peers/vrf-peer/peer-adj-out-route/next-hop` **For non-default VRF instances**: `/ipi-bgp:bgp/bgp-instances/bgp-instance/peers/peer/address-families/address-family/peer-adj-out-route/next-hop`	`/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv6-unicast/neighbors/neighbor/adj-rib-out-post/routes/route`
To get **"last update"** information: show bgp ipv6 <**IP-address IPv6**>	`/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop`	`/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv6-unicast/loc-rib/routes/route`
show bgp ipv6 unicast <**IP-address IPv6>**	`/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop`	`/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv6-unicast/loc-rib/routes/route`
When have user-defined VRF, to get **"last update"** information: show ip bgp vpnv6 vrf <**VRF name>**	`/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop`	`/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv6-unicast/loc-rib/routes/route`
When have user-defined VRF, to get **"last update"** information: show ip bgp vpnv6 vrf <**VRF name**> <**IP-address IPv6**>	`/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop`	`/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv6-unicast/loc-rib/routes/route`
show bgp ipv6 summary	`/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/next-hop`	`/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipv6-unicast/loc-rib/routes/route`

Release

This configuration was introduced in OcNOS version 6.2.

OpenConfig NetConf Payload

N/A

OcNOS CLI Command

The below CLI command is an example to illustrate the indicated counters.

To have a complete BGP RIB scenario, it needs more than one equipment configured to work with BGP.

```
interface eth1
 ipv6 address f0ca::11/48
!
router bgp 200
 neighbor f0ca::10 remote-as 300
 !
 address-family ipv6 unicast
```

```
 redistribute connected
 redistribute static
 neighbor f0ca::10 activate
 neighbor f0ca::10 soft-reconfiguration inbound
 exit-address-family
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to illustrate the BGP RIB Counters IPv6.

```
<bgp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bgp">
    <bgp-instances>
        <bgp-instance>
            <bgp-as>200</bgp-as>
            <config>
                <bgp-as>200</bgp-as>
            </config>
            <state>
                <bgp-as>200</bgp-as>
                <version>4</version>
                <table-version>1</table-version>
                <total-prefixes>0</total-prefixes>
                <router-run-time-ip-address>192.168.122.60</router-run-time-
ip-address>
                <scan-remain-time>38</scan-remain-time>
            </state>
            <rib>
                <address-family>
                    <safi>unicast</safi>
                    <afi>ipv6</afi>
                    <state>
                        <safi>unicast</safi>
                        <afi>ipv6</afi>
                    </state>
                    <routes>
                        <route>
                            <route-distinguisher>0</route-distinguisher>
                            <network-address>b0b0::/64</network-address>
                            <next-hop>
                                <next-hop-address>::</next-hop-address>
                                <state>
                                    <next-hop-address>::</next-hop-address>
                                    <peer-network-weight>32768</peer-network-
weight>
                                    <bgp-as-path-string>Local</bgp-as-path-
string>
                                    <bgp-as-path-4-byte-origin>incomplete</
bgp-as-path-4-byte-origin>
                                    <ibgp-metric-route>0</ibgp-metric-route>
                                    <route-local-preference>100</route-local-
preference>
                                    <last-update-route>2022-11-20T22:42:24Z</
last-update-route>
                                    <reflector-client-route>false</reflector-
client-route>
                                    <route-dampening-active>false</route-
dampening-active>
```

```
                                    <history-route>false</history-route>
                                    <nexthop-valid-route>true</nexthop-valid-
route>
                                    <med-flag-type-route>false</med-flag-type-
route>
                                    <valid-route>true</valid-route>
                                    <stale-route>false</stale-route>
                                    <route-type>sourced</route-type>
                                    <ecmp-multi-candidate-route>false</ecmp-
multi-candidate-route>
                                    <multi-installed-route>false</multi-
installed-route>
                                    <atomic-aggregate-route>false</atomic-
aggregate-route>
                                    <selected-route>true</selected-route>
                                    <bgp-tx-path-id>-1</bgp-tx-path-id>
                                    <bgp-rx-path-id>-1</bgp-rx-path-id>
                                </state>
                            </next-hop>
                            <next-hop>
                                <next-hop-
address>f0ca::10(fe80::5054:ff:fe78:1f3)</next-hop-address>
                                <state>
                                    <next-hop-
address>f0ca::10(fe80::5054:ff:fe78:1f3)</next-hop-address>
                                    <peer-network-weight>32768</peer-network-
weight>
                                    <bgp-as-path-string>Local</bgp-as-path-
string>
                                    <bgp-as-path-4-byte-origin>incomplete</
bgp-as-path-4-byte-origin>
                                    <ibgp-metric-route>0</ibgp-metric-route>
                                    <route-local-preference>100</route-local-
preference>
                                    <last-update-route>2022-11-20T22:42:24Z</
last-update-route>
                                    <reflector-client-route>false</reflector-
client-route>
                                    <route-dampening-active>false</route-
dampening-active>
                                    <history-route>false</history-route>
                                    <nexthop-valid-route>true</nexthop-valid-
route>
                                    <med-flag-type-route>false</med-flag-type-
route>
                                    <valid-route>true</valid-route>
                                    <stale-route>false</stale-route>
                                    <route-type>sourced</route-type>
                                    <ecmp-multi-candidate-route>false</ecmp-
multi-candidate-route>
                                    <multi-installed-route>false</multi-
installed-route>
                                    <atomic-aggregate-route>false</atomic-
aggregate-route>
                                    <selected-route>true</selected-route>
                                    <bgp-tx-path-id>-1</bgp-tx-path-id>
                                    <bgp-rx-path-id>-1</bgp-rx-path-id>
                                </state>
                            </next-hop>
                            <state>
```

```
                                <route-distinguisher>0</route-distinguisher>
                                <network-address>b0b0::/64</network-address>
                            </state>
                        </route>
                        <route>
                            <route-distinguisher>0</route-distinguisher>
                            <network-address>f0ca::/24</network-address>
                            <next-hop>
                                <next-hop-
address>f0ca::10(fe80::5054:ff:fe78:1f3)</next-hop-address>
                                <state>
                                    <next-hop-
address>f0ca::10(fe80::5054:ff:fe78:1f3)</next-hop-address>
                                    <peer-network-weight>0</peer-network-
weight>
                                    <bgp-med-value>0</bgp-med-value>
                                    <bgp-as-path-string>300</bgp-as-path-
string>
                                    <bgp-as-path-4-byte-origin>incomplete</
bgp-as-path-4-byte-origin>
                                    <ibgp-metric-route>0</ibgp-metric-route>
                                    <network-remote-address-
route>192.168.122.52</network-remote-address-route>
                                    <originator-id-route>192.168.122.52</
originator-id-route>
                                    <route-peer-address>f0ca::10</route-peer-
address>
                                    <route-local-preference>100</route-local-
preference>
                                    <last-update-route>2022-11-20T22:43:26Z</
last-update-route>
                                    <reflector-client-route>false</reflector-
client-route>
                                    <route-dampening-active>false</route-
dampening-active>
                                    <history-route>false</history-route>
                                    <nexthop-valid-route>true</nexthop-valid-
route>
                                    <med-flag-type-route>false</med-flag-type-
route>
                                    <valid-route>true</valid-route>
                                    <stale-route>false</stale-route>
                                    <route-type>external</route-type>
                                    <ecmp-multi-candidate-route>false</ecmp-
multi-candidate-route>
                                    <multi-installed-route>false</multi-
installed-route>
                                    <atomic-aggregate-route>false</atomic-
aggregate-route>
                                    <selected-route>true</selected-route>
                                    <bgp-tx-path-id>-1</bgp-tx-path-id>
                                    <bgp-rx-path-id>-1</bgp-rx-path-id>
                                </state>
                            </next-hop>
                            <state>
                                <route-distinguisher>0</route-distinguisher>
                                <network-address>f0ca::/24</network-address>
                            </state>
                        </route>
                        <route>
```

```
                                <route-distinguisher>0</route-distinguisher>
                                <network-address>f0ca::/48</network-address>
                                <next-hop>
                                    <next-hop-address>::</next-hop-address>
                                    <state>
                                        <next-hop-address>::</next-hop-address>
                                        <peer-network-weight>32768</peer-network-
weight>
                                        <bgp-as-path-string>Local</bgp-as-path-
string>
                                        <bgp-as-path-4-byte-origin>incomplete</
bgp-as-path-4-byte-origin>
                                        <ibgp-metric-route>0</ibgp-metric-route>
                                        <route-local-preference>100</route-local-
preference>
                                        <last-update-route>2022-11-20T22:42:24Z</
last-update-route>
                                        <reflector-client-route>false</reflector-
client-route>
                                        <route-dampening-active>false</route-
dampening-active>
                                        <history-route>false</history-route>
                                        <nexthop-valid-route>true</nexthop-valid-
route>
                                        <med-flag-type-route>false</med-flag-type-
route>
                                        <valid-route>true</valid-route>
                                        <stale-route>false</stale-route>
                                        <route-type>sourced</route-type>
                                        <ecmp-multi-candidate-route>false</ecmp-
multi-candidate-route>
                                        <multi-installed-route>false</multi-
installed-route>
                                        <atomic-aggregate-route>false</atomic-
aggregate-route>
                                        <selected-route>true</selected-route>
                                        <bgp-tx-path-id>-1</bgp-tx-path-id>
                                        <bgp-rx-path-id>-1</bgp-rx-path-id>
                                    </state>
                                </next-hop>
                                <state>
                                    <route-distinguisher>0</route-distinguisher>
                                    <network-address>f0ca::/48</network-address>
                                </state>
                            </route>
                        </routes>
                    </address-family>
                    <address-family>
                        <safi>link-state</safi>
                        <afi>link-state</afi>
                        <state>
                            <safi>link-state</safi>
                            <afi>link-state</afi>
                        </state>
                    </address-family>
                </rib>
                <address-families>
                    <address-family>
                        <afi>ipv6</afi>
```

```
                    <safi>unicast</safi>
                    <config>
                        <afi>ipv6</afi>
                        <safi>unicast</safi>
                    </config>
                    <state>
                        <afi>ipv6</afi>
                        <safi>unicast</safi>
                    </state>
                    <route-redistribute-lists>
                        <route-redistribute-list>
                            <protocol-type>connected</protocol-type>
                            <config>
                                <protocol-type>connected</protocol-type>
                            </config>
                            <state>
                                <protocol-type>connected</protocol-type>
                            </state>
                        </route-redistribute-list>
                        <route-redistribute-list>
                            <protocol-type>static</protocol-type>
                            <config>
                                <protocol-type>static</protocol-type>
                            </config>
                            <state>
                                <protocol-type>static</protocol-type>
                            </state>
                        </route-redistribute-list>
                    </route-redistribute-lists>
                </address-family>
            </address-families>
            <peers>
                <peer>
                    <peer-address>f0ca::10</peer-address>
                    <address-families>
                        <address-family>
                            <afi>ipv6</afi>
                            <safi>unicast</safi>
                            <peer-adj-out-route>
                                <network-address>b0b0::/64</network-address>
                                <next-hop>
                                    <next-hop-
address>f0ca::11(fe80::5054:ff:fed0:8295)</next-hop-address>
                                    <state>
                                        <next-hop-
address>f0ca::11(fe80::5054:ff:fed0:8295)</next-hop-address>
                                        <peer-network-weight>32768</peer-
network-weight>
                                        <bgp-as-path-string>Local</bgp-as-
path-string>
                                        <bgp-as-path-4-byte-
origin>incomplete</bgp-as-path-4-byte-origin>
                                        <ibgp-metric-route>0</ibgp-metric-
route>
                                        <route-local-preference>100</route-
local-preference>
                                        <last-update-route>2022-11-
20T22:42:24Z</last-update-route>
```

```
                                        <reflector-client-route>false</
reflector-client-route>
                                        <route-dampening-active>false</route-
dampening-active>
                                        <history-route>false</history-route>
                                        <med-flag-type-route>false</med-flag-
type-route>
                                        <valid-route>true</valid-route>
                                        <stale-route>false</stale-route>
                                        <route-type>sourced</route-type>
                                        <ecmp-multi-candidate-route>false</
ecmp-multi-candidate-route>
                                        <multi-installed-route>false</multi-
installed-route>
                                        <atomic-aggregate-route>false</atomic-
aggregate-route>
                                        <selected-route>true</selected-route>
                                        <bgp-tx-path-id>-1</bgp-tx-path-id>
                                        <bgp-rx-path-id>-1</bgp-rx-path-id>
                                    </state>
                                </next-hop>
                                <state>
                                    <network-address>b0b0::/64</network-
address>
                                </state>
                            </peer-adj-out-route>
                            <peer-adj-out-route>
                                <network-address>f0ca::/48</network-address>
                                <next-hop>
                                    <next-hop-
address>f0ca::11(fe80::5054:ff:fed0:8295)</next-hop-address>
                                    <state>
                                        <next-hop-
address>f0ca::11(fe80::5054:ff:fed0:8295)</next-hop-address>
                                        <peer-network-weight>32768</peer-
network-weight>
                                        <bgp-as-path-string>Local</bgp-as-
path-string>
                                        <bgp-as-path-4-byte-
origin>incomplete</bgp-as-path-4-byte-origin>
                                        <ibgp-metric-route>0</ibgp-metric-
route>
                                        <route-local-preference>100</route-
local-preference>
                                        <last-update-route>2022-11-
20T22:42:24Z</last-update-route>
                                        <reflector-client-route>false</
reflector-client-route>
                                        <route-dampening-active>false</route-
dampening-active>
                                        <history-route>false</history-route>
                                        <med-flag-type-route>false</med-flag-
type-route>
                                        <valid-route>true</valid-route>
                                        <stale-route>false</stale-route>
                                        <route-type>sourced</route-type>
                                        <ecmp-multi-candidate-route>false</
ecmp-multi-candidate-route>
                                        <multi-installed-route>false</multi-
installed-route>
```

```
                                        <atomic-aggregate-route>false</atomic-
aggregate-route>
                                        <selected-route>true</selected-route>
                                        <bgp-tx-path-id>-1</bgp-tx-path-id>
                                        <bgp-rx-path-id>-1</bgp-rx-path-id>
                                    </state>
                                </next-hop>
                                <state>
                                    <network-address>f0ca::/48</network-
address>
                                </state>
                            </peer-adj-out-route>
                            <peer-adj-in-route>
                                <network-address>b0b0::/64</network-address>
                                <next-hop>
                                    <next-hop-
address>f0ca::10(fe80::5054:ff:fe78:1f3)</next-hop-address>
                                    <state>
                                        <next-hop-
address>f0ca::10(fe80::5054:ff:fe78:1f3)</next-hop-address>
                                        <peer-network-weight>0</peer-network-
weight>
                                        <bgp-as-path-string>300</bgp-as-path-
string>
                                        <bgp-as-path-4-byte-
origin>incomplete</bgp-as-path-4-byte-origin>
                                        <ibgp-metric-route>0</ibgp-metric-
route>
                                        <network-remote-address-
route>192.168.122.52</network-remote-address-route>
                                        <route-peer-address>f0ca::10</route-
peer-address>
                                        <route-local-preference>100</route-
local-preference>
                                        <last-update-route>1970-01-
01T00:00:00Z</last-update-route>
                                        <reflector-client-route>false</
reflector-client-route>
                                        <route-dampening-active>false</route-
dampening-active>
                                        <history-route>false</history-route>
                                        <nexthop-valid-route>false</nexthop-
valid-route>
                                        <med-flag-type-route>false</med-flag-
type-route>
                                        <valid-route>true</valid-route>
                                        <stale-route>false</stale-route>
                                        <route-type>external</route-type>
                                        <ecmp-multi-candidate-route>false</
ecmp-multi-candidate-route>
                                        <multi-installed-route>false</multi-
installed-route>
                                        <atomic-aggregate-route>false</atomic-
aggregate-route>
                                        <selected-route>true</selected-route>
                                        <bgp-tx-path-id>0</bgp-tx-path-id>
                                        <bgp-rx-path-id>0</bgp-rx-path-id>
                                    </state>
                                </next-hop>
                                <state>
```

```
                                        <network-address>b0b0::/64</network-
address>
                                    </state>
                                </peer-adj-in-route>
                                <peer-adj-in-route>
                                    <network-address>f0ca::/24</network-address>
                                    <next-hop>
                                        <next-hop-
address>f0ca::10(fe80::5054:ff:fe78:1f3)</next-hop-address>
                                        <state>
                                            <next-hop-
address>f0ca::10(fe80::5054:ff:fe78:1f3)</next-hop-address>
                                            <peer-network-weight>0</peer-network-
weight>
                                            <bgp-as-path-string>300</bgp-as-path-
string>
                                            <bgp-as-path-4-byte-
origin>incomplete</bgp-as-path-4-byte-origin>
                                            <ibgp-metric-route>0</ibgp-metric-
route>
                                            <network-remote-address-
route>192.168.122.52</network-remote-address-route>
                                            <route-peer-address>f0ca::10</route-
peer-address>
                                            <route-local-preference>100</route-
local-preference>
                                            <last-update-route>1970-01-
01T00:00:00Z</last-update-route>
                                            <reflector-client-route>false</
reflector-client-route>
                                            <route-dampening-active>false</route-
dampening-active>
                                            <history-route>false</history-route>
                                            <nexthop-valid-route>false</nexthop-
valid-route>
                                            <med-flag-type-route>false</med-flag-
type-route>
                                            <valid-route>true</valid-route>
                                            <stale-route>false</stale-route>
                                            <route-type>external</route-type>
                                            <ecmp-multi-candidate-route>false</
ecmp-multi-candidate-route>
                                            <multi-installed-route>false</multi-
installed-route>
                                            <atomic-aggregate-route>false</atomic-
aggregate-route>
                                            <selected-route>true</selected-route>
                                            <bgp-tx-path-id>0</bgp-tx-path-id>
                                            <bgp-rx-path-id>0</bgp-rx-path-id>
                                        </state>
                                    </next-hop>
                                    <state>
                                        <network-address>f0ca::/24</network-
address>
                                    </state>
                                </peer-adj-in-route>
                                <config>
                                    <afi>ipv6</afi>
                                    <safi>unicast</safi>
                                    <activate />
```

```
                                <soft-reconfig-inbound />
                            </config>
                            <state>
                                <afi>ipv6</afi>
                                <safi>unicast</safi>
                                <activate />
                                <soft-reconfig-inbound />
                                <community-count>0</community-count>
                                <ipv6-next-hop-global>f0ca::11</ipv6-next-hop-
global>
                                <ipv6-next-hop-local>fe80::5054:ff:fed0:8295</
ipv6-next-hop-local>
                                <remote-port>54786</remote-port>
                                <remote-address>f0ca::10</remote-address>
                                <local-host>f0ca::11</local-host>
                                <ipv4-next-hop>192.168.122.60</ipv4-next-hop>
                                <local-port>179</local-port>
                                <peer-address-family-table-version>2</peer-
address-family-table-version>
                                <address-family-table-version>2</address-
family-table-version>
                                <prefix-count>2</prefix-count>
                                <send-prefix-count>2</send-prefix-count>
                                <count>1</count>
                                <connection-type>shared</connection-type>
                                <connection-established-count>1</connection-
established-count>
                                <graceful-restart-time>0</graceful-restart-
time>
                                <bgp-established-up-time>00:00:33</bgp-
established-up-time>
                                <last-read-time>00:00:05</last-read-time>
                                <bgp-peer-state>established</bgp-peer-state>
                                <link-type>external</link-type>
                                <router-id>192.168.122.52</router-id>
                                <advertisement-interval>30</advertisement-
interval>
                                <calculated-hold-time>90</calculated-hold-
time>
                                <calculated-keepalive>30</calculated-
keepalive>
                                <route-refresh-capability>advertised-and-
received-old-and-new</route-refresh-capability>
                                <capability-ipv6-unicast>advertised-and-
received</capability-ipv6-unicast>
                                <counters>
                                    <keepalive-in-messages>2</keepalive-in-
messages>
                                    <keepalive-out-messages>2</keepalive-out-
messages>
                                    <open-messages-in>1</open-messages-in>
                                    <open-messages-out>2</open-messages-out>
                                    <as-path-count>2</as-path-count>
                                    <update-message-in>1</update-message-in>
                                    <update-message-out>1</update-message-out>
                                    <received-packet-count>4</received-packet-
count>
                                    <notification-in>0</notification-in>
                                    <notification-out>0</notification-out>
```

```
                                        <packet-in-queue>0</packet-in-queue>
                                        <packet-out-queue>0</packet-out-queue>
                                        <sent-packet-count>5</sent-packet-count>
                                        <refresh-received-packet-count>0</refresh-
received-packet-count>
                                        <refresh-sent-packet-count>0</refresh-
sent-packet-count>
                                    </counters>
                                </state>
                                <peer-index>
                                    <state>
                                        <peer-index>1</peer-index>
                                        <offset>0</offset>
                                        <mask>0x2</mask>
                                    </state>
                                </peer-index>
                            </address-family>
                        </address-families>
                        <config>
                            <peer-address>f0ca::10</peer-address>
                            <peer-as>300</peer-as>
                        </config>
                        <state>
                            <peer-address>f0ca::10</peer-address>
                            <peer-as>300</peer-as>
                        </state>
                    </peer>
                </peers>
            </bgp-instance>
        </bgp-instances>
</bgp>
```

Validation with NetConf get

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <config>
      <name>default</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
    </config>
    <state>
      <name>default</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
    </state>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</identifier>
        <name>DIRECTLY_CONNECTED</name>
        <config>
          <identifier
```

```
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </config>
        <state>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </state>
      </protocol>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</identifier>
        <name>200</name>
        <bgp>
          <global>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                <config>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </config>
                <state>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                  <enabled>true</enabled>
                </state>
              </afi-safi>
            </afi-safis>
            <config>
              <as>200</as>
            </config>
            <state>
              <as>200</as>
              <total-prefixes>0</total-prefixes>
            </state>
          </global>
          <rib>
            <afi-safis>
              <afi-safi>
                <afi-safi-name
                  xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                <ipv6-unicast>
                  <loc-rib>
                    <routes>
                      <route>
                        <prefix>b0b0::/64</prefix>
```

```
          <origin>0::0</origin>
          <path-id>0</path-id>
          <state>
            <prefix>b0b0::/64</prefix>
            <origin>0.0.0.0</origin>
            <path-id>0</path-id>
            <last-modified>1668984144</last-modified>
            <valid-route>true</valid-route>
          </state>
        </route>
        <route>
          <prefix>f0ca::/24</prefix>
          <origin>0::0</origin>
          <path-id>0</path-id>
          <state>
            <prefix>f0ca::/24</prefix>
            <origin>0.0.0.0</origin>
            <path-id>0</path-id>
            <last-modified>1668984206</last-modified>
            <valid-route>true</valid-route>
          </state>
        </route>
        <route>
          <prefix>f0ca::/48</prefix>
          <origin>0::0</origin>
          <path-id>0</path-id>
          <state>
            <prefix>f0ca::/48</prefix>
            <origin>0.0.0.0</origin>
            <path-id>0</path-id>
            <last-modified>1668984144</last-modified>
            <valid-route>true</valid-route>
          </state>
        </route>
      </routes>
    </loc-rib>
    <neighbors>
      <neighbor>
        <neighbor-address>f0ca::10</neighbor-address>
        <state>
          <neighbor-address>f0ca::10</neighbor-address>
        </state>
        <adj-rib-out-post>
          <routes>
            <route>
              <prefix>b0b0::/64</prefix>
              <path-id>0</path-id>
              <state>
                <prefix>b0b0::/64</prefix>
                <path-id>0</path-id>
                <last-modified>1668984144</last-modified>
                <valid-route>true</valid-route>
              </state>
            </route>
            <route>
              <prefix>f0ca::/48</prefix>
              <path-id>0</path-id>
```

```
                            <state>
                              <prefix>f0ca::/48</prefix>
                              <path-id>0</path-id>
                              <last-modified>1668984144</last-modified>
                              <valid-route>true</valid-route>
                            </state>
                          </route>
                        </routes>
                      </adj-rib-out-post>
                      <adj-rib-in-post>
                        <routes>
                          <route>
                            <prefix>b0b0::/64</prefix>
                            <path-id>0</path-id>
                            <state>
                              <prefix>b0b0::/64</prefix>
                              <path-id>0</path-id>
                              <last-modified>0</last-modified>
                              <valid-route>true</valid-route>
                            </state>
                          </route>
                          <route>
                            <prefix>f0ca::/24</prefix>
                            <path-id>0</path-id>
                            <state>
                              <prefix>f0ca::/24</prefix>
                              <path-id>0</path-id>
                              <last-modified>0</last-modified>
                              <valid-route>true</valid-route>
                            </state>
                          </route>
                        </routes>
                      </adj-rib-in-post>
                    </neighbor>
                  </neighbors>
                </ipv6-unicast>
                <state>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                </state>
              </afi-safi>
            </afi-safis>
          </rib>
          <neighbors>
            <neighbor>
              <neighbor-address>f0ca::10</neighbor-address>
              <afi-safis>
                <afi-safi>
                  <afi-safi-name
                    xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                  <config>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
```

```
                  </config>
                  <state>
                    <afi-safi-name
                      xmlns:oc-bgp-types="http://openconfig.net/yang/bgp-
types">oc-bgp-types:IPV6_UNICAST</afi-safi-name>
                    <enabled>true</enabled>
                  </state>
                </afi-safi>
              </afi-safis>
              <config>
                <enabled>true</enabled>
                <neighbor-address>f0ca::10</neighbor-address>
                <peer-as>300</peer-as>
              </config>
              <state>
                <enabled>true</enabled>
                <neighbor-address>f0ca::10</neighbor-address>
                <peer-as>300</peer-as>
              </state>
            </neighbor>
          </neighbors>
        </bgp>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>200</name>
          <enabled>true</enabled>
        </config>
        <state>
          <enabled>true</enabled>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</identifier>
          <name>200</name>
        </state>
      </protocol>
    </protocols>
    <tables>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
```

```
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </state>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </state>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </state>
      </table>
    </tables>
    <interfaces>
      <interface>
        <id>eth0</id>
        <config>
          <id>eth0</id>
```

```
    <interface>eth0</interface>
  </config>
</interface>
<interface>
  <id>eth1</id>
  <config>
    <id>eth1</id>
    <interface>eth1</interface>
  </config>
</interface>
<interface>
  <id>eth2</id>
  <config>
    <id>eth2</id>
    <interface>eth2</interface>
  </config>
</interface>
<interface>
  <id>eth3</id>
  <config>
    <id>eth3</id>
    <interface>eth3</interface>
  </config>
</interface>
<interface>
  <id>eth4</id>
  <config>
    <id>eth4</id>
    <interface>eth4</interface>
  </config>
</interface>
<interface>
  <id>eth5</id>
  <config>
    <id>eth5</id>
    <interface>eth5</interface>
  </config>
</interface>
<interface>
  <id>eth6</id>
  <config>
    <id>eth6</id>
    <interface>eth6</interface>
  </config>
</interface>
<interface>
  <id>eth7</id>
  <config>
    <id>eth7</id>
    <interface>eth7</interface>
  </config>
</interface>
<interface>
  <id>eth8</id>
  <config>
    <id>eth8</id>
    <interface>eth8</interface>
```

```
        </config>
      </interface>
      <interface>
        <id>lo</id>
        <config>
          <id>lo</id>
          <interface>lo</interface>
        </config>
      </interface>
    </interfaces>
    <table-connections>
      <table-connection>
        <src-protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</src-protocol>
        <dst-protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</dst-protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <dst-protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</dst-protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
          <dst-instance xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-ni-
augments">200</dst-instance>
          <default-import-policy>ACCEPT_ROUTE</default-import-policy>
          <src-protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</src-protocol>
        </config>
      </table-connection>
      <table-connection>
        <src-protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:STATIC</src-protocol>
        <dst-protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:BGP</dst-protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <dst-protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:BGP</dst-protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
          <dst-instance xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-ni-
augments">200</dst-instance>
          <default-import-policy>ACCEPT_ROUTE</default-import-policy>
          <src-protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:STATIC</src-protocol>
```

```
        </config>
      </table-connection>
    </table-connections>
  </network-instance>
  <network-instance>
    <name>management</name>
    <config>
      <name>management</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
    </config>
    <state>
      <name>management</name>
      <type
        xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
    </state>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</identifier>
        <name>DIRECTLY_CONNECTED</name>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </config>
        <state>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <enabled>true</enabled>
        </state>
      </protocol>
    </protocols>
    <tables>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </config>
        <state>
          <protocol
```

```
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        </state>
      </table>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:DIRECTLY_CONNECTED</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </config>
        <state>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
        </state>
      </table>
    </tables>
  </network-instance>
</network-instances>
```

Restrictions

The containers related to RIB are status only on both OpenConfig and OcNOS datamodels, and there are no configuration related to this.

The containers are available on OcNOS only after the BGP negotiate routers. The tables are empty earlier and cannot be retrieved.

The paths `/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safi/afi-safi/ipv4-unicast/loc-rib/routes/route and /oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safi/afi-safi/ipv6-unicast/loc-rib/routes/route` have some keys with fixed values, the table below show the values. Note the “X” indicates it is valid for **IPv4** and **IPv6** containers.

OpenConfig XPath	OcNOS XPath
`/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipvX-unicast/loc-rib/routes/route/origin`	Use fixed value: • IPV4: “0.0.0.0” • IPV6: “0::0”

/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipvX-unicast/loc-rib/routes/route/path-id	Fixed value “0”
/oc-netinst:network-instances/network-instance/protocols/protocol/bgp/rib/afi-safis/afi-safi/ipvX-unicast/loc-rib/routes/route/prefix	/ipi-bgp:bgp/bgp-instances/bgp-instance/rib/address-family/routes/route/network-address

OSPFv2 Openconfig Translation

Create OSPF Process

This XML configuration snippet is used to create OSPF process.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to create OSPF process.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
    <interface>
        <name>xe2</name>
        <config>
            <name>xe2</name>
            <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <subinterfaces>
            <subinterface>
                <index>0</index>
                <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
                    <addresses>
                        <address>
                            <ip>10.10.10.1</ip>
                            <config>
                                <ip>10.10.10.1</ip>
                                <prefix-length>24</prefix-length>
                            </config>
                        </address>
                    </addresses>
                </ipv4>
                <config>
                    <index>0</index>
                </config>
            </subinterface>
        </subinterfaces>
    </interface>
</interfaces>
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
        <name>default</name>
        <protocols>
            <protocol xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">
```

```
                <identifier>oc-pol-types:OSPF</identifier>
                <name>100</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:OSPF</identifier>
                    <name>100</name>
                    <enabled>true</enabled>
                </config>
                <ospfv2>
                    <global>
                        <config>
                            <router-id>2.2.2.2</router-id>
                        </config>
                    </global>
                    <areas>
                        <area>
                            <identifier>0.0.0.0</identifier>
                            <config>
                                <identifier>0.0.0.0</identifier>
                            </config>
                            <interfaces>
                                <interface>
                                    <id>xe2</id>
                                    <config>
                                        <id>xe2</id>
                                        <network-type xmlns:oc-ospf-
types="http://openconfig.net/yang/ospf-types">oc-ospf-
types:NON_BROADCAST_NETWORK</network-type>
                                        <passive>true</passive>
                                        <authentication-type>simple</
authentication-type>
                                    </config>
                                    <interface-ref>
                                        <config>
                                            <interface>xe2</interface>
                                        </config>
                                    </interface-ref>
                                </interface>
                            </interfaces>
                        </area>
                    </areas>
                </ospfv2>
            </protocol>
        </protocols>
    </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to create OSPF process.

```
ospf area-interface-config-mode
router ospf 100
 ospf router-id 2.2.2.2
 area 0.0.0.0 interface xe2
 area 0.0.0.0 interface xe2 passive
 area 0.0.0.0 interface xe2 network-type non-broadcast
```

```
 area 0.0.0.0 interface xe2 authentication
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create OSPF process.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe2</name>
        <config>
            <name>xe2</name>
        </config>
        <ipv4 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-ip">
            <config>
                <primary-ip-addr>10.10.10.1/24</primary-ip-addr>
            </config>
        </ipv4>
    </interface>
</interfaces>
<network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">
    <network-instance>
        <instance-name>default</instance-name>
        <config>
            <instance-name>default</instance-name>
            <instance-type>vrf</instance-type>
        </config>
        <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
            <config>
                <vrf-name>default</vrf-name>
            </config>
        </vrf>
        <bridge xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bridge">
            <config>
                <protocol>ieee-vlan-bridge</protocol>
            </config>
        </bridge>
    </network-instance>
</network-instances>
<ospfv2 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-ospf">
    <processes>
        <process>
            <ospf-id>100</ospf-id>
            <config>
                <router-id>2.2.2.2</router-id>
                <ospf-id>100</ospf-id>
                <vrf-name>default</vrf-name>
            </config>
            <areas>
                <area>
                    <area-id>0.0.0.0</area-id>
                    <config>
                        <area-id>0.0.0.0</area-id>
                    </config>
                    <interfaces>
                        <interface>
```

```
                            <name>xe2</name>
                            <config>
                                <name>xe2</name>
                                <network-type>non-broadcast</network-type>
                                <passive />
                                <authentication-type>simple</authentication-
type>
                            </config>
                        </interface>
                    </interfaces>
                </area>
            </areas>
        </process>
    </processes>
    <global>
        <config>
            <area-interface-config-mode />
        </config>
    </global>
</ospfv2>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating OSPF process.

```
    <network-instances xmlns="http://openconfig.net/yang/network-instance">
      <network-instance>
        <name>default</name>
        <config>
          <name>default</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
        </config>
        <protocols>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:OSPF</identifier>
            <name>100</name>
            <ospfv2>
              <global>
                <config>
                  <router-id>2.2.2.2</router-id>
                </config>
              </global>
              <areas>
                <area>
                  <identifier>0.0.0.0</identifier>
                  <config>
                    <identifier>0.0.0.0</identifier>
                  </config>
                  <state>
                    <identifier>0.0.0.0</identifier>
                  </state>
                  <interfaces>
                    <interface>
```

```
                        <id>xe2</id>
                        <config>
                          <id>xe2</id>
                          <network-type
                            xmlns:oc-ospf-types="http://openconfig.net/yang/
ospf-types">oc-ospf-types:NON_BROADCAST_NETWORK</network-type>
                          <passive>true</passive>
                          <authentication-type>simple</authentication-type>
                        </config>
                        <interface-ref>
                          <config>
                            <interface>xe2</interface>
                          </config>
                        </interface-ref>
                        <state>
                          <id>xe2</id>
                          <network-type
                            xmlns:oc-ospf-types="http://openconfig.net/yang/
ospf-types">oc-ospf-types:NON_BROADCAST_NETWORK</network-type>
                          <passive>true</passive>
                          <authentication-type>simple</authentication-type>
                        </state>
                      </interface>
                    </interfaces>
                  </area>
                </areas>
              </ospfv2>
              <config>
                <identifier
                  xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:OSPF</identifier>
                <name>100</name>
                <enabled>true</enabled>
              </config>
            </protocol>
          </protocols>
          <tables>
            <table>
              <protocol
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:OSPF</protocol>
              <address-family
                xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
              <config>
                <protocol
                  xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:OSPF</protocol>
                <address-family
                  xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV4</address-family>
              </config>
            </table>
          </tables>
        </network-instance>
        <network-instance>
          <name>management</name>
          <config>
```

```
            <name>management</name>
            <type
              xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
          </config>
        </network-instance>
      </network-instances>
```

Restrictions

Area `/network-instances/network-instance/protocols/protocol/ospfv2/areas/area`

must always be set with at least one interface `/network-instances/network-instance/protocols/protocol/ospfv2/areas/area/interfaces/interface`.

Create OSPF Process

This XML configuration snippet is used to create OSPF process.

Release

This configuration was introduced in OcNOS version 6.3.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to create OSPF process.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
        <interface>
            <name>eth1</name>
            <config>
                <name>eth1</name>
                <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
            </config>
            <subinterfaces>
                <subinterface>
                    <index>0</index>
                    <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
                        <addresses>
                            <address>
                                <ip>10.10.10.1</ip>
                                <config>
                                    <ip>10.10.10.1</ip>
                                    <prefix-length>24</prefix-length>
                                </config>
                            </address>
                        </addresses>
                    </ipv4>
                    <config>
                        <index>0</index>
                    </config>
                </subinterface>
            </subinterfaces>
```

```
    </interface>
    <interface>
        <name>eth2</name>
        <config>
            <name>eth2</name>
            <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <subinterfaces>
            <subinterface>
                <index>0</index>
                <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
                    <addresses>
                        <address>
                            <ip>20.20.20.1</ip>
                            <config>
                                <ip>20.20.20.1</ip>
                                <prefix-length>24</prefix-length>
                            </config>
                        </address>
                    </addresses>
                </ipv4>
                <config>
                    <index>0</index>
                </config>
            </subinterface>
        </subinterfaces>
    </interface>
</interfaces>
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
        <name>default</name>
        <protocols>
            <protocol xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">
                <identifier>oc-pol-types:OSPF</identifier>
                <name>100</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:OSPF</identifier>
                    <name>100</name>
                    <enabled>true</enabled>
                </config>
                <ospfv2>
                    <global>
                        <config>
                            <router-id>1.1.1.1</router-id>
                            <log-adjacency-changes>true</log-adjacency-
changes>
                            <summary-route-cost-mode>RFC1583_COMPATIBLE</
summary-route-cost-mode>
                        </config>
                        <mpls>
                            <config>
                                <traffic-engineering-extensions>false</
traffic-engineering-extensions>
                            </config>
                        </mpls>
```

```
                        <graceful-restart>
                            <config>
                                <enabled>false</enabled>
                            </config>
                        </graceful-restart>
                        <timers>
                            <max-metric>
                                <config>
                                    <set>true</set>
                                    <include>MAX_METRIC_INCLUDE_STUB</include>
                                </config>
                            </max-metric>
                            <lsa-generation>
                                <config>
                                    <initial-delay>100</initial-delay>
                                    <maximum-delay>100</maximum-delay>
                                </config>
                            </lsa-generation>
                            <spf>
                                <config>
                                    <initial-delay>400</initial-delay>
                                    <maximum-delay>4000</maximum-delay>
                                </config>
                            </spf>
                        </timers>
                    </global>
                    <areas>
                        <area>
                            <identifier>0.0.0.0</identifier>
                            <config>
                                <identifier>0.0.0.0</identifier>
                            </config>
                            <interfaces>
                                <interface>
                                    <id>eth1</id>
                                    <config>
                                        <id>eth1</id>
                                        <passive>true</passive>
                                        <priority>255</priority>
                                        <network-type xmlns:oc-ospf-
types="http://openconfig.net/yang/ospf-types">oc-ospf-
types:POINT_TO_POINT_NETWORK</network-type>
                                        <authentication-type>message-digest</
authentication-type>
                                        <metric>65535</metric>
                                    </config>
                                    <interface-ref>
                                        <config>
                                            <interface>eth1</interface>
                                        </config>
                                    </interface-ref>
                                    <enable-bfd>
                                        <config>
                                            <enabled>true</enabled>
                                        </config>
                                    </enable-bfd>
                                    <lsa-filter>
```

```
                                        <config>
                                            <all>true</all>
                                        </config>
                                    </lsa-filter>
                                    <mpls>
                                        <config>
                                            <traffic-engineering-metric>1</
traffic-engineering-metric>
                                        </config>
                                        <igp-ldp-sync>
                                            <config>
                                                <enabled>true</enabled>
                                                <post-session-up-delay>1000</
post-session-up-delay>
                                            </config>
                                        </igp-ldp-sync>
                                    </mpls>
                                    <timers>
                                        <config>
                                            <dead-interval>2</dead-interval>
                                            <hello-interval>1</hello-interval>
                                            <retransmission-interval>1</
retransmission-interval>
                                        </config>
                                    </timers>
                                </interface>
                            </interfaces>
                        </area>
                        <area>
                            <identifier>1.1.1.1</identifier>
                            <config>
                                <identifier>1.1.1.1</identifier>
                            </config>
                            <interfaces>
                                <interface>
                                    <id>eth2</id>
                                    <config>
                                        <id>eth2</id>
                                    </config>
                                    <interface-ref>
                                        <config>
                                            <interface>eth2</interface>
                                        </config>
                                    </interface-ref>
                                </interface>
                            </interfaces>
                            <virtual-links>
                                <virtual-link>
                                    <remote-router-id>10.143.74.1</remote-
router-id>
                                    <config>
                                        <remote-router-id>10.143.74.1</remote-
router-id>
                                    </config>
                                </virtual-link>
                            </virtual-links>
                        </area>
                    </areas>
```

```
                </ospfv2>
            </protocol>
        </protocols>
    </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to create OSPF process.

```
ospf area-interface-config-mode
router ospf 100
 ospf router-id 1.1.1.1
 max-metric router-lsa include-stub
 compatible rfc1583
 log-adjacency-changes detail
 no capability restart graceful
 timers spf exp 400 4000
 timers throttle lsa all 100 100 100
 area 0.0.0.0 interface eth1
 area 0.0.0.0 interface eth1 passive
 area 0.0.0.0 interface eth1 cost 65535
 area 0.0.0.0 interface eth1 network-type point-to-point
 area 0.0.0.0 interface eth1 priority 255
 area 0.0.0.0 interface eth1 authentication message-digest
 area 0.0.0.0 interface eth1 bfd
 area 0.0.0.0 interface eth1 database-filter all out
 area 0.0.0.0 interface eth1 te-metric 1
 area 0.0.0.0 interface eth1 mpls ldp-igp sync ospf holddown-timer 1
 area 0.0.0.0 interface eth1 dead-interval 2
 area 0.0.0.0 interface eth1 hello-interval 1
 area 0.0.0.0 interface eth1 retransmit-interval 1
 area 1.1.1.1 interface eth2
 area 1.1.1.1 virtual-link 10.143.74.1
 no capability traffic-engineering
 no capability cspf
!
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to create OSPF process.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>eth1</name>
        <config>
            <name>eth1</name>
        </config>
        <ipv4 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-ip">
            <config>
                <primary-ip-addr>10.10.10.1/24</primary-ip-addr>
            </config>
        </ipv4>
    </interface>
    <interface>
        <name>eth2</name>
```

```
        <config>
            <name>eth2</name>
        </config>
        <ipv4 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-ip">
            <config>
                <primary-ip-addr>20.20.20.1/24</primary-ip-addr>
            </config>
        </ipv4>
    </interface>
</interfaces>
<network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">
    <network-instance>
        <instance-name>default</instance-name>
        <config>
            <instance-name>default</instance-name>
            <instance-type>vrf</instance-type>
        </config>
        <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
            <config>
                <vrf-name>default</vrf-name>
            </config>
        </vrf>
        <bridge xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bridge">
            <config>
                <protocol>ieee-vlan-bridge</protocol>
            </config>
        </bridge>
    </network-instance>
</network-instances>
<ospfv2 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-ospf">
    <processes>
        <process>
            <ospf-id>100</ospf-id>
            <config>
                <router-id>1.1.1.1</router-id>
                <ospf-id>100</ospf-id>
                <vrf-name>default</vrf-name>
            </config>
            <capability>
                <config>
                    <disable-traffic-engineering />
                    <disable-graceful-restart />
                </config>
            </capability>
            <max-metric>
                <config>
                    <enable-max-router-lsa />
                    <include-stub />
                </config>
            </max-metric>
            <timers>
                <lsa>
                    <delays>
                        <delay>
                            <start-delay>100</start-delay>
                            <min-delay>100</min-delay>
```

```
                            <max-delay>100</max-delay>
                            <config>
                                <start-delay>100</start-delay>
                                <min-delay>100</min-delay>
                                <max-delay>100</max-delay>
                            </config>
                        </delay>
                    </delays>
                </lsa>
                <spf>
                    <delay>
                        <config>
                            <min-delay>400</min-delay>
                            <max-delay>4000</max-delay>
                        </config>
                    </delay>
                </spf>
            </timers>
            <areas>
                <area>
                    <area-id>0.0.0.0</area-id>
                    <config>
                        <area-id>0.0.0.0</area-id>
                    </config>
                    <interfaces>
                        <interface>
                            <name>eth1</name>
                            <config>
                                <name>eth1</name>
                                <passive/>
                                <priority>255</priority>
                                <network-type>point-to-point</network-type>
                                <authentication-type>message-digest</
authentication-type>
                                <cost>65535</cost>
                            </config>
                            <enable-bfd>
                                <config>
                                    <enabled>enable</enabled>
                                </config>
                            </enable-bfd>
                            <lsa-filter>
                                <config>
                                    <filter-out/>
                                </config>
                            </lsa-filter>
                            <mpls>
                                <config>
                                    <traffic-engineering-metric>1</traffic-
engineering-metric>
                                </config>
                                <igp-ldp-sync>
                                    <config>
                                        <ldp-igp-sync-enable/>
                                        <holddown-timer>1</holddown-timer>
                                    </config>
                                </igp-ldp-sync>
```

```
                            </mpls>
                            <timers>
                                <config>
                                    <dead-interval>2</dead-interval>
                                    <hello-interval>1</hello-interval>
                                    <retransmission-interval>1</
retransmission-interval>
                                </config>
                            </timers>
                        </interface>
                    </interfaces>
                </area>
                <area>
                    <area-id>1.1.1.1</area-id>
                    <config>
                        <area-id>1.1.1.1</area-id>
                    </config>
                    <interfaces>
                        <interface>
                            <name>eth2</name>
                            <config>
                                <name>eth2</name>
                            </config>
                        </interface>
                    </interfaces>
                    <virtual-links>
                        <virtual-link>
                            <remote-router-id>10.143.74.1</remote-router-id>
                            <config>
                                <remote-router-id>10.143.74.1</remote-router-
id>
                            </config>
                        </virtual-link>
                    </virtual-links>
                </area>
            </areas>
        </process>
    </processes>
    <global>
        <config>
            <area-interface-config-mode/>
        </config>
    </global>
</ospfv2>
```

Validation with NETCONF get

Here is a NetConf validation response that provides detailed information about creating OSPF process.

```
    <network-instances xmlns="http://openconfig.net/yang/network-instance">
      <network-instance>
        <name>default</name>
        <config>
          <name>default</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:DEFAULT_INSTANCE</type>
```

```
        </config>
        <protocols>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
            <name>DIRECTLY_CONNECTED</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
              <name>DIRECTLY_CONNECTED</name>
              <enabled>true</enabled>
            </config>
          </protocol>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:OSPF</identifier>
            <name>100</name>
            <ospfv2>
              <global>
                <config>
                  <router-id>1.1.1.1</router-id>
                  <summary-route-cost-mode>RFC1583_COMPATIBLE</summary-route-
cost-mode>
                  <log-adjacency-changes>true</log-adjacency-changes>
                </config>
                <mpls>
                  <config>
                    <traffic-engineering-extensions>false</traffic-
engineering-extensions>
                  </config>
                </mpls>
                <graceful-restart>
                  <config>
                    <enabled>false</enabled>
                  </config>
                </graceful-restart>
                <timers>
                  <lsa-generation>
                    <config>
                      <initial-delay>100</initial-delay>
                      <maximum-delay>100</maximum-delay>
                    </config>
                  </lsa-generation>
                  <spf>
                    <config>
                      <initial-delay>400</initial-delay>
                      <maximum-delay>4000</maximum-delay>
                    </config>
                  </spf>
                  <max-metric>
                    <config>
                      <set>true</set>
                      <include
                        xmlns:oc-ospf-types="http://openconfig.net/yang/ospf-
types">oc-ospf-types:MAX_METRIC_INCLUDE_STUB</include>
```

```
                    </config>
                  </max-metric>
                </timers>
              </global>
              <areas>
                <area>
                  <identifier>0.0.0.0</identifier>
                  <config>
                    <identifier>0.0.0.0</identifier>
                  </config>
                  <interfaces>
                    <interface>
                      <id>eth1</id>
                      <config>
                        <id>eth1</id>
                        <metric>65535</metric>
                        <network-type
                          xmlns:oc-ospf-types="http://openconfig.net/yang/
ospf-types">oc-ospf-types:POINT_TO_POINT_NETWORK</network-type>
                        <passive>true</passive>
                        <priority>255</priority>
                        <authentication-type>message-digest</authentication-
type>
                      </config>
                      <interface-ref>
                        <config>
                          <interface>eth1</interface>
                        </config>
                      </interface-ref>
                      <enable-bfd>
                        <config>
                          <enabled>true</enabled>
                        </config>
                      </enable-bfd>
                      <lsa-filter>
                        <config>
                          <all>true</all>
                        </config>
                      </lsa-filter>
                      <mpls>
                        <config>
                          <traffic-engineering-metric>1</traffic-engineering-
metric>
                        </config>
                        <igp-ldp-sync>
                          <config>
                            <enabled>true</enabled>
                            <post-session-up-delay>1000</post-session-up-
delay>
                          </config>
                        </igp-ldp-sync>
                      </mpls>
                      <timers>
                        <config>
                          <dead-interval>2</dead-interval>
                          <hello-interval>1</hello-interval>
                          <retransmission-interval>1</retransmission-interval>
```

```
                    </config>
                  </timers>
                </interface>
              </interfaces>
            </area>
            <area>
              <identifier>1.1.1.1</identifier>
              <config>
                <identifier>1.1.1.1</identifier>
              </config>
              <interfaces>
                <interface>
                  <id>eth2</id>
                  <config>
                    <id>eth2</id>
                  </config>
                  <interface-ref>
                    <config>
                      <interface>eth2</interface>
                    </config>
                  </interface-ref>
                </interface>
              </interfaces>
              <virtual-links>
                <virtual-link>
                  <remote-router-id>10.143.74.1</remote-router-id>
                  <config>
                    <remote-router-id>10.143.74.1</remote-router-id>
                  </config>
                </virtual-link>
              </virtual-links>
            </area>
          </areas>
        </ospfv2>
        <config>
          <identifier
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:OSPF</identifier>
          <name>100</name>
          <enabled>true</enabled>
        </config>
      </protocol>
    </protocols>
    <tables>
      <table>
        <protocol
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:OSPF</protocol>
        <address-family
          xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
        <config>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:OSPF</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV4</address-family>
```

```
              </config>
            </table>
          </tables>
        </network-instance>
        <network-instance>
          <name>management</name>
          <config>
            <name>management</name>
            <type
              xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
          </config>
          </tables>
        </network-instance>
      </network-instances>
```

Restrictions

In OpenConfig, for path `/network-instances/network-instance/protocols/protocol/ospfv2/areas/area/interfaces/interface/mpls/igp-ldp-sync/config/post-session-up-delay`, only steps of 1000 by 1000 should be configured. The values are rounded in Get operation in order to prevent broken values from being configured and presented.

Interface Configuration OpenConfig Translation

Configure Interfaces

This XML configuration snippet is used to define and configure network interfaces.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload for Interface Configuration.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
      <enabled>true</enabled>
      <mtu>1450</mtu>
      <description>Test desc for the interface</description>
      <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X88A8</tpid>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
    <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
      <config>
        <duplex-mode>FULL</duplex-mode>
        <auto-negotiate>false</auto-negotiate>
        <port-speed xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</port-speed>
      </config>
    </ethernet>
    <subinterfaces>
      <subinterface>
        <index>2</index>
        <config>
          <index>2</index>
          <description>Test subinterface double tagged</description>
          <enabled>true</enabled>
        </config>
        <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
          <addresses>
            <address>
              <ip>30.1.1.1</ip>
              <config>
                <ip>30.1.1.1</ip>
                <prefix-length>24</prefix-length>
```

```
              </config>
            </address>
            <address>
              <ip>40.10.10.10</ip>
              <config>
                <ip>40.10.10.10</ip>
                <prefix-length>24</prefix-length>
              </config>
            </address>
          </addresses>
        </ipv4>
      </subinterface>
    </subinterfaces>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI commands are used for Interface Configuration.

```
 interface xe10
 description "Test desc for the interface"
 speed 1g
 duplex full
 mtu 1450
 switchport dot1q ethertype 0x88A8
 no shutdown

interface xe10.2
 description "Test subinterface double tagged"
 ip address 30.1.1.1/24
 ip address 40.10.10.10/24 secondary
 no shutdown
 encapsulation dot1ad 10 inner-dot1q 200
```

OcNOS NetConf Payload

Here is the sample OcNOS NetConf Payload for Interface Configuration.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe10</name>
        <config>
            <name>xe10</name>
            <enabled>true</enabled>
            <mtu>1450</mtu>
            <description>Test desc for the interface</description>
        </config>
        <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
extended">
            <config>
                <dot1q-ether-type>0x88A8</dot1q-ether-type>
            </config>
        </extended>
        <ethernet xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
ethernet">
            <config>
```

```
                <duplex-mode>full</duplex-mode>
                <port-speed>1g</port-speed>
            </config>
        </ethernet>
    </interface>
    <interface>
        <name>xe10.2</name>
        <config>
            <name>xe10.2</name>
            <description>Test subinterface double tagged</description>
            <enabled>true</enabled>
        </config>
        <ipv4 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-ip">
            <secondary-addresses>
                <ip-address>40.10.10.10/24</ip-address>
                <config>
                    <ip-address>40.10.10.10/24</ip-address>
                </config>
            </secondary-addresses>
            <config>
                <primary-ip-addr>30.1.1.1/24</primary-ip-addr>
            </config>
        </ipv4>
    </interface>
</interfaces>
```

Validation with NetConf get

Here is a NetConf validation response for interface configuration, providing details about the current state of the specified interface.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe10</name>
        <config>
          <name>xe10</name>
          <mtu>1450</mtu>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <description>Test desc for the interface</description>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe10</name>
          <mtu>1450</mtu>
          <tpid xmlns="http://openconfig.net/yang/vlan-types">TPID_0X8100</
tpid>
          <description>Test desc for the interface</description>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10010</ifindex>
          <counters>
            <last-clear>0</last-clear>
```

```
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <config>
            <duplex-mode>FULL</duplex-mode>
            <auto-negotiate>false</auto-negotiate>
            <port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</port-speed>
          </config>
          <state>
            <duplex-mode>FULL</duplex-mode>
            <port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</port-speed>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.9729.abc5</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
              <config>
                <mtu>1450</mtu>
              </config>
            </ipv4>
            <config>
              <index>0</index>
            </config>
            <ipv6 xmlns="http://openconfig.net/yang/interfaces/ip">
              <config>
                <mtu>1450</mtu>
              </config>
            </ipv6>
          </subinterface>
```

```
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

The leaf mentioned below has been restricted to a maximum of 32 characters.

```
/interfaces/interface/name
```

As a general restriction, interface names must have valid OcNOS naming conventions, such as `'eth,' 'xe,' 'ce,' 'so,' 'po,' etc`. This naming convention is not configurable.

Configure Description

This XML configuration snippet is used to assign a description to a given interface.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload to configure interface description.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
      <enabled>true</enabled>
      <description>Test desc for the interface</description>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used for configuring interface descriptions.

```
 interface xe10
description "Test desc for the interface"
no shutdown
```

OcNOS NetConf Payload

Here is the sample OcNOS NetConf Payload for configuring interface descriptions.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe10</name>
        <config>
```

```
            <name>xe10</name>
            <enabled>true</enabled>
            <description>Test desc for the interface</description>
        </config>
    </interface>
</interfaces>
```

Validation with NetConf get

Here is a NetConf validation response for configuring interface descriptions, providing details about the current state of the specified interface.

```
        <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe10</name>
        <config>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <description>Test desc for the interface</description>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan-types">TPID_0X8100</
tpid>
          <description>Test desc for the interface</description>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10010</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
```

```
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_10GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.97c3.6447</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

The leaf mentioned below has been restricted to a maximum of 32 characters.

```
/interfaces/interface/name
```

Configure MTU

This XML configuration snippet is used to set the Maximum Transmission Unit (MTU) for an interface.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload to set the MTU for an interface.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
      <enabled>true</enabled>
      <mtu>1450</mtu>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to set the MTU for an interface.

```
interface xe10
mtu 1450
no shutdown
```

OcNOS NetConf Payload

Here is the sample OcNOS NetConf Payload to set the MTU for an interface.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe10</name>
        <config>
            <name>xe10</name>
            <enabled>true</enabled>
            <mtu>1450</mtu>
        </config>
    </interface>
</interfaces>
```

Validation with NetConf get

Here is a NetConf validation response for setting the MTU for an interface, providing details about the current state of the specified interface.

```
            <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe10</name>
        <config>
          <name>xe10</name>
          <mtu>1450</mtu>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe10</name>
          <mtu>1450</mtu>
          <tpid xmlns="http://openconfig.net/yang/vlan-types">TPID_0X8100</
tpid>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10010</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
```

```
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_10GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.97c3.6447</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
              <config>
                <mtu>1450</mtu>
              </config>
            </ipv4>
            <config>
              <index>0</index>
            </config>
            <ipv6 xmlns="http://openconfig.net/yang/interfaces/ip">
              <config>
                <mtu>1450</mtu>
              </config>
            </ipv6>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

The leaf mentioned below has been restricted to a maximum of 32 characters.

```
/interfaces/interface/name
```

The leaf mentioned below is used only to configure the physical interface.

```
/interfaces/interface/config/mtu
```

Configure Primary IP Address

This XML configuration snippet is used to specify that an IP address and prefix length will be used by the interface.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload to indicate that the interface will use an IP address and a prefix length.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
      <enabled>true</enabled>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
    <subinterfaces>
      <subinterface>
        <index>0</index>
        <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
          <addresses>
            <address>
              <ip>30.1.1.1</ip>
              <config>
                <ip>30.1.1.1</ip>
                <prefix-length>24</prefix-length>
              </config>
            </address>
          </addresses>
        </ipv4>
        <config>
          <index>0</index>
        </config>
      </subinterface>
    </subinterfaces>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure an IP address and prefix length for an interface.

```
 interface xe10
 ip address 30.1.1.1/24
 no shutdown
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload for assigning a primary IP address and prefix length to an interface.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe10</name>
```

```
        <config>
            <name>xe10</name>
            <enabled>true</enabled>
        </config>
        <ipv4 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-ip">
            <config>
                <primary-ip-addr>30.1.1.1/24</primary-ip-addr>
            </config>
        </ipv4>
    </interface>
</interfaces>
```

Validation with NetConf get

Here is a NetConf validation response for assigning a primary IP address and prefix length to an interface, providing details about the current state of the specified interface.

```
                <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe10</name>
        <config>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan-types">TPID_0X8100</
tpid>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10010</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
```

```
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_10GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.97c3.6447</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
              <addresses>
                <address>
                  <ip>30.1.1.1</ip>
                  <config>
                    <ip>30.1.1.1</ip>
                    <prefix-length>24</prefix-length>
                  </config>
                  <state>
                    <ip>30.1.1.1</ip>
                    <prefix-length>24</prefix-length>
                  </state>
                </address>
              </addresses>
            </ipv4>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

The leaf mentioned below has been restricted to a maximum of 32 characters.

```
/interfaces/interface/name
```

The first entry on the below list will be used as the primary address, as OpenConfig does not have this concept.

```
/interfaces/interface/subinterfaces/subinterface/ipv4/addresses/address
```

Configure Secondary IP Address

This XML configuration snippet specifies the use of a secondary IP address and prefix length for an interface. It's important to note that the secondary address cannot be configured if there is no primary IP address present.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf payload that specifies the configuration for an interface. This configuration includes the interface type, subinterface details, and IPv4 addresses with their respective prefix lengths.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
    <subinterfaces>
      <subinterface>
        <index>0</index>
        <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
          <addresses>
            <address>
              <ip>10.10.10.1</ip>
              <config>
                <ip>10.10.10.1</ip>
                <prefix-length>24</prefix-length>
              </config>
            </address>
            <address>
              <ip>11.11.11.1</ip>
              <config>
                <ip>11.11.11.1</ip>
                <prefix-length>24</prefix-length>
              </config>
            </address>
          </addresses>
        </ipv4>
        <config>
          <index>0</index>
        </config>
      </subinterface>
    </subinterfaces>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure an interface with both a primary and a secondary IP address.

```
 interface xe10
  ip address 10.10.10.1/24
  ip address 11.11.11.1/24 secondary
  no shutdown
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload for configuring interface with both a primary and a secondary IP address.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe10</name>
        <config>
            <name>xe10</name>
        </config>
        <ipv4 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-ip">
            <secondary-addresses>
                <ip-address>11.11.11.1/24</ip-address>
                <config>
                    <ip-address>11.11.11.1/24</ip-address>
                </config>
            </secondary-addresses>
            <config>
                <primary-ip-addr>10.10.10.1/24</primary-ip-addr>
            </config>
        </ipv4>
    </interface>
</interfaces>
```

Validation with NetConf get

Here is a NetConf validation response providing details about the current state of the specified interface, as configured in the OpenConfig YANG model.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe10</name>
        <config>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan-types">TPID_0X8100</
tpid>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10010</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
```

```
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_10GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.97c3.6447</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
              <addresses>
                <address>
                  <ip>10.10.10.1</ip>
                  <config>
                    <ip>10.10.10.1</ip>
                    <prefix-length>24</prefix-length>
                  </config>
                  <state>
                    <ip>10.10.10.1</ip>
                    <prefix-length>24</prefix-length>
                  </state>
                </address>
                <address>
                  <ip>11.11.11.1</ip>
                  <config>
                    <ip>11.11.11.1</ip>
                    <prefix-length>24</prefix-length>
                  </config>
                  <state>
                    <ip>11.11.11.1</ip>
                    <prefix-length>24</prefix-length>
                  </state>
                </address>
              </addresses>
            </ipv4>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
```

```
      </interface>
    </interfaces>
```

Restrictions

The leaf mentioned below has been restricted to a maximum of 32 characters.

```
/interfaces/interface/name
```

All leaves of the below list, excluding the first entry, will be treated as secondary addresses.

```
/interfaces/interface/subinterfaces/subinterface/ipv4/addresses/address
```

Configure IPv6 Addresses

This XML configuration snippet is used to set the IPv6 addresses of an interface.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload for configuring IPv6 addresses on an interface.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe11</name>
    <config>
      <name>xe11</name>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
    <subinterfaces>
      <subinterface>
        <index>0</index>
        <ipv6 xmlns="http://openconfig.net/yang/interfaces/ip">
          <addresses>
            <address>
              <ip>ad0f::ac0f:ab0f</ip>
              <config>
                <ip>ad0f::ac0f:ab0f</ip>
                <prefix-length>64</prefix-length>
              </config>
            </address>
            <address>
              <ip>ae0f::ad0f:ac0f</ip>
              <config>
                <ip>ae0f::ad0f:ac0f</ip>
                <prefix-length>64</prefix-length>
              </config>
            </address>
            <address>
              <ip>f0ca:bebe::cafe</ip>
              <config>
```

```
                <ip>f0ca:bebe::cafe</ip>
                <prefix-length>64</prefix-length>
              </config>
            </address>
          </addresses>
        </ipv6>
        <config>
          <index>0</index>
        </config>
      </subinterface>
    </subinterfaces>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure an interface with multiple IPv6 addresses and enable the interface.

```
interface xe11
 ipv6 address ad0f::ac0f:ab0f/64
 ipv6 address ae0f::ad0f:ac0f/64
 ipv6 address f0ca:bebe::cafe/64
 no shutdown
 !
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload for configuring an interface with multiple IPv6 addresses.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe11</name>
        <config>
            <name>xe11</name>
        </config>
        <ipv6 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-ip">
            <addresses>
                <ipv6-address>ad0f::ac0f:ab0f/64</ipv6-address>
                <config>
                    <ipv6-address>ad0f::ac0f:ab0f/64</ipv6-address>
                </config>
            </addresses>
            <addresses>
                <ipv6-address>ae0f::ad0f:ac0f/64</ipv6-address>
                <config>
                    <ipv6-address>ae0f::ad0f:ac0f/64</ipv6-address>
                </config>
            </addresses>
            <addresses>
                <ipv6-address>f0ca:bebe::cafe/64</ipv6-address>
                <config>
                    <ipv6-address>f0ca:bebe::cafe/64</ipv6-address>
                </config>
            </addresses>
        </ipv6>
    </interface>
```

```
</interfaces>
```

Validation with NetConf get

The below NetConf validation response provides details about the current state of the specified interface configured with multiple IPv6 addresses using OpenConfig YANG data model elements.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe10</name>
        <config>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan-types">TPID_0X8100</
tpid>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10010</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <config>
            <duplex-mode>FULL</duplex-mode>
          </config>
          <state>
            <duplex-mode>FULL</duplex-mode>
            <negotiated-port-speed
```

```
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_10GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.97c3.6447</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

The leaf mentioned below has been restricted to a maximum of 32 characters.

```
/interfaces/interface/name
```

Configure Duplex-mode

This XML configuration snippet is used to configure the duplex mode for an interface.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload to configure interface with the FULL duplex mode enabled.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
      <enabled>true</enabled>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
    <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
      <config>
        <duplex-mode>FULL</duplex-mode>
      </config>
    </ethernet>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure an interface with full duplex mode enabled and with no shutdown.

```
interface xe10
duplex full
no shutdown
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure interface with full duplex mode enabled and ensures that the interface is in the `enabled` state.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe10</name>
        <config>
            <name>xe10</name>
            <enabled>true</enabled>
        </config>
        <ethernet xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
ethernet">
            <config>
                <duplex-mode>full</duplex-mode>
            </config>
        </ethernet>
    </interface>
</interfaces>
```

Validation with NetConf get

Here is a NetConf validation response provides comprehensive information about the current state of an interface, including its operational and administrative status, traffic counters, and Ethernet configuration details.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe10</name>
        <config>
          <name>xe10</name>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe10</name>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10010</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
```

```
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <config>
            <auto-negotiate>false</auto-negotiate>
            <port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</port-speed>
          </config>
          <state>
            <port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</port-speed>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.9729.abc5</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

The leaf mentioned below has been restricted to a maximum of 32 characters.

```
/interfaces/interface/name
```

Default

By default, the duplex mode for an interface is set to `full duplex`.

Configure Port-Speed

This XML configuration snippet is used to set the link speed of the interface.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload that specifies the configuration for an interface. It sets the interface's state to enabled (`true`) and defines it as an Ethernet interface (`ianaift:ethernetCsmacd`). Additionally, it specifies that auto-negotiation for link speed is disabled (`false`) and sets the port speed for a specified Ethernet interface.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
      <enabled>true</enabled>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
    <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
      <config>
        <auto-negotiate>false</auto-negotiate>
        <port-speed xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</port-speed>
      </config>
    </ethernet>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure an interface for a speed of 1 gigabit and enable it.

```
interface xe10
speed 1g
no shutdown
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload that enables an interface and sets its speed.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe10</name>
        <config>
            <name>xe10</name>
            <enabled>true</enabled>
        </config>
        <ethernet xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
ethernet">
```

```
            <config>
                <port-speed>1g</port-speed>
            </config>
        </ethernet>
    </interface>
</interfaces>
```

Validation with NetConf get

Here is a NetConf validation response to set the speed of an interface, providing details about the current state of the specified interface.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe10</name>
        <config>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan-types">TPID_0X8100</
tpid>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10010</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
```

```
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_10GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.9729.abc5</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

The leaf mentioned below has been restricted to a maximum of 32 characters.

```
/interfaces/interface/name
```

This leaf can only be used when the auto-negotiate leaf (`../auto-negotiate`) is set to false.

```
/interfaces/interface/ethernet/config/port-speed
```

Configure Ethernet Type

This XML configuration snippet is used to specify the Ethernet type for an interface.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload that sets the Ethernet Type for an interface.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
      <enabled>true</enabled>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
    <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-types="http://
openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X88A8</tpid>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command configures VLAN tagging with Ethernet Type on an interface and ensures that the interface is not in shutdown mode.

```
interface xe10
switchport dot1q ethertype 0x88a8
no shutdown
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload that enables an interface and configures it to use a `dot1q` Ethernet Type for VLAN tagging.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe10</name>
        <config>
            <name>xe10</name>
            <enabled>true</enabled>
        </config>
        <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
extended">
            <config>
                <dot1q-ether-type>0x88a8</dot1q-ether-type>
            </config>
        </extended>
    </interface>
</interfaces>
```

Validation with NetConf get

Here is a NetConf validation response for the specified interface, providing comprehensive details about its current state, including operational and administrative statuses, traffic counters, Ethernet configuration, and VLAN tagging settings.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe10</name>
        <config>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe10</name>
          <tpid xmlns="http://openconfig.net/yang/vlan-types">TPID_0X88a8</
tpid>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10010</ifindex>
          <counters>
```

```
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_10GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.9729.abc5</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

The leaf mentioned below has been restricted to a maximum of 32 characters.

```
/interfaces/interface/name
```

Configure Sub-interface with Primary and Secondary Addresses

This XML configuration snippet sets both primary and secondary IP addresses, each with its corresponding prefix length, for use by a sub-interface.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload for configuring sub-interface with two IPv4 addresses, each having the specified prefix length. This payload specifies the IP addresses to be used by the sub-interface with the specified index.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
    </config>
    <subinterfaces>
      <subinterface>
        <index>10</index>
        <config>
          <index>10</index>
        </config>
        <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
          <addresses>
            <address>
              <ip>20.21.22.23</ip>
              <config>
                <ip>20.21.22.23</ip>
                <prefix-length>24</prefix-length>
              </config>
            </address>
            <address>
              <ip>24.25.26.27</ip>
              <config>
                <ip>24.25.26.27</ip>
                <prefix-length>24</prefix-length>
              </config>
            </address>
          </addresses>
        </ipv4>
      </subinterface>
    </subinterfaces>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure a sub-interface with both a primary and a secondary IPv4 address.

```
 interface xe10.10
 ip address 20.21.22.23/24
 ip address 24.25.26.27/24 secondary
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload for configuring a sub-interface with both a primary and a secondary IPv4 address.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe10.10</name>
        <config>
            <name>xe10.10</name>
        </config>
        <ipv4 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-ip">
            <secondary-addresses>
                <ip-address>24.25.26.27/24</ip-address>
                <config>
                    <ip-address>24.25.26.27/24</ip-address>
                </config>
            </secondary-addresses>
            <config>
                <primary-ip-addr>20.21.22.23/24</primary-ip-addr>
            </config>
        </ipv4>
    </interface>
</interfaces>
```

Validation with NetConf get

Here is a NetConf validation response for configuring a sub-interface with two IPv4 addresses, each with a specified prefix length. The response provides information about the current state of the specified sub-interface, including its operational status, interface index, and traffic counters.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
    </config>
    <subinterfaces>
      <subinterface>
        <index>10</index>
        <config>
          <index>10</index>
        </config>
        <state>
          <name>xe10.10</name>
          <logical>true</logical>
          <oper-status>DOWN</oper-status>
          <ifindex>20500490</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
        </state>
```

```
            <ipv4 xmlns="http://openconfig.net/yang/interfaces/ip">
              <addresses>
                <address>
                  <ip>20.21.22.23</ip>
                  <config>
                    <ip>20.21.22.23</ip>
                    <prefix-length>24</prefix-length>
                  </config>
                  <state>
                    <ip>20.21.22.23</ip>
                    <prefix-length>24</prefix-length>
                  </state>
                </address>
                <address>
                  <ip>24.25.26.27</ip>
                  <config>
                    <ip>24.25.26.27</ip>
                    <prefix-length>24</prefix-length>
                  </config>This configuration was introduced
                  <state>
                    <ip>24.25.26.27</ip>
                    <prefix-length>24</prefix-length>
                  </state>
                </address>
              </addresses>
            </ipv4>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

The leaf mentioned below has been restricted to a maximum of 32 characters.

```
/interfaces/interface/name
```

The first entry on the below list will be used as the primary address, as OpenConfig does not have this concept.

```
/interfaces/interface/subinterfaces/subinterface/ipv4/addresses/address
```

When using OpenConfig translation, use the sub-interface name in the format `<ifname>.<id>`, as OpenConfig does not support the `<ifname>.<id>.<id>` format, even though it is allowed by OcNOS CLI.

```
/interfaces/interface/subinterfaces/subinterface/index
```

LACP OpenConfig Translation

Create Static LAG Interface

This XML configuration snippet is used to create a static Link Aggregation Group (LAG) interface with a specified name and configure its settings for a network device.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload that configures two Ethernet interfaces to be part of a LAG. The LAG uses the Link Aggregation Control Protocol (LACP) in ACTIVE mode, and it requires a minimum of two member links to be up for the LAG to be operational. Additionally, set the system priority.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
    <interface>
      <name>sa10</name>
      <config>
        <name>sa10</name>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
      </config>
      <aggregation xmlns="http://openconfig.net/yang/interfaces/aggregate">
        <config>
          <min-links>2</min-links>
          <lag-type>STATIC</lag-type>
        </config>
      </aggregation>
    </interface>
    <interface>
      <name>xe6</name>
      <config>
        <name>xe6</name>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
      </config>
      <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
        <config>
          <aggregate-id xmlns="http://openconfig.net/yang/interfaces/
aggregate">sa10</aggregate-id>
          <lacp-mode xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-if-
deviations">ACTIVE</lacp-mode>
        </config>
      </ethernet>
    </interface>
    <interface>
      <name>xe7</name>
```

```
      <config>
        <name>xe7</name>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
      </config>
      <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
        <config>
          <aggregate-id xmlns="http://openconfig.net/yang/interfaces/
aggregate">sa10</aggregate-id>
          <lacp-mode xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-if-
deviations">ACTIVE</lacp-mode>
        </config>
      </ethernet>
    </interface>
  </interfaces>
  <lacp xmlns="http://openconfig.net/yang/lacp">
    <config>
        <system-priority>2</system-priority>
    </config>
  </lacp>
```

OcNOS CLI Command

The below CLI commands are used to configure a static LAG interface with a system priority and a minimum required member link count. Ethernet interfaces are also assigned to the static LAG group with the specified identifier.

```
 lacp system-priority 2
!
interface sa10
 port-channel min-links 2
!
interface xe6
 static-channel-group 10
!
interface xe7
 static-channel-group 10
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload that configures two Ethernet interfaces to be part of a static LAG with the specified identifier. The LAG requires a minimum of two member links to be operational and uses the LACP mode `ACTIVE`. Additionally, it sets the system priority for LACP.

This payload includes configurations for both OpenConfig and OcNOS YANG models to ensure compatibility between the two.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
    <interface>
        <name>sa10</name>
        <config>
            <name>sa10</name>
            <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
        </config>
        <aggregation xmlns="http://openconfig.net/yang/interfaces/aggregate">
            <config>
```

```
                <min-links>2</min-links>
                <lag-type>STATIC</lag-type>
            </config>
        </aggregation>
    </interface>
    <interface>
        <name>xe6</name>
        <config>
            <name>xe6</name>
            <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
            <config>
                <aggregate-id xmlns="http://openconfig.net/yang/interfaces/
aggregate">sa10</aggregate-id>
                <lacp-mode xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-
if-deviations">ACTIVE</lacp-mode>
            </config>
        </ethernet>
    </interface>
    <interface>
        <name>xe7</name>
        <config>
            <name>xe7</name>
            <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
            <config>
                <aggregate-id xmlns="http://openconfig.net/yang/interfaces/
aggregate">sa10</aggregate-id>
                <lacp-mode xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-
if-deviations">ACTIVE</lacp-mode>
            </config>
        </ethernet>
    </interface>
</interfaces>
<lacp xmlns="http://openconfig.net/yang/lacp">
    <config>
        <system-priority>2</system-priority>
    </config>
</lacp>
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>sa10</name>
        <config>
            <name>sa10</name>
        </config>
        <aggregator xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
aggregate">
            <config>
                <min-links>2</min-links>
            </config>
        </aggregator>
    </interface>
    <interface>
        <name>xe6</name>
```

```
        <config>
            <name>xe6</name>
        </config>
        <ethernet xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
ethernet">
            <config />
        </ethernet>
        <member-aggregation xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
if-aggregate">
            <config>
                <agg-type>static</agg-type>
                <aggregate-id>10</aggregate-id>
                <lacp-mode>active</lacp-mode>
            </config>
        </member-aggregation>
    </interface>
    <interface>
        <name>xe7</name>
        <config>
            <name>xe7</name>
        </config>
        <ethernet xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
ethernet">
            <config />
        </ethernet>
        <member-aggregation xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
if-aggregate">
            <config>
                <agg-type>static</agg-type>
                <aggregate-id>10</aggregate-id>
                <lacp-mode>active</lacp-mode>
            </config>
        </member-aggregation>
    </interface>
</interfaces>
<lacp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lacp">
    <global>
        <config>
            <system-priority>2</system-priority>
        </config>
    </global>
</lacp>
```

Validation with NetConf get

Here is a NetConf validation response defines three interfaces, including a `static LAG` type that requires a minimum of two member links and has an operational status of `UP`. Both of the Ethernet interfaces are part of this LAG, and they also have `UP` operational status. The LAG uses LACP in `ACTIVE` mode, and it sets the system priority for LACP.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>sa10</name>
        <config>
          <name>sa10</name>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
```

```
        </config>
        <state>
          <name>sa10</name>
          <logical>false</logical>
          <last-change>35600</last-change>
          <oper-status>UP</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>200010</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>7</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>7</out-pkts>
            <out-octets>774</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>7</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>3852605</in-pkts>
            <in-octets>130989214</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_UNKNOWN</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.9729.abf2</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
        <aggregation xmlns="http://openconfig.net/yang/interfaces/aggregate">
          <config>
            <min-links>2</min-links>
            <lag-type>STATIC</lag-type>
          </config>
          <state>
            <min-links>2</min-links>
            <lag-type>STATIC</lag-type>
          </state>
        </aggregation>
```

```
      </interface>
    </interfaces>
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe6</name>
        <config>
          <name>xe6</name>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe6</name>
          <logical>false</logical>
          <last-change>35600</last-change>
          <oper-status>UP</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10006</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>7</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>7</in-pkts>
            <in-octets>814</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_10GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.9729.abc1</hw-mac-address>
            <aggregate-id xmlns="http://openconfig.net/yang/interfaces/
aggregate">sa10</aggregate-id>
          </state>
          <config>
            <aggregate-id xmlns="http://openconfig.net/yang/interfaces/
aggregate">sa10</aggregate-id>
            <lacp-mode xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-if-
deviations">ACTIVE</lacp-mode>
          </config>
        </ethernet>
        <subinterfaces>
```

```
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe7</name>
        <config>
          <name>xe7</name>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe7</name>
          <logical>false</logical>
          <last-change>15300</last-change>
          <oper-status>UP</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>10007</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>7</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>7</out-pkts>
            <out-octets>774</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>4193454</in-pkts>
            <in-octets>142577504</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b86a.9729.abc2</hw-mac-address>
            <aggregate-id xmlns="http://openconfig.net/yang/interfaces/
aggregate">sa10</aggregate-id>
          </state>
```

```
          <config>
            <aggregate-id xmlns="http://openconfig.net/yang/interfaces/
aggregate">sa10</aggregate-id>
          <lacp-mode xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-if-
deviations">ACTIVE</lacp-mode>
          </config>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
    <lacp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lacp">
      <global>
        <config>
          <system-priority>2</system-priority>
        </config>
        <state>
          <system-priority>2</system-priority>
          <system-id>b8-6a-97-82-11-ba</system-id>
        </state>
      </global>
    </lacp>
```

Restrictions

The interface name for a static LAG interface should begin with the text `sa,` followed by a number, such as `sa3`.

```
/interfaces/interface/name
```

The data type of the below leaf has been modified to `uint8`.

```
/interfaces/interface/aggregation/config/min-links
```

The below leaf was not in a supported state.

```
/lacp/interfaces/interface/config/lacp-mode
```

Create Dynamic LAG Interface

This XML configuration snippet is used to create a dynamic Link Aggregation Group (LAG) interface with a specified name and configure its settings for a network device.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload that configures an Ethernet interfaces to be a part of a LAG with a specified identifier. The LAG uses the LACP in `ACTIVE` mode, and it requires a minimum of two member links to be operational. Additionally, it sets the system priority for LACP.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
    <interface>
        <name>xe10</name>
        <config>
            <name>xe10</name>
            <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">/oc-
if:interfaces/oc-if:interface/oc-if:config/oc-if:name
            <config>
                <lacp-mode xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-
if-deviations">ACTIVE</lacp-mode>
                <aggregate-id xmlns="http://openconfig.net/yang/interfaces/
aggregate">po2</aggregate-id>
            </config>
        </ethernet>
    </interface>
    <interface>
        <name>po2</name>
        <config>
            <name>po2</name>
            <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
        </config>
        <aggregation xmlns="http://openconfig.net/yang/interfaces/aggregate">
            <config>
                <min-links>2</min-links>
                <lag-type>LACP</lag-type>
            </config>
        </aggregation>
    </interface>
</interfaces>
<lacp xmlns="http://openconfig.net/yang/lacp">
    <config>
        <system-priority>2</system-priority>
    </config>
    <interfaces>
        <interface>
            <name>xe10</name>
        </interface>
    </interfaces>
</lacp>
```

OcNOS CLI Command

The below CLI commands are used to configure a dynamic LAG interface with a system priority and a minimum required member link count. Ethernet interface is also assigned to the dynamic LAG group with the specified identifier and sets the LACP mode as `ACTIVE`.

```
lacp system-priority 2
```

```
!
interface po2
 port-channel min-links 2
!
interface xe10
 channel-group 2 mode active
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload that configures a dynamic LAG interface with a minimum required member link count and assigns an Ethernet interface to the LAG group with LACP mode `ACTIVE`. Additionally, it sets the system priority for LACP.

```
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
        <name>xe10</name>
        <config>
            <name>xe10</name>
        </config>
        <member-aggregation xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
if-aggregate">
            <config>
                <lacp-mode>active</lacp-mode>
                <aggregate-id>2</aggregate-id>
                <agg-type>lacp</agg-type>
            </config>
        </member-aggregation>
    </interface>
    <interface>
        <name>po2</name>
        <config>
            <name>po2</name>
        </config>
        <aggregator xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
aggregate">
            <config>
                <min-links>2</min-links>
            </config>
        </aggregator>
    </interface>
</interfaces>
<lacp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lacp">
    <global>
        <config>
            <system-priority>2</system-priority>
        </config>
    </global>
</lacp>
```

Validation with NetConf get

Here is a NetConf validation response provides detailed information about the dynamic LAG interface status and configuration, which includes dynamic link aggregation using LACP, minimum member link requirements, operational status, and system priority settings.

```
    <rpc-reply xmlns="urn:ietf:params:xml:ns:NETCONF:base:1.0">
  <data>
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>po2</name>
        <config>
          <name>po2</name>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
        </config>
        <state>
          <name>po2</name>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>100002</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>37</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>37</out-pkts>
            <out-octets>4736</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_UNKNOWN</negotiated-port-speed>
            <negotiated-duplex-mode>HALF</negotiated-duplex-mode>
            <hw-mac-address>b86a.9729.abf2</hw-mac-address>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
```

```
          <aggregation xmlns="http://openconfig.net/yang/interfaces/aggregate">
            <config>
              <min-links>2</min-links>
              <lag-type>LACP</lag-type>
            </config>
            <state>
              <min-links>2</min-links>
              <lag-type>LACP</lag-type>
            </state>
          </aggregation>
        </interface>
      </interfaces>
    </data>
  </rpc-reply>
```

Restrictions

The interface name for a dynamic LAG interface should begin with the text `po`, followed by a number, such as `po2`.

```
/interfaces/interface/name
```

The data type of the below leaf has been modified to `uint8`.

```
/interfaces/interface/aggregation/config/min-links
```

The below leaf was not in a supported state.

```
/lacp/interfaces/interface/config/lacp-mode
```

Tunnel Interfaces OpenConfig Translation

Create Tunnel Interface

This XML configuration snippet is used to specify the configuration for an OpenConfig interface with a tunnel type, source and destination IP addresses.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is the sample OpenConfig NetConf Payload configures an OpenConfig interface as a tunnel type with specific source and destination IP addresses and Time to Live (TTL) settings.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>Tunnel30</name>
    <config>
      <name>Tunnel30</name>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:tunnel</type>
    </config>
    <tunnel xmlns="http://openconfig.net/yang/interfaces/tunnel">
      <ipv4>
        <addresses>
          <address>
            <ip>40.1.1.1</ip>
            <config>
              <ip>40.1.1.1</ip>
              <prefix-length>24</prefix-length>
            </config>
          </address>
        </addresses>
      </ipv4>
      <config>
        <src>20.2.2.1</src>
        <dst>20.2.2.2</dst>
        <ttl>250</ttl>
      </config>
    </tunnel>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure an interface with an IP address, a tunnel source and destination addresses, and a tunnel TTL value.

```
 interface Tunnel30
ip address 40.1.1.1/24
tunnel source 20.2.2.1
tunnel destination 20.2.2.2
tunnel ttl 250
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload that configures a Tunnel Interface with the specified source and destination addresses, and a TTL value. It also includes a secondary IPv4 address for the interface.

```
      <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
        <interface>
          <name>Tunnel30</name>
          <config>
            <name>Tunnel30</name>
          </config>
          <tunnel xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
extended">
            <config>
              <src>20.2.2.1</src>
              <dst>20.2.2.2</dst>
              <ttl>250</ttl>
            </config>
          </tunnel>
          <ipv4 xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-ip">
            <secondary-addresses>
              <ip-address>40.1.1.1/24</ip-address>
              <config>
                <ip-address>40.1.1.1/24</ip-address>
              </config>
            </secondary-addresses>
          </ipv4>
        </interface>
      </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response provides an information about the configuration and status of the Tunnel Interface.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>Tunnel30</name>
        <config>
          <name>Tunnel30</name>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:tunnel</type>
        </config>
        <state>
          <name>Tunnel30</name>
          <logical>false</logical>
          <last-change>0</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>0</ifindex>
```

```
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:tunnel</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_UNKNOWN</negotiated-port-speed>
            <negotiated-duplex-mode>HALF</negotiated-duplex-mode>
            <hw-mac-address>0000.0000.0000</hw-mac-address>
          </state>
        </ethernet>
        <tunnel xmlns="http://openconfig.net/yang/interfaces/tunnel">
          <ipv4>
            <addresses>
              <address>
                <ip>40.1.1.1</ip>
                <config>
                  <ip>40.1.1.1</ip>
                  <prefix-length>24</prefix-length>
                </config>
                <state>
                  <ip>40.1.1.1</ip>
                  <prefix-length>24</prefix-length>
                </state>
              </address>
            </addresses>
          </ipv4>
          <config>
            <src>20.2.2.1</src>
            <dst>20.2.2.2</dst>
            <ttl>250</ttl>
          </config>
          <state>
            <src>20.2.2.1</src>
            <dst>20.2.2.2</dst>
            <ttl>250</ttl>
          </state>
        </tunnel>
      </interface>
    </interfaces>
```

Restrictions

Tunnel interfaces must begin with `Tunnel` followed by a numerical value, such as `Tunnel30`.

```
/interfaces/interface/name
```

The tunnel configuration parameters `src` and `dst` do not have support for IPv6.

```
/interfaces/interface/tunnel/config/dst
/interfaces/interface/tunnel/config/src
```

The data type of the `ttl` leaf has been updated from `uint8` to `uint16`.

```
/interfaces/interface/tunnel/config/ttl
```

The primary IP address is determined by the first configured address, and it is not possible to delete the primary address without removing the other addresses.

```
/interfaces/interface/tunnel/ipv4/addresses/address/config/ip
```

Static Route OpenConfig Translation

Create a Static Route

This XML configuration snippet is used to specify the destination prefix and mask for the network and create a gateway statically.

Release

This configuration was introduced in OcNOS version 4.2.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to specify the destination prefix and mask for the network and create a gateway statically.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
        <name>TEST_A9</name>
        <config>
            <name>TEST_A9</name>
            <type xmlns:oc-ni-types="http://openconfig.net/yang/network-
instance-types">oc-ni-types:L3VRF</type>
        </config>
        <protocols>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                <name>DIRECTLY_CONNECTED</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                    <name>DIRECTLY_CONNECTED</name>
                    <enabled>true</enabled>
                </config>
            </protocol>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</identifier>
                <name>static-routes</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:STATIC</identifier>
                    <name>static-routes</name>
                </config>
                <static-routes>
                    <static>
                        <prefix>192.168.0.0/24</prefix>
                        <next-hops>
                            <next-hop>
```

```
                                <index>172.17.30.2</index>
                                <interface-ref>
                                    <config>
                                        <interface>xe2</interface>
                                    </config>
                                </interface-ref>
                                <config>
                                    <metric>10</metric>
                                    <index>172.17.30.2</index>
                                    <next-hop>172.17.30.2</next-hop>
                                </config>
                            </next-hop>
                        </next-hops>
                        <config>
                            <prefix>192.168.0.0/24</prefix>
                        </config>
                    </static>
                </static-routes>
            </protocol>
        </protocols>
        <tables>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV6</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV6</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
        </tables>
        <interfaces>
```

```
            <interface>
                <id>xe2</id>
                <config>
                    <interface>xe2</interface>
                    <id>xe2</id>
                </config>
            </interface>
        </interfaces>
    </network-instance>
</network-instances>
```

OcNOS CLI Command

This CLI command is used to specify the destination prefix and mask for the network and create a gateway statically.

```
interface xe2
 ip vrf forwarding TEST_A9
!
ip route vrf TEST_A9 192.168.0.0/24 172.17.30.2 xe2 10
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to specify the destination prefix and mask for the network and create a gateway statically.

```
<network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">
  <network-instance>
    <instance-name>TEST_A9</instance-name>
    <instance-type>vrf</instance-type>
    <config>
      <instance-name>TEST_A9</instance-name>
      <instance-type>vrf</instance-type>
    </config>
    <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
      <config>
        <vrf-name>TEST_A9</vrf-name>
      </config>
    </vrf>
    <static-routing xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-rib">
      <ipv4>
        <static-route>
          <prefix>192.168.0.0/24</prefix>
          <config>
            <prefix>192.168.0.0/24</prefix>
          </config>
          <next-hops-gateway>
            <next-hop-gateway>
              <gateway>172.17.30.2</gateway>
              <config>
                <gateway>172.17.30.2</gateway>
                <interface>xe2</interface>
                <distance>10</distance>
              </config>
            </next-hop-gateway>
          </next-hops-gateway>
```

```
        </static-route>
      </ipv4>
    </static-routing>
  </network-instance>
</network-instances>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about destination prefix and mask for the network and create a gateway statically.

```
        <network-instances xmlns="http://openconfig.net/yang/network-
instance">
      <network-instance>
        <name>TEST_A9</name>
        <config>
          <name>TEST_A9</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
        </config>
        <state>
          <name>TEST_A9</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
        </state>
        <protocols>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
            <name>DIRECTLY_CONNECTED</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
              <name>DIRECTLY_CONNECTED</name>
              <enabled>true</enabled>
            </config>
          </protocol>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:STATIC</identifier>
            <name>static-routes</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:STATIC</identifier>
              <name>static-routes</name>
            </config>
            <static-routes>
              <static>
                <prefix>192.168.0.0/24</prefix>
                <next-hops>
                  <next-hop>
                    <index>172.17.30.2</index>
```

```
                    <interface-ref>
                      <config>
                        <interface>xe2</interface>
                      </config>
                      <state>
                        <interface>xe2</interface>
                      </state>
                    </interface-ref>
                    <config>
                      <metric>10</metric>
                      <index>172.17.30.2</index>
                      <next-hop>172.17.30.2</next-hop>
                    </config>
                    <state>
                      <metric>10</metric>
                      <index>172.17.30.2</index>
                      <next-hop>172.17.30.2</next-hop>
                    </state>
                  </next-hop>
                </next-hops>
                <config>
                  <prefix>192.168.0.0/24</prefix>
                </config>
                <state>
                  <prefix>192.168.0.0/24</prefix>
                </state>
              </static>
            </static-routes>
          </protocol>
        </protocols>
        <tables>
          <table>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
            <config>
              <protocol
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
              <address-family
                xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV4</address-family>
            </config>
          </table>
          <table>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
            <config>
              <protocol
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
```

```
              <address-family
                xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV6</address-family>
            </config>
          </table>
          <table>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:STATIC</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
            <config>
              <protocol
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:STATIC</protocol>
              <address-family
                xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV4</address-family>
            </config>
          </table>
        </tables>
        <interfaces>
          <interface>
            <id>lo.TEST_A9</id>
            <config>
              <interface>lo.TEST_A9</interface>
              <id>lo.TEST_A9</id>
            </config>
          </interface>
          <interface>
            <id>xe2</id>
            <config>
              <interface>xe2</interface>
              <id>xe2</id>
            </config>
          </interface>
        </interfaces>
      </network-instance>
    </network-instances>
```

Restrictions

`/network-instances/network-instance/protocols/protocol/static-routes/static/next-hops/next-hop`

It is necessary to have at least one entry in this list of next hops.

`/network-instances/network-instance/protocols/protocol/static-routes/static/next-hops/next-hop/index`

Whenever `config/next-hop` leaf is configured, the index must have the same value as the next-hop. If not, the index must match the interface name built from `interface-ref/config/interface` and `interface-ref/config/subinterface`. For example `xe1`, `xe2.100` and so on.

Create a Static Route with Load Balancing

This XML configuration snippet is used to create two paths to a specified destination prefix and mask for the network and a gateway working in load balancing scenario. With these two links, it is possible to guarantee the service availability. All traffic should be routed throughout both links at the same time and if any of them has a failure, all traffic must be routed through the available link.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create a static route with load balancing.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
        <name>TEST_A9</name>
        <config>
            <name>TEST_A9</name>
            <type xmlns:oc-ni-types="http://openconfig.net/yang/network-
instance-types">oc-ni-types:L3VRF</type>
        </config>
        <protocols>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                <name>DIRECTLY_CONNECTED</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                    <name>DIRECTLY_CONNECTED</name>
                    <enabled>true</enabled>
                </config>
            </protocol>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</identifier>
                <name>static-routes</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:STATIC</identifier>
                    <name>static-routes</name>
                </config>
                <static-routes>
                    <static>
                        <prefix>192.168.0.0/24</prefix>
                        <next-hops>
                            <next-hop>
                                <index>172.17.30.2</index>
                                <interface-ref>
                                    <config>
                                        <interface>xe2</interface>
                                    </config>
```

```
                                </interface-ref>
                                <config>
                                    <metric>10</metric>
                                    <index>172.17.30.2</index>
                                    <next-hop>172.17.30.2</next-hop>
                                </config>
                            </next-hop>
                            <next-hop>
                                <index>172.17.31.2</index>
                                <interface-ref>
                                    <config>
                                        <interface>xe1</interface>
                                    </config>
                                </interface-ref>
                                <config>
                                    <metric>10</metric>
                                    <index>172.17.31.2</index>
                                    <next-hop>172.17.31.2</next-hop>
                                </config>
                            </next-hop>
                        </next-hops>
                        <config>
                            <prefix>192.168.0.0/24</prefix>
                        </config>
                    </static>
                </static-routes>
            </protocol>
        </protocols>
        <tables>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV6</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV6</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
```

```
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
        </tables>
        <interfaces>
            <interface>
                <id>xe1</id>
                <config>
                    <interface>xe1</interface>
                    <id>xe1</id>
                </config>
            </interface>
            <interface>
                <id>xe2</id>
                <config>
                    <interface>xe2</interface>
                    <id>xe2</id>
                </config>
            </interface>
        </interfaces>
    </network-instance>
</network-instances>
```

OcNOS CLI Command

This CLI command is used to create a static route with load balancing.

```
interface xe1
 ip vrf forwarding TEST_A9
!
interface xe2
 ip vrf forwarding TEST_A9
!
ip route vrf TEST_A9 192.168.0.0/24 172.17.30.2 xe2 10
ip route vrf TEST_A9 192.168.0.0/24 172.17.31.2 xe1 10
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create a static route with load balancing.

```
<network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">
  <network-instance>
    <instance-name>TEST_A9</instance-name>
    <instance-type>vrf</instance-type>
    <config>
      <instance-name>TEST_A9</instance-name>
      <instance-type>vrf</instance-type>
    </config>
    <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
      <config>
        <vrf-name>TEST_A9</vrf-name>
      </config>
```

```
    </vrf>
    <static-routing xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-rib">
      <ipv4>
        <static-route>
          <prefix>192.168.0.0/24</prefix>
          <config>
            <prefix>192.168.0.0/24</prefix>
          </config>
          <next-hops-gateway>
            <next-hop-gateway>
              <gateway>172.17.30.2</gateway>
              <config>
                <gateway>172.17.30.2</gateway>
                <interface>xe2</interface>
                <distance>10</distance>
              </config>
            </next-hop-gateway>
            <next-hop-gateway>
              <gateway>172.17.31.2</gateway>
              <config>
                <gateway>172.17.31.2</gateway>
                <interface>xe1</interface>
                <distance>10</distance>
              </config>
            </next-hop-gateway>
          </next-hops-gateway>
        </static-route>
      </ipv4>
    </static-routing>
  </network-instance>
</network-instances>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating a static route with load balancing.

```
    <network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
      <name>TEST_A9</name>
      <config>
        <name>TEST_A9</name>
        <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
      </config>
      <state>
        <name>TEST_A9</name>
        <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
      </state>
      <protocols>
        <protocol xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">
          <identifier>oc-pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <config>
            <identifier>oc-pol-types:DIRECTLY_CONNECTED</identifier>
```

```
            <name>DIRECTLY_CONNECTED</name>
            <enabled>true</enabled>
          </config>
        </protocol>
        <protocol xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">
          <identifier>oc-pol-types:STATIC</identifier>
          <name>static-routes</name>
          <config>
            <identifier>oc-pol-types:STATIC</identifier>
            <name>static-routes</name>
          </config>
          <static-routes>
            <static>
              <prefix>192.168.0.0/24</prefix>
              <next-hops>
                <next-hop>
                  <index>172.17.30.2</index>
                  <interface-ref>
                    <config>
                      <interface>xe2</interface>
                    </config>
                    <state>
                      <interface>xe2</interface>
                    </state>
                  </interface-ref>
                  <config>
                    <metric>10</metric>
                    <index>172.17.30.2</index>
                    <next-hop>172.17.30.2</next-hop>
                  </config>
                  <state>
                    <metric>10</metric>
                    <index>172.17.30.2</index>
                    <next-hop>172.17.30.2</next-hop>
                  </state>
                </next-hop>
                <next-hop>
                  <index>172.17.31.2</index>
                  <interface-ref>
                    <config>
                      <interface>xe1</interface>
                    </config>
                    <state>
                      <interface>xe1</interface>
                    </state>
                  </interface-ref>
                  <config>
                    <metric>10</metric>
                    <index>172.17.31.2</index>
                    <next-hop>172.17.31.2</next-hop>
                  </config>
                  <state>
                    <metric>10</metric>
                    <index>172.17.31.2</index>
                    <next-hop>172.17.31.2</next-hop>
                  </state>
```

```
          </next-hop>
        </next-hops>
        <config>
          <prefix>192.168.0.0/24</prefix>
        </config>
        <state>
          <prefix>192.168.0.0/24</prefix>
          <prefix>192.168.0.0/24</prefix>
        </state>
      </static>
    </static-routes>
  </protocol>
</protocols>
<tables xmlns:oc-types="http://openconfig.net/yang/openconfig-types">
  <table xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">
    <protocol>oc-pol-types:DIRECTLY_CONNECTED</protocol>
    <address-family>oc-types:IPV4</address-family>
    <config>
      <protocol>oc-pol-types:DIRECTLY_CONNECTED</protocol>
      <address-family>oc-types:IPV4</address-family>
    </config>
  </table>
  <table xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">
    <protocol>oc-pol-types:DIRECTLY_CONNECTED</protocol>
    <address-family>oc-types:IPV6</address-family>
    <config>
      <protocol>oc-pol-types:DIRECTLY_CONNECTED</protocol>
      <address-family>oc-types:IPV6</address-family>
    </config>
  </table>
  <table xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">
    <protocol>oc-pol-types:STATIC</protocol>
    <address-family>oc-types:IPV4</address-family>
    <config>
      <protocol>oc-pol-types:STATIC</protocol>
      <address-family>oc-types:IPV4</address-family>
    </config>
  </table>
</tables>
<interfaces>
  <interface>
    <id>lo.TEST_A9</id>
    <config>
      <interface>lo.TEST_A9</interface>
      <id>lo.TEST_A9</id>
    </config>
  </interface>
  <interface>
    <id>xe1</id>
    <config>
      <interface>xe1</interface>
      <id>xe1</id>
    </config>
  </interface>
  <interface>
    <id>xe2</id>
    <config>
```

```
            <interface>xe2</interface>
            <id>xe2</id>
          </config>
        </interface>
      </interfaces>
    </network-instance>
  </network-instances>
```

Restrictions

`/network-instances/network-instance/protocols/protocol/static-routes/static/next-hops/next-hop`

It is necessary to have at least one entry in this list of next hops.

`/network-instances/network-instance/protocols/protocol/static-routes/static/next-hops/next-hop/index`

Whenever config/next-hop leaf is configured, the index must have the same value as the next-hop. If not, the index must match the interface name built from `interface-ref/config/interface` and `interface-ref/config/subinterface`. For example, `xe1`, `xe2.100` and so on.

Create a Static Route with Active/Standby

This XML configuration snippet is used to create two paths to a specified destination prefix and mask for the network and a gateway working in active/standby scenario. With these two links, it is possible to guarantee the service availability. All the traffic must be routed throughout the active link while the passive link must be configured to receive the traffic in case of any failure in the active link.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create a static route with active/standby.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <!-- double link in a single PE of any L3 VPN -->
  <network-instance>
    <name>TEST_A8</name>
    <config>
      <name>TEST_A8</name>
      <type>L3VRF</type>
    </config>
    <interfaces>
      <interface>
        <id>xe2</id>
        <config>
          <id>xe2</id>
          <interface>xe2</interface>
        </config>
      </interface>
      <interface>
```

```
        <id>xe4</id>
        <config>
          <id>xe4</id>
          <interface>xe4</interface>
        </config>
      </interface>
    </interfaces>
    <protocols>
      <protocol>
        <identifier>STATIC</identifier>
        <name>static-route</name>
        <config>
          <identifier>STATIC</identifier>
          <name>static-route</name>
          <enabled>true</enabled>
        </config>
        <static-routes>
          <static>
            <prefix>192.168.0.0/24</prefix>
            <config>
              <prefix>192.168.0.0/24</prefix>
            </config>
            <next-hops>
              <next-hop>
                <index>172.17.30.2</index>
                <config>
                  <index>172.17.30.2</index>
                  <next-hop>172.17.30.2</next-hop>
                  <metric>10</metric>
                </config>
                <interface-ref>
                  <config>
                    <interface>xe2</interface>
                  </config>
                </interface-ref>
              </next-hop>
              <next-hop>
                <index>172.17.40.2</index>
                <config>
                  <index>172.17.40.2</index>
                  <next-hop>172.17.40.2</next-hop>
                  <metric>30</metric>
                </config>
                <interface-ref>
                  <config>
                    <interface>xe4</interface>
                  </config>
                </interface-ref>
              </next-hop>
            </next-hops>
          </static>
        </static-routes>
      </protocol>
    </protocols>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

This CLI command is used to create a static route with active/standby.

```
interface xe2
 ip vrf forwarding TEST_A8
!
interface xe4
 ip vrf forwarding TEST_A8
!
ip route vrf TEST_A8 192.168.0.0/24 172.17.30.2 xe2 10
ip route vrf TEST_A8 192.168.0.0/24 172.17.40.2 xe4 30
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create a static route with active/standby.

```
      <network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
network-instance">
  <network-instance>
    <instance-name>TEST_A8</instance-name>
    <instance-type>vrf</instance-type>
    <config>
      <instance-name>TEST_A8</instance-name>
      <instance-type>vrf</instance-type>
    </config>
    <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
      <config>
        <vrf-name>TEST_A8</vrf-name>
      </config>
    </vrf>
    <static-routing xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-rib">
      <ipv4>
        <static-route>
          <prefix>192.168.0.0/24</prefix>
          <config>
            <prefix>192.168.0.0/24</prefix>
          </config>
          <next-hops-gateway>
            <next-hop-gateway>
              <gateway>172.17.30.2</gateway>
              <config>
                <gateway>172.17.30.2</gateway>
                <interface>xe2</interface>
                <distance>10</distance>
              </config>
            </next-hop-gateway>
            <next-hop-gateway>
              <gateway>172.17.40.2</gateway>
              <config>
                <gateway>172.17.40.2</gateway>
                <interface>xe4</interface>
                <distance>30</distance>
              </config>
            </next-hop-gateway>
          </next-hops-gateway>
```

```
        </static-route>
      </ipv4>
    </static-routing>
  </network-instance>
</network-instances>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating a static route with active/standby.

```
    <network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
      <name>TEST_A8</name>
      <config>
        <name>TEST_A8</name>
        <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
      </config>
      <state>
        <name>TEST_A8</name>
        <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
      </state>
      <protocols>
        <protocol xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">
          <identifier>oc-pol-types:DIRECTLY_CONNECTED</identifier>
          <name>DIRECTLY_CONNECTED</name>
          <config>
            <identifier>oc-pol-types:DIRECTLY_CONNECTED</identifier>
            <name>DIRECTLY_CONNECTED</name>
            <enabled>true</enabled>
          </config>
        </protocol>
        <protocol xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">
          <identifier>oc-pol-types:STATIC</identifier>
          <name>static-routes</name>
          <config>
            <identifier>oc-pol-types:STATIC</identifier>
            <name>static-routes</name>
          </config>
          <static-routes>
            <static>
              <prefix>192.168.0.0/24</prefix>
              <next-hops>
                <next-hop>
                  <index>172.17.30.2</index>
                  <interface-ref>
                    <config>
                      <interface>xe2</interface>
                    </config>
                    <state>
                      <interface>xe2</interface>
                    </state>
                  </interface-ref>
```

```
            <config>
              <metric>10</metric>
              <index>172.17.30.2</index>
              <next-hop>172.17.30.2</next-hop>
            </config>
            <state>
              <metric>10</metric>
              <index>172.17.30.2</index>
              <next-hop>172.17.30.2</next-hop>
            </state>
          </next-hop>
          <next-hop>
            <index>172.17.40.2</index>
            <interface-ref>
              <config>
                <interface>xe4</interface>
              </config>
              <state>
                <interface>xe4</interface>
              </state>
            </interface-ref>
            <config>
              <metric>30</metric>
              <index>172.17.40.2</index>
              <next-hop>172.17.40.2</next-hop>
            </config>
            <state>
              <metric>30</metric>
              <index>172.17.40.2</index>
              <next-hop>172.17.40.2</next-hop>
            </state>
          </next-hop>
        </next-hops>
        <config>
          <prefix>192.168.0.0/24</prefix>
        </config>
        <state>
          <prefix>192.168.0.0/24</prefix>
          <prefix>192.168.0.0/24</prefix>
        </state>
      </static>
    </static-routes>
  </protocol>
</protocols>
<tables xmlns:oc-types="http://openconfig.net/yang/openconfig-types">
  <table xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">
    <protocol>oc-pol-types:DIRECTLY_CONNECTED</protocol>
    <address-family>oc-types:IPV4</address-family>
    <config>
      <protocol>oc-pol-types:DIRECTLY_CONNECTED</protocol>
      <address-family>oc-types:IPV4</address-family>
    </config>
  </table>
  <table xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">
    <protocol>oc-pol-types:DIRECTLY_CONNECTED</protocol>
    <address-family>oc-types:IPV6</address-family>
    <config>
```

```
            <protocol>oc-pol-types:DIRECTLY_CONNECTED</protocol>
            <address-family>oc-types:IPV6</address-family>
          </config>
        </table>
        <table xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">
          <protocol>oc-pol-types:STATIC</protocol>
          <address-family>oc-types:IPV4</address-family>
          <config>
            <protocol>oc-pol-types:STATIC</protocol>
            <address-family>oc-types:IPV4</address-family>
          </config>
        </table>
      </tables>
      <interfaces>
        <interface>
          <id>lo.TEST_A8</id>
          <config>
            <interface>lo.TEST_A8</interface>
            <id>lo.TEST_A8</id>
          </config>
        </interface>
        <interface>
          <id>xe2</id>
          <config>
            <interface>xe2</interface>
            <id>xe2</id>
          </config>
        </interface>
        <interface>
          <id>xe4</id>
          <config>
            <interface>xe4</interface>
            <id>xe4</id>
          </config>
        </interface>
      </interfaces>
    </network-instance>
  </network-instances>
```

Restrictions

`/network-instances/network-instance/protocols/protocol/static-routes/static/next-hops/next-hop`

It is necessary to have at least one entry in this list of next hops.

`/network-instances/network-instance/protocols/protocol/static-routes/static/next-hops/next-hop/index`

Whenever config/next-hop leaf is configured, the index must have the same value as the next-hop. If not, the index must match the interface name built from `interface-ref/config/interface` and `interface-ref/config/subinterface`. For example, `xe1`, `xe2.100` and so on.

Use Cases

This section covers the scenarios that can be accomplished using OpenConfig configuration XML files, showing complex interactions between different objects.

Create a VRF Static Route without Egress Interface

This XML configuration snippet is used to create an user VRF Static Route without specifying the egress interface. It was mandatory to specify the interface for versions below OcNOS 6.6.0.

Release

This configuration was introduced in OcNOS version 6.6.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create an user VRF Static Route without egress interface.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
        <name>TEST_A9</name>
        <config>
            <name>TEST_A9</name>
            <type xmlns:oc-ni-types="http://openconfig.net/yang/network-
instance-types">oc-ni-types:L3VRF</type>
        </config>
        <protocols>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                <name>DIRECTLY_CONNECTED</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                    <name>DIRECTLY_CONNECTED</name>
                    <enabled>true</enabled>
                </config>
            </protocol>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</identifier>
                <name>static-routes</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:STATIC</identifier>
                    <name>static-routes</name>
                </config>
                <static-routes>
                    <static>
                        <prefix>192.168.0.0/24</prefix>
                        <next-hops>
                            <next-hop>
                                <index>172.17.30.2</index>
```

```
                                <config>
                                    <metric>10</metric>
                                    <index>172.17.30.2</index>
                                    <next-hop>172.17.30.2</next-hop>
                                </config>
                            </next-hop>
                        </next-hops>
                        <config>
                            <prefix>192.168.0.0/24</prefix>
                        </config>
                    </static>
                </static-routes>
            </protocol>
        </protocols>
        <tables>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV6</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV6</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
        </tables>
    </network-instance>
</network-instances>
```

OcNOS CLI Command

This CLI command is used to create an user VRF Static Route without egress interface.

```
interface xe2
 ip vrf forwarding TEST_A9
!
ip route vrf TEST_A9 192.168.0.0/24 172.17.30.2 10
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create an user VRF Static Route without egress interface.

```
      <network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
network-instance">
  <network-instance>
    <instance-name>TEST_A9</instance-name>
    <instance-type>vrf</instance-type>
    <config>
      <instance-name>TEST_A9</instance-name>
      <instance-type>vrf</instance-type>
    </config>
    <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
      <config>
        <vrf-name>TEST_A9</vrf-name>
      </config>
    </vrf>
    <static-routing xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-rib">
      <ipv4>
        <static-route>
          <prefix>192.168.0.0/24</prefix>
          <config>
            <prefix>192.168.0.0/24</prefix>
          </config>
          <next-hops-gateway>
            <next-hop-gateway>
              <gateway>172.17.30.2</gateway>
              <config>
                <gateway>172.17.30.2</gateway>
                <distance>10</distance>
              </config>
            </next-hop-gateway>
          </next-hops-gateway>
        </static-route>
      </ipv4>
    </static-routing>
  </network-instance>
</network-instances>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating an user VRF Static Route without egress interface.

```
      <network-instances xmlns="http://openconfig.net/yang/network-instance">
      <network-instance>
```

```
        <name>TEST_A9</name>
        <config>
          <name>TEST_A9</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
        </config>
        <state>
          <name>TEST_A9</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
        </state>
        <protocols>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
            <name>DIRECTLY_CONNECTED</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
              <name>DIRECTLY_CONNECTED</name>
              <enabled>true</enabled>
            </config>
          </protocol>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:STATIC</identifier>
            <name>static-routes</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:STATIC</identifier>
              <name>static-routes</name>
            </config>
            <static-routes>
              <static>
                <prefix>192.168.0.0/24</prefix>
                <next-hops>
                  <next-hop>
                    <index>172.17.30.2</index>
                    <config>
                      <metric>10</metric>
                      <index>172.17.30.2</index>
                      <next-hop>172.17.30.2</next-hop>
                    </config>
                    <state>
                      <metric>10</metric>
                      <index>172.17.30.2</index>
                      <next-hop>172.17.30.2</next-hop>
                    </state>
                  </next-hop>
                </next-hops>
                <config>
                  <prefix>192.168.0.0/24</prefix>
```

```
                </config>
                <state>
                  <prefix>192.168.0.0/24</prefix>
                </state>
              </static>
            </static-routes>
          </protocol>
        </protocols>
        <tables>
          <table>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
            <config>
              <protocol
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
              <address-family
                xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV4</address-family>
            </config>
          </table>
          <table>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
            <config>
              <protocol
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
              <address-family
                xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV6</address-family>
            </config>
          </table>
          <table>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:STATIC</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
            <config>
              <protocol
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:STATIC</protocol>
              <address-family
                xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV4</address-family>
            </config>
          </table>
        </tables>
        <interfaces>
```

```
            <interface>
              <id>lo.TEST_A9</id>
              <config>
                <interface>lo.TEST_A9</interface>
                <id>lo.TEST_A9</id>
              </config>
            </interface>

          </network-instance>
        </network-instances>
```

Restrictions

None

Create a Static Route with Next-hop Recursive Lookup Enabled

This XML configuration snippet is used to create a Static Route with next-hop recursive lookup enabled. This was the default behavior for versions below OcNOS 6.6.0.

Release

This configuration was introduced in OcNOS version 6.6.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create a Static Route with next-hop recursive lookup enabled.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
        <name>TEST_A9</name>
        <config>
            <name>TEST_A9</name>
            <type xmlns:oc-ni-types="http://openconfig.net/yang/network-
instance-types">oc-ni-types:L3VRF</type>
        </config>
        <protocols>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                <name>DIRECTLY_CONNECTED</name>
                <config>
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
                    <name>DIRECTLY_CONNECTED</name>
                    <enabled>true</enabled>
                </config>
            </protocol>
            <protocol>
                <identifier xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</identifier>
                <name>static-routes</name>
                <config>
```

```
                    <identifier xmlns:oc-pol-types="http://openconfig.net/
yang/policy-types">oc-pol-types:STATIC</identifier>
                    <name>static-routes</name>
                </config>
                <static-routes>
                    <static>
                        <prefix>192.168.0.0/24</prefix>
                        <next-hops>
                            <next-hop>
                                <index>172.17.30.2</index>
                                <config>
                                    <metric>10</metric>
                                    <recurse>true</recurse>
                                    <index>172.17.30.2</index>
                                    <next-hop>172.17.30.2</next-hop>
                                </config>
                            </next-hop>
                        </next-hops>
                        <config>
                            <prefix>192.168.0.0/24</prefix>
                        </config>
                    </static>
                </static-routes>
            </protocol>
        </protocols>
        <tables>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV6</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV6</address-family>
                </config>
            </table>
            <table>
                <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</protocol>
                <address-family xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">oc-types:IPV4</address-family>
                <config>
                    <protocol xmlns:oc-pol-types="http://openconfig.net/yang/
policy-types">oc-pol-types:STATIC</protocol>
```

```
                    <address-family xmlns:oc-types="http://openconfig.net/
yang/openconfig-types">oc-types:IPV4</address-family>
                </config>
            </table>
        </tables>
    </network-instance>
</network-instances>
```

OcNOS CLI Command

This CLI command is used to create a Static Route with next-hop recursive lookup enabled.

```
interface xe2
 ip vrf forwarding TEST_A9
!
ip route vrf TEST_A9 192.168.0.0/24 172.17.30.2 recursive
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create a Static Route with next-hop recursive lookup enabled.

```
      <network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
network-instance">
  <network-instance>
    <instance-name>TEST_A9</instance-name>
    <instance-type>vrf</instance-type>
    <config>
      <instance-name>TEST_A9</instance-name>
      <instance-type>vrf</instance-type>
    </config>
    <vrf xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vrf">
      <config>
        <vrf-name>TEST_A9</vrf-name>
      </config>
    </vrf>
    <static-routing xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-rib">
      <ipv4>
        <static-route>
          <prefix>192.168.0.0/24</prefix>
          <config>
            <prefix>192.168.0.0/24</prefix>
          </config>
          <next-hops-gateway>
            <next-hop-gateway>
              <gateway>172.17.30.2</gateway>
              <config>
                <gateway>172.17.30.2</gateway>
                <recursive></recursive>
              </config>
            </next-hop-gateway>
          </next-hops-gateway>
        </static-route>
      </ipv4>
    </static-routing>
  </network-instance>
</network-instances>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating a Static Route with next-hop recursive lookup enabled.

```
          <network-instances xmlns="http://openconfig.net/yang/network-
instance">
      <network-instance>
        <name>TEST_A9</name>
        <config>
          <name>TEST_A9</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
        </config>
        <state>
          <name>TEST_A9</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L3VRF</type>
        </state>
        <protocols>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</identifier>
            <name>DIRECTLY_CONNECTED</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</identifier>
              <name>DIRECTLY_CONNECTED</name>
              <enabled>true</enabled>
            </config>
          </protocol>
          <protocol>
            <identifier
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:STATIC</identifier>
            <name>static-routes</name>
            <config>
              <identifier
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:STATIC</identifier>
              <name>static-routes</name>
            </config>
            <static-routes>
              <static>
                <prefix>192.168.0.0/24</prefix>
                <next-hops>
                  <next-hop>
                    <index>172.17.30.2</index>
                    <config>
                      <metric>10</metric>
                      <index>172.17.30.2</index>
                      <next-hop>172.17.30.2</next-hop>
                    </config>
                    <state>
```

```
                    <metric>10</metric>
                    <recurse>true</recurse>
                    <index>172.17.30.2</index>
                    <next-hop>172.17.30.2</next-hop>
                  </state>
                </next-hop>
              </next-hops>
              <config>
                <prefix>192.168.0.0/24</prefix>
              </config>
              <state>
                <prefix>192.168.0.0/24</prefix>
              </state>
            </static>
          </static-routes>
        </protocol>
      </protocols>
      <tables>
        <table>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
          <config>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV4</address-family>
          </config>
        </table>
        <table>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:DIRECTLY_CONNECTED</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV6</address-family>
          <config>
            <protocol
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:DIRECTLY_CONNECTED</protocol>
            <address-family
              xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV6</address-family>
          </config>
        </table>
        <table>
          <protocol
            xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:STATIC</protocol>
          <address-family
            xmlns:oc-types="http://openconfig.net/yang/openconfig-types">oc-
types:IPV4</address-family>
          <config>
```

```
              <protocol
                xmlns:oc-pol-types="http://openconfig.net/yang/policy-
types">oc-pol-types:STATIC</protocol>
              <address-family
                xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">oc-types:IPV4</address-family>
            </config>
          </table>
        </tables>
        <interfaces>
          <interface>
            <id>lo.TEST_A9</id>
            <config>
              <interface>lo.TEST_A9</interface>
              <id>lo.TEST_A9</id>
            </config>
          </interface>
      </network-instance>
    </network-instances>
```

Restrictions

None

Platform OpenConfig Translation

Description

The read-only state attributes listed here are valid for the platform Edgecore 5912-54X-O-AC-F.

FAN

This platform type displays the fan status of the boards.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <state>
        <type>oc-platform-types:FAN</type>
      </state>
      <fan></fan>
    </component>
  </components>
</filter>
```

Get OpenConfig Return

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
  <components xmlns="http://openconfig.net/yang/platform">
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-1/1</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-1/1</id>
        <name>FAN-1/1</name>
        <parent>FAN_TRAY-1</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
```

```
        <location>1</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">9800</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-1/2</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-1/2</id>
        <name>FAN-1/2</name>
        <parent>FAN_TRAY-1</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>2</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">8300</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-2/1</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-2/1</id>
        <name>FAN-2/1</name>
        <parent>FAN_TRAY-2</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
```

```
        <mfg-name>NA</mfg-name>
        <location>1</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">10400</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-2/2</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-2/2</id>
        <name>FAN-2/2</name>
        <parent>FAN_TRAY-2</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>2</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">8700</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-3/1</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-3/1</id>
        <name>FAN-3/1</name>
        <parent>FAN_TRAY-3</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
```

```
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>1</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">10300</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-3/2</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-3/2</id>
        <name>FAN-3/2</name>
        <parent>FAN_TRAY-3</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>2</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">8700</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-4/1</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-4/1</id>
        <name>FAN-4/1</name>
        <parent>FAN_TRAY-4</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
```

```
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>1</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">10200</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-4/2</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-4/2</id>
        <name>FAN-4/2</name>
        <parent>FAN_TRAY-4</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>2</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">8600</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-5/1</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-5/1</id>
        <name>FAN-5/1</name>
        <parent>FAN_TRAY-5</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
```

```
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>1</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">10000</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-5/2</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-5/2</id>
        <name>FAN-5/2</name>
        <parent>FAN_TRAY-5</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>2</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">8400</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-6/1</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-6/1</id>
        <name>FAN-6/1</name>
        <parent>FAN_TRAY-6</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
```

```
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>1</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">10100</speed>
        </state>
      </fan>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>FAN-6/2</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>FAN-6/2</id>
        <name>FAN-6/2</name>
        <parent>FAN_TRAY-6</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>2</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:FAN</type>
      </state>
      <fan>
        <state>
          <speed xmlns="http://openconfig.net/yang/platform/fan">8500</speed>
        </state>
      </fan>
    </component>
```

Get OcNOS Result

Here is the NetConf response in IPI datamodel representation.

```
  <components xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
    <component>
      <name>FAN-1/1</name>
      <state>
        <name>FAN-1/1</name>
        <parent>FAN_TRAY-1</parent>
        <product-name>NA</product-name>
```

```
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>1</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>front</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>21500</maximum-rpm>
        <minimum-rpm>10000</minimum-rpm>
        <rpm>9800</rpm>
        <fan-index>1</fan-index>
      </state>
    </fan>
  </component>
  <component>
    <name>FAN-1/2</name>
    <state>
      <name>FAN-1/2</name>
      <parent>FAN_TRAY-1</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>2</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>rear</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>18000</maximum-rpm>
        <minimum-rpm>8500</minimum-rpm>
        <rpm>8300</rpm>
        <fan-index>2</fan-index>
      </state>
    </fan>
  </component>
  <component>
    <name>FAN-2/1</name>
    <state>
      <name>FAN-2/1</name>
      <parent>FAN_TRAY-2</parent>
```

```
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>1</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>front</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>21500</maximum-rpm>
        <minimum-rpm>10000</minimum-rpm>
        <rpm>10400</rpm>
        <fan-index>1</fan-index>
      </state>
    </fan>
  </component>
  <component>
    <name>FAN-2/2</name>
    <state>
      <name>FAN-2/2</name>
      <parent>FAN_TRAY-2</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>2</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>rear</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>18000</maximum-rpm>
        <minimum-rpm>8500</minimum-rpm>
        <rpm>8700</rpm>
        <fan-index>2</fan-index>
      </state>
    </fan>
  </component>
  <component>
    <name>FAN-3/1</name>
    <state>
      <name>FAN-3/1</name>
```

```
      <parent>FAN_TRAY-3</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>1</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>front</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>21500</maximum-rpm>
        <minimum-rpm>10000</minimum-rpm>
        <rpm>10300</rpm>
        <fan-index>1</fan-index>
      </state>
    </fan>
  </component>
  <component>
    <name>FAN-3/2</name>
    <state>
      <name>FAN-3/2</name>
      <parent>FAN_TRAY-3</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>2</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>rear</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>18000</maximum-rpm>
        <minimum-rpm>8500</minimum-rpm>
        <rpm>8700</rpm>
        <fan-index>2</fan-index>
      </state>
    </fan>
  </component>
  <component>
    <name>FAN-4/1</name>
    <state>
```

```
      <name>FAN-4/1</name>
      <parent>FAN_TRAY-4</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>1</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>front</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>21500</maximum-rpm>
        <minimum-rpm>10000</minimum-rpm>
        <rpm>10200</rpm>
        <fan-index>1</fan-index>
      </state>
    </fan>
  </component>
  <component>
    <name>FAN-4/2</name>
    <state>
      <name>FAN-4/2</name>
      <parent>FAN_TRAY-4</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>2</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>rear</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>18000</maximum-rpm>
        <minimum-rpm>8500</minimum-rpm>
        <rpm>8600</rpm>
        <fan-index>2</fan-index>
      </state>
    </fan>
  </component>
  <component>
    <name>FAN-5/1</name>
```

```
    <state>
      <name>FAN-5/1</name>
      <parent>FAN_TRAY-5</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>1</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>front</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>21500</maximum-rpm>
        <minimum-rpm>10000</minimum-rpm>
        <rpm>10000</rpm>
        <fan-index>1</fan-index>
      </state>
    </fan>
  </component>
  <component>
    <name>FAN-5/2</name>
    <state>
      <name>FAN-5/2</name>
      <parent>FAN_TRAY-5</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>2</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>rear</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>18000</maximum-rpm>
        <minimum-rpm>8500</minimum-rpm>
        <rpm>8400</rpm>
        <fan-index>2</fan-index>
      </state>
    </fan>
  </component>
  <component>
```

```
    <name>FAN-6/1</name>
    <state>
      <name>FAN-6/1</name>
      <parent>FAN_TRAY-6</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>1</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>front</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>21500</maximum-rpm>
        <minimum-rpm>10000</minimum-rpm>
        <rpm>10100</rpm>
        <fan-index>1</fan-index>
      </state>
    </fan>
  </component>
  <component>
    <name>FAN-6/2</name>
    <state>
      <name>FAN-6/2</name>
      <parent>FAN_TRAY-6</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>false</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>2</location>
      <type>fan</type>
    </state>
    <fan>
      <state>
        <fan-location>rear</fan-location>
        <fan-status>running</fan-status>
        <maximum-rpm>18000</maximum-rpm>
        <minimum-rpm>8500</minimum-rpm>
        <rpm>8500</rpm>
        <fan-index>2</fan-index>
      </state>
    </fan>
  </component>
```

Show command

Here is Show command output that displays the hardware information for the fan.

```
OcNOS#show hardware-information fan

Codes : R - Rear Fan, F - Front Fan, U - Unknown
-----------------------------------------------------------
FAN TRAY     FAN          RPM          MINRPM       MAXRPM
-----------------------------------------------------------
1            1(F)         9800         10000        21500
1            2(R)         8300         8500         18000
2            1(F)         10400        10000        21500
2            2(R)         8700         8500         18000
3            1(F)         10300        10000        21500
3            2(R)         8700         8500         18000
4            1(F)         10100        10000        21500
4            2(R)         8600         8500         18000
5            1(F)         10000        10000        21500
5            2(R)         8400         8500         18000
6            1(F)         10100        10000        21500
6            2(R)         8500         8500         18000
```

RAM

This platform type displays the memory information of the boards.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>RAM</name>
    </component>
  </components>
</filter>
```

Get OpenConfig Return

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
  <components xmlns="http://openconfig.net/yang/platform">
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>RAM</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>RAM</id>
        <name>RAM</name>
        <parent>CHASSIS</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
```

```
          <removable>false</removable>
          <part-no>NA</part-no>
          <serial-no>NA</serial-no>
          <software-version>NA</software-version>
          <firmware-version>NA</firmware-version>
          <hardware-version>NA</hardware-version>
          <description>NA</description>
          <mfg-name>NA</mfg-name>
          <location>0</location>
          <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:RAM</type>
          <memory>
            <utilized>1118830592</utilized>
            <available>16792944640</available>
          </memory>
        </state>
      </component>
    </components>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
    <components xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
      <component>
        <name>RAM</name>
        <state>
          <name>RAM</name>
          <parent>CHASSIS</parent>
          <product-name>NA</product-name>
          <oper-status>NA</oper-status>
          <removable>false</removable>
          <part-no>NA</part-no>
          <serial-no>NA</serial-no>
          <software-version>NA</software-version>
          <firmware-version>NA</firmware-version>
          <hardware-version>NA</hardware-version>
          <description>NA</description>
          <mfg-name>NA</mfg-name>
          <location>0</location>
          <type>ram</type>
          <memory>
            <utilized>1066</utilized>
            <available>16015</available>
          </memory>
        </state>
        <ram>
          <state>
            <usage-alert-threshold>90</usage-alert-threshold>
            <usage-critical-threshold>80</usage-critical-threshold>
            <unit-size>1</unit-size>
            <available-high-memory>0</available-high-memory>
            <total-high-memory>0</total-high-memory>
            <current-process-count>214</current-process-count>
            <free-swap>0</free-swap>
            <total-swap>0</total-swap>
```

```
          <buffers>18</buffers>
          <shared-memory>8</shared-memory>
          <available-memory>14948</available-memory>
          <used-memory>1066</used-memory>
          <total-memory>16015</total-memory>
        </state>
      </ram>
    </component>
  </components>
```

Show command

Here is Show command output that displays the hardware information for the RAM.

```
OcNOS#show hardware-information memory
-------------------------------------------------------
        RAM INFORMATION
-------------------------------------------------------

Total                                    : 16015 MB
Used                                     : 1067 MB (7 %)
Free                                     : 14947 MB (93 %)
Shared                                   : 8 MB
Buffers                                  : 17 MB
Total Swap                               : 0 MB
Free Swap                                : 0 MB
Current Processes                        : 217
Total High Memory                        : 0 MB
Available High Memory                    : 0 MB
Unit Size                                : 1 Bytes
Alert Threshold                          : 90 %
Critical Threshold                       : 80 %
-------------------------------------------------------
        HARD DISK INFORMATION
-------------------------------------------------------

Serial Number                            : F929740043
Model Number                             : TS32GMSA370
Firmware Revision                        : P1225CH1TS32GMSA370
Cylinders                                : 16383
Heads                                    : 16
Sectors                                  : 62533296
Unformatted Bytes/Track                  : 0
Unformatted Bytes/Sector                 : 0
Revision No                              : 1008.0
Usage Alert Threshold                    : 90 %
Usage Critical Threshold                 : 80 %
-------------------------------------------------------------
Filesystem   Total        Used         Free         Use%
-------------------------------------------------------------
/            22000        6446         15554        29%
/cfg         476          90           386          19%
/installers  4911         282          4629         6%
-------------------------------------------------------------
```

Hard-disk

This platform type displays hard-disk information of the boards.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>HARD-DISK</name>
    </component>
  </components>
</filter>
```

Get OpenConfig Return

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
  <components xmlns="http://openconfig.net/yang/platform">
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>HARD-DISK</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>HARD-DISK</id>
        <name>HARD-DISK</name>
        <parent>CHASSIS</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>0</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:STORAGE</type>
        <memory>
          <utilized>6759120896</utilized>
          <available>23068672000</available>
        </memory>
      </state>
    </component>
  </components>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
  <components xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
    <component>
      <name>HARD-DISK</name>
      <state>
        <name>HARD-DISK</name>
        <parent>CHASSIS</parent>
        <product-name>NA</product-name>
        <oper-status>NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>0</location>
        <type>storage</type>
        <memory>
          <utilized>6446</utilized>
          <available>22000</available>
        </memory>
      </state>
      <storage>
        <state>
          <usage-alert-threshold>90</usage-alert-threshold>
          <usage-critical-threshold>80</usage-critical-threshold>
          <free-memory>15554</free-memory>
          <used-memory>6446</used-memory>
          <total-memory>22000</total-memory>
          <revision-number>1008.0</revision-number>
          <unformatted-bytes-or-sector>0</unformatted-bytes-or-sector>
          <unformatted-bytes-or-track>0</unformatted-bytes-or-track>
          <sector-count>62533296</sector-count>
          <head-count>16</head-count>
          <cylinder-count>16383</cylinder-count>
          <firmware-revision>P1225CH1TS32GMSA370                </firmware-
revision>
          <model-number>TS32GMSA370                    </model-number>
          <serial-number>F929740043          </serial-number>
        </state>
        <mounted-filesystems>
          <mounted-filesystem>
            <mount-point>/</mount-point>
            <state>
              <mount-point>/</mount-point>
              <usage>29</usage>
              <free>15554</free>
              <used>6446</used>
              <total>22000</total>
            </state>
          </mounted-filesystem>
          <mounted-filesystem>
            <mount-point>/cfg</mount-point>
            <state>
              <mount-point>/cfg</mount-point>
              <usage>19</usage>
```

```
              <free>386</free>
              <used>90</used>
              <total>476</total>
            </state>
          </mounted-filesystem>
          <mounted-filesystem>
            <mount-point>/installers</mount-point>
            <state>
              <mount-point>/installers</mount-point>
              <usage>6</usage>
              <free>4629</free>
              <used>282</used>
              <total>4911</total>
            </state>
          </mounted-filesystem>
        </mounted-filesystems>
      </storage>
    </component>
  </components>
```

Show command

Here is Show command output that displays the hardware information of the hard-disk.

```
OcNOS#show hardware-information memory
-------------------------------------------------------
        RAM INFORMATION
-------------------------------------------------------

Total                                    : 16015 MB
Used                                     : 1067 MB (7 %)
Free                                     : 14947 MB (93 %)
Shared                                   : 8 MB
Buffers                                  : 17 MB
Total Swap                               : 0 MB
Free Swap                                : 0 MB
Current Processes                        : 217
Total High Memory                        : 0 MB
Available High Memory                    : 0 MB
Unit Size                                : 1 Bytes
Alert Threshold                          : 90 %
Critical Threshold                       : 80 %
-------------------------------------------------------
        HARD DISK INFORMATION
-------------------------------------------------------

Serial Number                            : F929740043
Model Number                             : TS32GMSA370
Firmware Revision                        : P1225CH1TS32GMSA370
Cylinders                                : 16383
Heads                                    : 16
Sectors                                  : 62533296
Unformatted Bytes/Track                  : 0
Unformatted Bytes/Sector                 : 0
Revision No                              : 1008.0
Usage Alert Threshold                    : 90 %
Usage Critical Threshold                 : 80 %
```

```
-------------------------------------------------------------
Filesystem   Total        Used         Free         Use%
-------------------------------------------------------------
/            22000        6446         15554        29%
/cfg         476          90           386          19%
/installers  4911         282          4629         6%
-------------------------------------------------------------
```

PSU

This platform type displays Power Supply Unit (PSU) information.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <state>
        <type>oc-platform-types:POWER_SUPPLY</type>
      </state>
      <power-supply/>
    </component>
  </components>
</filter>
```

Get OpenConfig Return

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
  <components xmlns="http://openconfig.net/yang/platform">
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>PSU-1</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>PSU-1</id>
        <name>PSU-1</name>
        <parent>CHASSIS</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>YM-2651Y</part-no>
        <serial-no>TA100V582031000097</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>3Y POWER</mfg-name>
        <location>1</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:POWER_SUPPLY</type>
```

```
      </state>
      <power-supply>
        <state>
          <output-current xmlns="http://openconfig.net/yang/platform/
psu">8.88</output-current>
          <output-voltage xmlns="http://openconfig.net/yang/platform/
psu">11.81</output-voltage>
          <output-power xmlns="http://openconfig.net/yang/platform/
psu">104.00</output-power>
          <enabled xmlns="http://openconfig.net/yang/platform/psu">true</
enabled>
        </state>
      </power-supply>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>PSU-2</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>PSU-2</id>
        <name>PSU-2</name>
        <parent>CHASSIS</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>2</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:POWER_SUPPLY</type>
      </state>
      <power-supply>
        <state>
          <enabled xmlns="http://openconfig.net/yang/platform/psu">false</
enabled>
        </state>
      </power-supply>
    </component>
  </components>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
  <components xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
    <component>
      <name>PSU-1</name>
      <state>
        <name>PSU-1</name>
        <parent>CHASSIS</parent>
        <product-name>NA</product-name>
```

```
          <oper-status>NA</oper-status>
          <removable>true</removable>
          <part-no>YM-2651Y</part-no>
          <serial-no>TA100V582031000097</serial-no>
          <software-version>NA</software-version>
          <firmware-version>NA</firmware-version>
          <hardware-version>NA</hardware-version>
          <description>NA</description>
          <mfg-name>3Y POWER</mfg-name>
          <location>1</location>
          <type>power-supply</type>
        </state>
        <power-supply>
          <state>
            <supported-parameters>volt-in volt-out curr-in curr-out power-in
power-out temp-1 temp-2 fan-1 fan-2</supported-parameters>
            <output-power-status>good</output-power-status>
            <input-power-status>good</input-power-status>
            <fan1-rpm>26688</fan1-rpm>
            <temperature-sensor2>31.00</temperature-sensor2>
            <temperature-sensor1>27.00</temperature-sensor1>
            <output-current>8.88</output-current>
            <output-voltage>11.81</output-voltage>
            <power-consumption>105.00</power-consumption>
            <hot-swap-state>unknown</hot-swap-state>
            <operational-status>running</operational-status>
          </state>
        </power-supply>
      </component>
      <component>
        <name>PSU-2</name>
        <state>
          <name>PSU-2</name>
          <parent>CHASSIS</parent>
          <product-name>NA</product-name>
          <oper-status>NA</oper-status>
          <removable>true</removable>
          <part-no>NA</part-no>
          <serial-no>NA</serial-no>
          <software-version>NA</software-version>
          <firmware-version>NA</firmware-version>
          <hardware-version>NA</hardware-version>
          <description>NA</description>
          <mfg-name>NA</mfg-name>
          <location>2</location>
          <type>power-supply</type>
        </state>
        <power-supply>
          <state>
            <supported-parameters>volt-in volt-out curr-in curr-out power-in
power-out temp-1 temp-2 fan-1 fan-2</supported-parameters>
            <output-power-status>fail</output-power-status>
            <input-power-status>fail</input-power-status>
            <temperature-sensor2>0.00</temperature-sensor2>
            <temperature-sensor1>0.00</temperature-sensor1>
            <hot-swap-state>unknown</hot-swap-state>
            <operational-status>faulty</operational-status>
```

```
        </state>
      </power-supply>
    </component>

  <components xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
    <component>
      <name>POWER-RAIL</name>
      <state>
        <name>POWER-RAIL</name>
        <parent>CHASSIS</parent>
        <product-name>NA</product-name>
        <oper-status>NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>0</location>
        <type>power-rail</type>
      </state>
      <power-rail>
        <state>
          <power-supply-2-ac-alert-power-rail>fail</power-supply-2-ac-alert-
power-rail>
          <power-supply-1-ac-alert-power-rail>good</power-supply-1-ac-alert-
power-rail>
          <power-supply-2-v12-power-rail>fail</power-supply-2-v12-power-rail>
          <power-supply-1-v12-power-rail>good</power-supply-1-v12-power-rail>
        </state>
      </power-rail>
    </component>
  </components>
```

Show command

Here is Show command output that displays the hardware information for the power supply unit.

```
OcNOS#show hardware-information power

-----------------------------------------------------
    System Power Information
-----------------------------------------------------
CMM_PS1_12V_PG                          : GOOD
CMM_PS2_12V_PG                          : FAIL
CMM_PS1_AC_ALERT                        : GOOD
CMM_PS2_AC_ALERT                        : FAIL

Codes:     * Not Supported by device    NA Not Applicable

PSU         VOLT-IN     VOLT-OUT    CURR-IN     CURR-OUT    PWR-IN      PWR-OUT
TEMP-1      TEMP-2      FAN-1       FAN-2       PWR_OUT_MAX
            (Volt)      (Volt)      (Ampere)    (Ampere)    (Watt)      (Watt)
(Celsius)   (Celsius)   (Rpm)       (Rpm)
```

```
-------------------------------------------------------------------------------
-------------------------------------------------
1          NA          11.82       NA          8.80        NA          104.00
27.00      31.00       26688       NA*         NA*
```

Temperature

This platform type displays temperature sensor information of the boards.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <state>
        <temperature/>
      </state>
    </component>
  </components>
</filter>
```

Get OpenConfig return

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
  <components xmlns="http://openconfig.net/yang/platform">
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>TEMPERATURE-SENSOR1</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>TEMPERATURE-SENSOR1</id>
        <name>TEMPERATURE-SENSOR1</name>
        <temperature xmlns="http://openconfig.net/yang/platform">
          <alarm-severity>oc-alarm-types:UNKNOWN</alarm-severity>
          <alarm-threshold>0</alarm-threshold>
          <alarm-status>false</alarm-status>
          <interval xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">60000000000</interval>
          <avg xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">29.98</avg>
          <max xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">30.00</max>
          <min xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">29.00</min>
          <instant xmlns:oc-platform-types="http://openconfig.net/yang/
platform-types">30.00</instant>
        </temperature>
      </state>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>TEMPERATURE-SENSOR2</name>
```

```
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>TEMPERATURE-SENSOR2</id>
        <name>TEMPERATURE-SENSOR2</name>
        <temperature xmlns="http://openconfig.net/yang/platform">
          <alarm-severity>oc-alarm-types:UNKNOWN</alarm-severity>
          <alarm-threshold>0</alarm-threshold>
          <alarm-status>false</alarm-status>
          <interval xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">60000000000</interval>
          <avg xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">28.98</avg>
          <max xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">29.00</max>
          <min xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">28.00</min>
          <instant xmlns:oc-platform-types="http://openconfig.net/yang/
platform-types">29.00</instant>
        </temperature>
      </state>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>TEMPERATURE-SENSOR3</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>TEMPERATURE-SENSOR3</id>
        <name>TEMPERATURE-SENSOR3</name>
        <temperature xmlns="http://openconfig.net/yang/platform">
          <alarm-severity>oc-alarm-types:UNKNOWN</alarm-severity>
          <alarm-threshold>0</alarm-threshold>
          <alarm-status>false</alarm-status>
          <interval xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">60000000000</interval>
          <avg xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">28.07</avg>
          <max xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">29.00</max>
          <min xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">28.00</min>
          <instant xmlns:oc-platform-types="http://openconfig.net/yang/
platform-types">28.00</instant>
        </temperature>
      </state>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>TEMPERATURE-BCM Chip</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>TEMPERATURE-BCM Chip</id>
        <name>TEMPERATURE-BCM Chip</name>
        <temperature xmlns="http://openconfig.net/yang/platform">
          <alarm-severity>oc-alarm-types:UNKNOWN</alarm-severity>
          <alarm-threshold>0</alarm-threshold>
          <alarm-status>false</alarm-status>
          <interval xmlns:oc-types="http://openconfig.net/yang/openconfig-
types">60000000000</interval>
          <avg xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">48.49</avg>
```

```
          <max xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">49.60</max>
          <min xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">45.70</min>
          <instant xmlns:oc-platform-types="http://openconfig.net/yang/
platform-types">48.60</instant>
        </temperature>
      </state>
    </component>
  </components>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
  <components xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
    <component>
      <name>TEMPERATURE-SENSOR1</name>
      <state>
        <name>TEMPERATURE-SENSOR1</name>
        <temperature>
          <maximum-critical-temperature>60.00</maximum-critical-temperature>
          <minimum-critical-temperature>10.00</minimum-critical-temperature>
          <maximum-alert-temperature>65.00</maximum-alert-temperature>
          <minimum-alert-temperature>5.00</minimum-alert-temperature>
          <maximum-emergency-temperature>70.00</maximum-emergency-temperature>
          <minimum-emergency-temperature>0.00</minimum-emergency-temperature>
          <alarm-severity>indeterminate</alarm-severity>
          <alarm-threshold>0.00</alarm-threshold>
          <alarm-status>false</alarm-status>
          <sensor-index>0</sensor-index>
          <sensor-name>TEMPERATURE-SENSOR1</sensor-name>
          <interval>60</interval>
          <avg>29.98</avg>
          <max>30.00</max>
          <min>29.00</min>
          <instant>30.00</instant>
        </temperature>
      </state>
    </component>
    <component>
      <name>TEMPERATURE-SENSOR2</name>
      <state>
        <name>TEMPERATURE-SENSOR2</name>
        <temperature>
          <maximum-critical-temperature>60.00</maximum-critical-temperature>
          <minimum-critical-temperature>10.00</minimum-critical-temperature>
          <maximum-alert-temperature>65.00</maximum-alert-temperature>
          <minimum-alert-temperature>5.00</minimum-alert-temperature>
          <maximum-emergency-temperature>70.00</maximum-emergency-temperature>
          <minimum-emergency-temperature>0.00</minimum-emergency-temperature>
          <alarm-severity>indeterminate</alarm-severity>
          <alarm-threshold>0.00</alarm-threshold>
          <alarm-status>false</alarm-status>
          <sensor-index>1</sensor-index>
          <sensor-name>TEMPERATURE-SENSOR2</sensor-name>
          <interval>60</interval>
```

```
          <avg>28.98</avg>
          <max>29.00</max>
          <min>28.00</min>
          <instant>29.00</instant>
        </temperature>
      </state>
    </component>
    <component>
      <name>TEMPERATURE-SENSOR3</name>
      <state>
        <name>TEMPERATURE-SENSOR3</name>
        <temperature>
          <maximum-critical-temperature>60.00</maximum-critical-temperature>
          <minimum-critical-temperature>10.00</minimum-critical-temperature>
          <maximum-alert-temperature>65.00</maximum-alert-temperature>
          <minimum-alert-temperature>5.00</minimum-alert-temperature>
          <maximum-emergency-temperature>70.00</maximum-emergency-temperature>
          <minimum-emergency-temperature>0.00</minimum-emergency-temperature>
          <alarm-severity>indeterminate</alarm-severity>
          <alarm-threshold>0.00</alarm-threshold>
          <alarm-status>false</alarm-status>
          <sensor-index>2</sensor-index>
          <sensor-name>TEMPERATURE-SENSOR3</sensor-name>
          <interval>60</interval>
          <avg>28.07</avg>
          <max>29.00</max>
          <min>28.00</min>
          <instant>28.00</instant>
        </temperature>
      </state>
    </component>
    <component>
      <name>TEMPERATURE-BCM Chip</name>
      <state>
        <name>TEMPERATURE-BCM Chip</name>
        <temperature>
          <maximum-critical-temperature>75.00</maximum-critical-temperature>
          <minimum-critical-temperature>14.00</minimum-critical-temperature>
          <maximum-alert-temperature>80.00</maximum-alert-temperature>
          <minimum-alert-temperature>10.00</minimum-alert-temperature>
          <maximum-emergency-temperature>95.00</maximum-emergency-temperature>
          <minimum-emergency-temperature>0.00</minimum-emergency-temperature>
          <alarm-severity>indeterminate</alarm-severity>
          <alarm-threshold>0.00</alarm-threshold>
          <alarm-status>false</alarm-status>
          <sensor-index>3</sensor-index>
          <sensor-name>TEMPERATURE-BCM Chip</sensor-name>
          <interval>60</interval>
          <avg>48.49</avg>
          <max>49.60</max>
          <min>45.70</min>
          <instant>48.60</instant>
        </temperature>
      </state>
    </component>
  </components>
```

Show command

Here is Show command output that displays the hardware information for Temperature.

```
OcNOS#show hardware-information temperature

Board Temp Sensors Temperature in Degree C
------------------------------------------------------------------------------
-----------------------
SENSOR TYPE                          CURR  EMER  ALRT CRIT CRIT ALRT EMER   MIN-
TEMP  MAX-TEMP  AVG-TEMP
                                     TEMP  MIN   MIN  MIN  MAX  MAX  MAX
(Monitored since 00 hour,59 min)

------------------------------------------------------------------------------
-----------------------
SENSOR1                          30.00  0    5    10   60   65   70      29.00
30.00     29.98
SENSOR2                          29.00  0    5    10   60   65   70      28.00
29.00     28.98
SENSOR3                          28.00  0    5    10   60   65   70      28.00
29.00     28.07
BCM Chip                         48.10  0    10   14   75   80   95      45.70
49.60     48.48

BCM Chip Internal Temperature
----------------------------------------
TEMP MONITOR    CURRENT TEMP    PEAK TEMP
                (Degree C)      (Degree C)
----------------------------------------
1               48.10           49.10
2               48.10           50.10
3               42.70           45.20
4               47.70           50.60
```

Transceiver

This platform type displays transceiver presence status and the supported list of transceivers.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <state>
        <type>oc-platform-types:TRANSCEIVER</type>
      </state>
      <transceiver/>
    </component>
  </components>
</filter>
```

Get OpenConfig return

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
  <components xmlns="http://openconfig.net/yang/platform">
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-1</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-1</id>
        <name>SFP-1</name>
        <parent>PORT-xe1</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>1</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <date-code>150908</date-code>
          <serial-no>CN0V250M58V91KC </serial-no>
          <vendor-rev>C   </vendor-rev>
          <vendor-part>616740001       </vendor-part>
          <vendor>Amphenol        </vendor>
          <connector-type>ipi-oc-transport-types-
deviations:COPPER_PIGTAIL_CONNECTOR</connector-type>
          <form-factor>oc-opt-types:SFP_PLUS</form-factor>
          <present>PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-2</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-2</id>
        <name>SFP-2</name>
        <parent>PORT-xe2</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
```

```
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>2</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <date-code>151119</date-code>
          <serial-no>CN0V250M5BB2NMD </serial-no>
          <vendor-rev>C   </vendor-rev>
          <vendor-part>616740001       </vendor-part>
          <vendor>Amphenol        </vendor>
          <connector-type>ipi-oc-transport-types-
deviations:COPPER_PIGTAIL_CONNECTOR</connector-type>
          <form-factor>oc-opt-types:SFP_PLUS</form-factor>
          <present>PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-3</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-3</id>
        <name>SFP-3</name>
        <parent>PORT-xe3</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>3</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <date-code>151119</date-code>
          <serial-no>CN0V250M5BB2NEE </serial-no>
          <vendor-rev>C   </vendor-rev>
          <vendor-part>616740001       </vendor-part>
          <vendor>Amphenol        </vendor>
          <connector-type>ipi-oc-transport-types-
deviations:COPPER_PIGTAIL_CONNECTOR</connector-type>
          <form-factor>oc-opt-types:SFP_PLUS</form-factor>
```

```
          <present>PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-4</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-4</id>
        <name>SFP-4</name>
        <parent>PORT-xe4</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>4</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <date-code>150907</date-code>
          <serial-no>CN0V250M58V91K9 </serial-no>
          <vendor-rev>C   </vendor-rev>
          <vendor-part>616740001       </vendor-part>
          <vendor>Amphenol        </vendor>
          <connector-type>ipi-oc-transport-types-
deviations:COPPER_PIGTAIL_CONNECTOR</connector-type>
          <form-factor>oc-opt-types:SFP_PLUS</form-factor>
          <present>PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-5</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-5</id>
        <name>SFP-5</name>
        <parent>PORT-xe5</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
```

```
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>5</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-6</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-6</id>
        <name>SFP-6</name>
        <parent>PORT-xe6</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>6</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <date-code>150908</date-code>
          <serial-no>CN0V250M58V920E </serial-no>
          <vendor-rev>C   </vendor-rev>
          <vendor-part>616740001       </vendor-part>
          <vendor>Amphenol        </vendor>
          <connector-type>ipi-oc-transport-types-
deviations:COPPER_PIGTAIL_CONNECTOR</connector-type>
          <form-factor>oc-opt-types:SFP_PLUS</form-factor>
          <present>PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-7</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
```

```
        <id>SFP-7</id>
        <name>SFP-7</name>
        <parent>PORT-xe7</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>7</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-8</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-8</id>
        <name>SFP-8</name>
        <parent>PORT-xe8</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>8</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
```

```
      <name>SFP-9</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-9</id>
        <name>SFP-9</name>
        <parent>PORT-xe9</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>9</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-10</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-10</id>
        <name>SFP-10</name>
        <parent>PORT-xe10</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>10</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <date-code>161221</date-code>
          <serial-no>J11836008016    </serial-no>
          <vendor-rev>01  </vendor-rev>
```

```
          <vendor-part>ET5402-DAC-3M   </vendor-part>
          <vendor>Edgecore        </vendor>
          <connector-type>ipi-oc-transport-types-
deviations:COPPER_PIGTAIL_CONNECTOR</connector-type>
          <form-factor>oc-opt-types:SFP_PLUS</form-factor>
          <present>PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-11</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-11</id>
        <name>SFP-11</name>
        <parent>PORT-xe11</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>11</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <date-code>100101</date-code>
          <serial-no>NCI80T1328      </serial-no>
          <vendor-rev>1.0 </vendor-rev>
          <vendor-part>SFP-T           </vendor-part>
          <vendor>OEM             </vendor>
          <ethernet-pmd>ipi-oc-transport-types-deviations:ETH_1000BASE_T</
ethernet-pmd>
          <connector-type>oc-opt-types:LC_CONNECTOR</connector-type>
          <form-factor>oc-opt-types:SFP_PLUS</form-factor>
          <present>PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-12</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-12</id>
        <name>SFP-12</name>
        <parent>PORT-xe12</parent>
```

```
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>12</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-13</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-13</id>
        <name>SFP-13</name>
        <parent>PORT-xe13</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>13</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-14</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
```

```
        <id>SFP-14</id>
        <name>SFP-14</name>
        <parent>PORT-xe14</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>14</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-15</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-15</id>
        <name>SFP-15</name>
        <parent>PORT-xe15</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>15</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
```

```
      <name>SFP-16</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-16</id>
        <name>SFP-16</name>
        <parent>PORT-xe16</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>16</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-17</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-17</id>
        <name>SFP-17</name>
        <parent>PORT-xe17</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>17</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
```

```
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-18</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-18</id>
        <name>SFP-18</name>
        <parent>PORT-xe18</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>18</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-19</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-19</id>
        <name>SFP-19</name>
        <parent>PORT-xe19</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>19</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
```

```
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-20</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-20</id>
        <name>SFP-20</name>
        <parent>PORT-xe20</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>20</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-21</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-21</id>
        <name>SFP-21</name>
        <parent>PORT-xe21</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>21</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
```

```
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-22</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-22</id>
        <name>SFP-22</name>
        <parent>PORT-xe22</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>22</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-23</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-23</id>
        <name>SFP-23</name>
        <parent>PORT-xe23</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>23</location>
```

```
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-24</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-24</id>
        <name>SFP-24</name>
        <parent>PORT-xe24</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>24</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-25</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-25</id>
        <name>SFP-25</name>
        <parent>PORT-xe25</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
```

```
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>25</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-26</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-26</id>
        <name>SFP-26</name>
        <parent>PORT-xe26</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>26</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-27</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-27</id>
        <name>SFP-27</name>
        <parent>PORT-xe27</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
```

```
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>27</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-28</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-28</id>
        <name>SFP-28</name>
        <parent>PORT-xe28</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>28</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-29</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-29</id>
        <name>SFP-29</name>
        <parent>PORT-xe29</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
```

```
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>29</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-30</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-30</id>
        <name>SFP-30</name>
        <parent>PORT-xe30</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>30</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-31</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-31</id>
        <name>SFP-31</name>
        <parent>PORT-xe31</parent>
```

```
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>31</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-32</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-32</id>
        <name>SFP-32</name>
        <parent>PORT-xe32</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>32</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-33</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
```

```
        <id>SFP-33</id>
        <name>SFP-33</name>
        <parent>PORT-xe33</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>33</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-34</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-34</id>
        <name>SFP-34</name>
        <parent>PORT-xe34</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>34</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
```

```
      <name>SFP-35</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-35</id>
        <name>SFP-35</name>
        <parent>PORT-xe35</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>35</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-36</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-36</id>
        <name>SFP-36</name>
        <parent>PORT-xe36</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>36</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
```

```
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-37</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-37</id>
        <name>SFP-37</name>
        <parent>PORT-xe37</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>37</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-38</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-38</id>
        <name>SFP-38</name>
        <parent>PORT-xe38</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>38</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
```

```
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-39</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-39</id>
        <name>SFP-39</name>
        <parent>PORT-xe39</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>39</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-40</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-40</id>
        <name>SFP-40</name>
        <parent>PORT-xe40</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>40</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
```

```
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-41</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-41</id>
        <name>SFP-41</name>
        <parent>PORT-xe41</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>41</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-42</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-42</id>
        <name>SFP-42</name>
        <parent>PORT-xe42</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>42</location>
```

```
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-43</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-43</id>
        <name>SFP-43</name>
        <parent>PORT-xe43</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>43</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-44</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-44</id>
        <name>SFP-44</name>
        <parent>PORT-xe44</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
```

```
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>44</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-45</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-45</id>
        <name>SFP-45</name>
        <parent>PORT-xe45</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>45</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-46</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-46</id>
        <name>SFP-46</name>
        <parent>PORT-xe46</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
```

```
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>46</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-47</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-47</id>
        <name>SFP-47</name>
        <parent>PORT-xe47</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>47</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>SFP-48</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>SFP-48</id>
        <name>SFP-48</name>
        <parent>PORT-xe48</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
```

```
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>48</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>QSFP-49</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>QSFP-49</id>
        <name>QSFP-49</name>
        <parent>PORT-ce49</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>49</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <date-code>150727</date-code>
          <serial-no>CN05NP8R57Q7T6J </serial-no>
          <vendor-rev>C </vendor-rev>
          <vendor-part>616750001       </vendor-part>
          <vendor>Amphenol        </vendor>
          <ethernet-pmd>oc-opt-types:ETH_40GBASE_CR4</ethernet-pmd>
          <connector-type>ipi-oc-transport-types-
deviations:NO_SEPARABLE_CONNECTOR</connector-type>
          <form-factor>oc-opt-types:QSFP_PLUS</form-factor>
          <present>PRESENT</present>
        </state>
```

```
        <physical-channels xmlns="http://openconfig.net/yang/platform/
transceiver">
          <channel>
            <index>1</index>
            <state>
              <index>1</index>
              <laser-bias-current xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </laser-bias-current>
              <output-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </output-power>
              <input-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </input-power>
            </state>
          </channel>
          <channel>
            <index>2</index>
            <state>
              <index>2</index>
              <laser-bias-current xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </laser-bias-current>
              <output-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </output-power>
              <input-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </input-power>
            </state>
          </channel>
          <channel>
            <index>3</index>
            <state>
              <index>3</index>
              <laser-bias-current xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </laser-bias-current>
              <output-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </output-power>
              <input-power xmlns="http://openconfig.net/yang/platform/
transceiver">
```

```
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </input-power>
            </state>
          </channel>
          <channel>
            <index>4</index>
            <state>
              <index>4</index>
              <laser-bias-current xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </laser-bias-current>
              <output-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </output-power>
              <input-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </input-power>
            </state>
          </channel>
        </physical-channels>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>QSFP-50</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>QSFP-50</id>
        <name>QSFP-50</name>
        <parent>PORT-ce50</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>50</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
```

```
        <physical-channels xmlns="http://openconfig.net/yang/platform/
transceiver">
          <channel>
            <index>1</index>
          </channel>
          <channel>
            <index>2</index>
          </channel>
          <channel>
            <index>3</index>
          </channel>
          <channel>
            <index>4</index>
          </channel>
        </physical-channels>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>QSFP-51</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>QSFP-51</id>
        <name>QSFP-51</name>
        <parent>PORT-ce51</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>51</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <date-code>170628</date-code>
          <serial-no>J11836008038    </serial-no>
          <vendor-rev>01</vendor-rev>
          <vendor-part>ET7402-100DAC-1M</vendor-part>
          <vendor>Edgecore        </vendor>
          <ethernet-pmd>oc-opt-types:ETH_100GBASE_CR4</ethernet-pmd>
          <connector-type>ipi-oc-transport-types-
deviations:NO_SEPARABLE_CONNECTOR</connector-type>
          <form-factor>oc-opt-types:QSFP28</form-factor>
          <present>PRESENT</present>
        </state>
        <physical-channels xmlns="http://openconfig.net/yang/platform/
transceiver">
          <channel>
```

```
            <index>1</index>
            <state>
              <index>1</index>
              <laser-bias-current xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </laser-bias-current>
              <output-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </output-power>
              <input-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </input-power>
            </state>
          </channel>
          <channel>
            <index>2</index>
            <state>
              <index>2</index>
              <laser-bias-current xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </laser-bias-current>
              <output-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </output-power>
              <input-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </input-power>
            </state>
          </channel>
          <channel>
            <index>3</index>
            <state>
              <index>3</index>
              <laser-bias-current xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </laser-bias-current>
              <output-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </output-power>
              <input-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </input-power>
```

```
            </state>
          </channel>
          <channel>
            <index>4</index>
            <state>
              <index>4</index>
              <laser-bias-current xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </laser-bias-current>
              <output-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </output-power>
              <input-power xmlns="http://openconfig.net/yang/platform/
transceiver">
                <instant xmlns:oc-types="http://openconfig.net/yang/
openconfig-types">0.000</instant>
              </input-power>
            </state>
          </channel>
        </physical-channels>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>QSFP-52</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>QSFP-52</id>
        <name>QSFP-52</name>
        <parent>PORT-ce52</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>52</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
        <physical-channels xmlns="http://openconfig.net/yang/platform/
transceiver">
          <channel>
            <index>1</index>
```

```
          </channel>
          <channel>
            <index>2</index>
          </channel>
          <channel>
            <index>3</index>
          </channel>
          <channel>
            <index>4</index>
          </channel>
        </physical-channels>
      </transceiver>
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>QSFP-53</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>QSFP-53</id>
        <name>QSFP-53</name>
        <parent>PORT-ce53</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>53</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
        <physical-channels xmlns="http://openconfig.net/yang/platform/
transceiver">
          <channel>
            <index>1</index>
          </channel>
          <channel>
            <index>2</index>
          </channel>
          <channel>
            <index>3</index>
          </channel>
          <channel>
            <index>4</index>
          </channel>
        </physical-channels>
      </transceiver>
```

```
    </component>
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>QSFP-54</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>QSFP-54</id>
        <name>QSFP-54</name>
        <parent>PORT-ce54</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>54</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:TRANSCEIVER</type>
      </state>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <state xmlns:ipi-oc-transport-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-transport-types-deviations">
          <present>NOT_PRESENT</present>
        </state>
        <physical-channels xmlns="http://openconfig.net/yang/platform/
transceiver">
          <channel>
            <index>1</index>
          </channel>
          <channel>
            <index>2</index>
          </channel>
          <channel>
            <index>3</index>
          </channel>
          <channel>
            <index>4</index>
          </channel>
        </physical-channels>
      </transceiver>
    </component>
  </components>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
  <components xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
    <component>
      <name>SFP-1</name>
      <state>
        <name>SFP-1</name>
```

```
        <parent>PORT-xe1</parent>
        <product-name>NA</product-name>
        <oper-status>NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>1</location>
        <type>transceiver</type>
      </state>
      <transceiver>
        <state>
          <ddm-type>no</ddm-type>
          <vendor-manufacturing-date>150908  </vendor-manufacturing-date>
          <vendor-serial-number>CN0V250M58V91KC </vendor-serial-number>
          <minimum-signalling-rate>0</minimum-signalling-rate>
          <maximum-signalling-rate>0</maximum-signalling-rate>
          <nominal-signalling-rate>103</nominal-signalling-rate>
          <extended-check-code>0x4d</extended-check-code>
          <check-code>0xdf</check-code>
          <vendor-revision-number>C   </vendor-revision-number>
          <vendor-part-number>616740001       </vendor-part-number>
          <vendor-ieee-id>0x78 0xa7 0x14</vendor-ieee-id>
          <vendor-name>Amphenol        </vendor-name>
          <om4-link-length>1</om4-link-length>
          <om3-link-length>0</om3-link-length>
          <om2-link-length>0</om2-link-length>
          <om1-link-length>0</om1-link-length>
          <link-length-meter>0</link-length-meter>
          <link-length-kilometer>0</link-length-kilometer>
          <serial-encoding-algorithm>enc-unspecified</serial-encoding-
algorithm>
          <fiber-channel-transmission-media>twinaxial-pair</fiber-channel-
transmission-media>
          <fiber-channel-transmission-technology>electricalInter-Enclosure
electricalIntra-Enclosure</fiber-channel-transmission-technology>
          <fiber-channel-link-length>short</fiber-channel-link-length>
          <connector-type>copper-pigtail</connector-type>
          <transceiver-identifier>sfp-or-sfpplus-or-sfp28</transceiver-
identifier>
          <channel-count>1</channel-count>
          <type>sfp</type>
          <presence>Present</presence>
          <port-no>1</port-no>
        </state>
        <sfp>
          <state>
            <sfp-plus-cable-technology>passive</sfp-plus-cable-technology>
            <sfp-infiniband-compliance-code>ibc-1xcopperpassive</sfp-
infiniband-compliance-code>
            <fiber-channel-sfp-speed>fcs-800mbps fcs-400mbps fcs-200mbps fcs-
100mbps</fiber-channel-sfp-speed>
            <sfp-options-implemented>power-level1</sfp-options-implemented>
```

```
            <sfp-identifier>gbic-or-sfp-definedby-twowire-interfaceid-only</
sfp-identifier>
            <recieve-loss-status>NA</recieve-loss-status>
            <transmit-status>on</transmit-status>
          </state>
        </sfp>
      </transceiver>
    </component>
    <component>
      <name>SFP-2</name>
      <state>
        <name>SFP-2</name>
        <parent>PORT-xe2</parent>
        <product-name>NA</product-name>
        <oper-status>NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>2</location>
        <type>transceiver</type>
      </state>
      <transceiver>
        <state>
          <ddm-type>no</ddm-type>
          <vendor-manufacturing-date>151119  </vendor-manufacturing-date>
          <vendor-serial-number>CN0V250M5BB2NMD </vendor-serial-number>
          <minimum-signalling-rate>0</minimum-signalling-rate>
          <maximum-signalling-rate>0</maximum-signalling-rate>
          <nominal-signalling-rate>103</nominal-signalling-rate>
          <extended-check-code>0x57</extended-check-code>
          <check-code>0xdf</check-code>
          <vendor-revision-number>C   </vendor-revision-number>
          <vendor-part-number>616740001       </vendor-part-number>
          <vendor-ieee-id>0x78 0xa7 0x14</vendor-ieee-id>
          <vendor-name>Amphenol        </vendor-name>
          <om4-link-length>1</om4-link-length>
          <om3-link-length>0</om3-link-length>
          <om2-link-length>0</om2-link-length>
          <om1-link-length>0</om1-link-length>
          <link-length-meter>0</link-length-meter>
          <link-length-kilometer>0</link-length-kilometer>
          <serial-encoding-algorithm>enc-unspecified</serial-encoding-
algorithm>
          <fiber-channel-transmission-media>twinaxial-pair</fiber-channel-
transmission-media>
          <fiber-channel-transmission-technology>electricalInter-Enclosure
electricalIntra-Enclosure</fiber-channel-transmission-technology>
          <fiber-channel-link-length>short</fiber-channel-link-length>
          <connector-type>copper-pigtail</connector-type>
          <transceiver-identifier>sfp-or-sfpplus-or-sfp28</transceiver-
identifier>
          <channel-count>1</channel-count>
          <type>sfp</type>
```

```
          <presence>Present</presence>
          <port-no>2</port-no>
        </state>
        <sfp>
          <state>
            <sfp-plus-cable-technology>passive</sfp-plus-cable-technology>
            <sfp-infiniband-compliance-code>ibc-1xcopperpassive</sfp-
infiniband-compliance-code>
            <fiber-channel-sfp-speed>fcs-800mbps fcs-400mbps fcs-200mbps fcs-
100mbps</fiber-channel-sfp-speed>
            <sfp-options-implemented>power-level1</sfp-options-implemented>
            <sfp-identifier>gbic-or-sfp-definedby-twowire-interfaceid-only</
sfp-identifier>
            <recieve-loss-status>NA</recieve-loss-status>
            <transmit-status>on</transmit-status>
          </state>
        </sfp>
      </transceiver>
    </component>
    <component>
      <name>SFP-3</name>
      <state>
        <name>SFP-3</name>
        <parent>PORT-xe3</parent>
        <product-name>NA</product-name>
        <oper-status>NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>3</location>
        <type>transceiver</type>
      </state>
      <transceiver>
        <state>
          <ddm-type>no</ddm-type>
          <vendor-manufacturing-date>151119  </vendor-manufacturing-date>
          <vendor-serial-number>CN0V250M5BB2NEE </vendor-serial-number>
          <minimum-signalling-rate>0</minimum-signalling-rate>
          <maximum-signalling-rate>0</maximum-signalling-rate>
          <nominal-signalling-rate>103</nominal-signalling-rate>
          <extended-check-code>0x50</extended-check-code>
          <check-code>0xdf</check-code>
          <vendor-revision-number>C   </vendor-revision-number>
          <vendor-part-number>616740001       </vendor-part-number>
          <vendor-ieee-id>0x78 0xa7 0x14</vendor-ieee-id>
          <vendor-name>Amphenol        </vendor-name>
          <om4-link-length>1</om4-link-length>
          <om3-link-length>0</om3-link-length>
          <om2-link-length>0</om2-link-length>
          <om1-link-length>0</om1-link-length>
          <link-length-meter>0</link-length-meter>
          <link-length-kilometer>0</link-length-kilometer>
```

```
          <serial-encoding-algorithm>enc-unspecified</serial-encoding-
algorithm>
          <fiber-channel-transmission-media>twinaxial-pair</fiber-channel-
transmission-media>
          <fiber-channel-transmission-technology>electricalInter-Enclosure
electricalIntra-Enclosure</fiber-channel-transmission-technology>
          <fiber-channel-link-length>short</fiber-channel-link-length>
          <connector-type>copper-pigtail</connector-type>
          <transceiver-identifier>sfp-or-sfpplus-or-sfp28</transceiver-
identifier>
          <channel-count>1</channel-count>
          <type>sfp</type>
          <presence>Present</presence>
          <port-no>3</port-no>
        </state>
        <sfp>
          <state>
            <sfp-plus-cable-technology>passive</sfp-plus-cable-technology>
            <sfp-infiniband-compliance-code>ibc-1xcopperpassive</sfp-
infiniband-compliance-code>
            <fiber-channel-sfp-speed>fcs-800mbps fcs-400mbps fcs-200mbps fcs-
100mbps</fiber-channel-sfp-speed>
            <sfp-options-implemented>power-level1</sfp-options-implemented>
            <sfp-identifier>gbic-or-sfp-definedby-twowire-interfaceid-only</
sfp-identifier>
            <recieve-loss-status>NA</recieve-loss-status>
            <transmit-status>on</transmit-status>
          </state>
        </sfp>
      </transceiver>
    </component>
    <component>
      <name>SFP-4</name>
      <state>
        <name>SFP-4</name>
        <parent>PORT-xe4</parent>
        <product-name>NA</product-name>
        <oper-status>NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>4</location>
        <type>transceiver</type>
      </state>
      <transceiver>
        <state>
          <ddm-type>no</ddm-type>
          <vendor-manufacturing-date>150907  </vendor-manufacturing-date>
          <vendor-serial-number>CN0V250M58V91K9 </vendor-serial-number>
          <minimum-signalling-rate>0</minimum-signalling-rate>
          <maximum-signalling-rate>0</maximum-signalling-rate>
          <nominal-signalling-rate>103</nominal-signalling-rate>
          <extended-check-code>0x42</extended-check-code>
```

```
          <check-code>0xdf</check-code>
          <vendor-revision-number>C   </vendor-revision-number>
          <vendor-part-number>616740001       </vendor-part-number>
          <vendor-ieee-id>0x78 0xa7 0x14</vendor-ieee-id>
          <vendor-name>Amphenol        </vendor-name>
          <om4-link-length>1</om4-link-length>
          <om3-link-length>0</om3-link-length>
          <om2-link-length>0</om2-link-length>
          <om1-link-length>0</om1-link-length>
          <link-length-meter>0</link-length-meter>
          <link-length-kilometer>0</link-length-kilometer>
          <serial-encoding-algorithm>enc-unspecified</serial-encoding-
algorithm>
          <fiber-channel-transmission-media>twinaxial-pair</fiber-channel-
transmission-media>
          <fiber-channel-transmission-technology>electricalInter-Enclosure
electricalIntra-Enclosure</fiber-channel-transmission-technology>
          <fiber-channel-link-length>short</fiber-channel-link-length>
          <connector-type>copper-pigtail</connector-type>
          <transceiver-identifier>sfp-or-sfpplus-or-sfp28</transceiver-
identifier>
          <channel-count>1</channel-count>
          <type>sfp</type>
          <presence>Present</presence>
          <port-no>4</port-no>
        </state>
        <sfp>
          <state>
            <sfp-plus-cable-technology>passive</sfp-plus-cable-technology>
            <sfp-infiniband-compliance-code>ibc-1xcopperpassive</sfp-
infiniband-compliance-code>
            <fiber-channel-sfp-speed>fcs-800mbps fcs-400mbps fcs-200mbps fcs-
100mbps</fiber-channel-sfp-speed>
            <sfp-options-implemented>power-level1</sfp-options-implemented>
            <sfp-identifier>gbic-or-sfp-definedby-twowire-interfaceid-only</
sfp-identifier>
            <recieve-loss-status>NA</recieve-loss-status>
            <transmit-status>on</transmit-status>
          </state>
        </sfp>
      </transceiver>
    </component>
    <component>
      <name>SFP-5</name>
      <state>
        <name>SFP-5</name>
        <parent>PORT-xe5</parent>
        <product-name>NA</product-name>
        <oper-status>NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>5</location>
```

```
          <type>transceiver</type>
        </state>
        <transceiver>
          <state>
            <channel-count>1</channel-count>
            <type>sfp</type>
            <presence>Not-Present</presence>
            <port-no>5</port-no>
          </state>
          <sfp>
            <state>
              <recieve-loss-status>NA</recieve-loss-status>
              <transmit-status>off</transmit-status>
            </state>
          </sfp>
        </transceiver>
      </component>
      <component>
        <name>SFP-6</name>
        <state>
          <name>SFP-6</name>
          <parent>PORT-xe6</parent>
          <product-name>NA</product-name>
          <oper-status>NA</oper-status>
          <removable>true</removable>
          <part-no>NA</part-no>
          <serial-no>NA</serial-no>
          <software-version>NA</software-version>
          <firmware-version>NA</firmware-version>
          <hardware-version>NA</hardware-version>
          <description>NA</description>
          <mfg-name>NA</mfg-name>
          <location>6</location>
          <type>transceiver</type>
        </state>
        <transceiver>
          <state>
            <ddm-type>no</ddm-type>
            <vendor-manufacturing-date>150908  </vendor-manufacturing-date>
            <vendor-serial-number>CN0V250M58V920E </vendor-serial-number>
            <minimum-signalling-rate>0</minimum-signalling-rate>
            <maximum-signalling-rate>0</maximum-signalling-rate>
            <nominal-signalling-rate>103</nominal-signalling-rate>
            <extended-check-code>0x35</extended-check-code>
            <check-code>0xdf</check-code>
            <vendor-revision-number>C   </vendor-revision-number>
            <vendor-part-number>616740001       </vendor-part-number>
            <vendor-ieee-id>0x78 0xa7 0x14</vendor-ieee-id>
            <vendor-name>Amphenol        </vendor-name>
            <om4-link-length>1</om4-link-length>
            <om3-link-length>0</om3-link-length>
            <om2-link-length>0</om2-link-length>
            <om1-link-length>0</om1-link-length>
            <link-length-meter>0</link-length-meter>
            <link-length-kilometer>0</link-length-kilometer>
            <serial-encoding-algorithm>enc-unspecified</serial-encoding-
algorithm>
```

```
          <fiber-channel-transmission-media>twinaxial-pair</fiber-channel-
transmission-media>
          <fiber-channel-transmission-technology>electricalInter-Enclosure
electricalIntra-Enclosure</fiber-channel-transmission-technology>
          <fiber-channel-link-length>short</fiber-channel-link-length>
          <connector-type>copper-pigtail</connector-type>
          <transceiver-identifier>sfp-or-sfpplus-or-sfp28</transceiver-
identifier>
          <channel-count>1</channel-count>
          <type>sfp</type>
          <presence>Present</presence>
          <port-no>6</port-no>
        </state>
        <sfp>
          <state>
            <sfp-plus-cable-technology>passive</sfp-plus-cable-technology>
            <sfp-infiniband-compliance-code>ibc-1xcopperpassive</sfp-
infiniband-compliance-code>
            <fiber-channel-sfp-speed>fcs-800mbps fcs-400mbps fcs-200mbps fcs-
100mbps</fiber-channel-sfp-speed>
            <sfp-options-implemented>power-level1</sfp-options-implemented>
            <sfp-identifier>gbic-or-sfp-definedby-twowire-interfaceid-only</
sfp-identifier>
            <recieve-loss-status>NA</recieve-loss-status>
            <transmit-status>on</transmit-status>
          </state>
        </sfp>
      </transceiver>
    </component>
    <component>
      <name>SFP-7</name>
      <state>
        <name>SFP-7</name>
        <parent>PORT-xe7</parent>
        <product-name>NA</product-name>
        <oper-status>NA</oper-status>
        <removable>true</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>7</location>
        <type>transceiver</type>
      </state>
      <transceiver>
        <state>
          <channel-count>1</channel-count>
          <type>sfp</type>
          <presence>Not-Present</presence>
          <port-no>7</port-no>
        </state>
        <sfp>
          <state>
            <recieve-loss-status>NA</recieve-loss-status>
            <transmit-status>off</transmit-status>
```

```
      </state>
    </sfp>
  </transceiver>
</component>
<component>
  <name>SFP-8</name>
  <state>
    <name>SFP-8</name>
    <parent>PORT-xe8</parent>
    <product-name>NA</product-name>
    <oper-status>NA</oper-status>
    <removable>true</removable>
    <part-no>NA</part-no>
    <serial-no>NA</serial-no>
    <software-version>NA</software-version>
    <firmware-version>NA</firmware-version>
    <hardware-version>NA</hardware-version>
    <description>NA</description>
    <mfg-name>NA</mfg-name>
    <location>8</location>
    <type>transceiver</type>
  </state>
  <transceiver>
    <state>
      <channel-count>1</channel-count>
      <type>sfp</type>
      <presence>Not-Present</presence>
      <port-no>8</port-no>
    </state>
    <sfp>
      <state>
        <recieve-loss-status>NA</recieve-loss-status>
        <transmit-status>off</transmit-status>
      </state>
    </sfp>
  </transceiver>
</component>
<component>
  <name>SFP-9</name>
  <state>
    <name>SFP-9</name>
    <parent>PORT-xe9</parent>
    <product-name>NA</product-name>
    <oper-status>NA</oper-status>
    <removable>true</removable>
    <part-no>NA</part-no>
    <serial-no>NA</serial-no>
    <software-version>NA</software-version>
    <firmware-version>NA</firmware-version>
    <hardware-version>NA</hardware-version>
    <description>NA</description>
    <mfg-name>NA</mfg-name>
    <location>9</location>
    <type>transceiver</type>
  </state>
  <transceiver>
    <state>
```

```
            <channel-count>1</channel-count>
            <type>sfp</type>
            <presence>Not-Present</presence>
            <port-no>9</port-no>
          </state>
          <sfp>
            <state>
              <recieve-loss-status>NA</recieve-loss-status>
              <transmit-status>off</transmit-status>
            </state>
          </sfp>
        </transceiver>
      </component>
      <component>
        <name>SFP-10</name>
        <state>
          <name>SFP-10</name>
          <parent>PORT-xe10</parent>
          <product-name>NA</product-name>
          <oper-status>NA</oper-status>
          <removable>true</removable>
          <part-no>NA</part-no>
          <serial-no>NA</serial-no>
          <software-version>NA</software-version>
          <firmware-version>NA</firmware-version>
          <hardware-version>NA</hardware-version>
          <description>NA</description>
          <mfg-name>NA</mfg-name>
          <location>10</location>
          <type>transceiver</type>
        </state>
        <transceiver>
          <state>
            <ddm-type>no</ddm-type>
            <vendor-manufacturing-date>161221  </vendor-manufacturing-date>
            <vendor-serial-number>J11836008016    </vendor-serial-number>
            <minimum-signalling-rate>0</minimum-signalling-rate>
            <maximum-signalling-rate>0</maximum-signalling-rate>
            <nominal-signalling-rate>103</nominal-signalling-rate>
            <extended-check-code>0x69</extended-check-code>
            <check-code>0x6d</check-code>
            <vendor-revision-number>01  </vendor-revision-number>
            <vendor-part-number>ET5402-DAC-3M   </vendor-part-number>
            <vendor-ieee-id>0x70 0x72 0xcf</vendor-ieee-id>
            <vendor-name>Edgecore        </vendor-name>
            <om4-link-length>3</om4-link-length>
            <om3-link-length>0</om3-link-length>
            <om2-link-length>0</om2-link-length>
            <om1-link-length>0</om1-link-length>
            <link-length-meter>0</link-length-meter>
            <link-length-kilometer>0</link-length-kilometer>
            <serial-encoding-algorithm>enc-unspecified</serial-encoding-
algorithm>
            <connector-type>copper-pigtail</connector-type>
            <transceiver-identifier>sfp-or-sfpplus-or-sfp28</transceiver-
identifier>
            <channel-count>1</channel-count>
```

```
          <type>sfp</type>
          <presence>Present</presence>
          <port-no>10</port-no>
        </state>
        <sfp>
          <state>
            <sfp-plus-cable-technology>passive</sfp-plus-cable-technology>
            <sfp-options-implemented>power-level1</sfp-options-implemented>
            <sfp-identifier>gbic-or-sfp-definedby-twowire-interfaceid-only</
sfp-identifier>
            <recieve-loss-status>NA</recieve-loss-status>
            <transmit-status>on</transmit-status>
          </state>
        </sfp>
      </transceiver>
    </component>
    <component>
      <name>SFP-11</name>
      <state>
        <name>SFP-11</name>
        <parent>PORT-xe11</parent>
        <product-name>NA</product-name>
        <oper-status>NA</oper-status>
        <removable>true</removable>
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      <parent>PORT-xe31</parent>
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          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
    <name>SFP-32</name>
    <state>
      <name>SFP-32</name>
      <parent>PORT-xe32</parent>
      <product-name>NA</product-name>
```

```
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>32</location>
      <type>transceiver</type>
    </state>
    <transceiver>
      <state>
        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>32</port-no>
      </state>
      <sfp>
        <state>
          <recieve-loss-status>NA</recieve-loss-status>
          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
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    <state>
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      <parent>PORT-xe33</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
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      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
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    </state>
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      <state>
        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>33</port-no>
      </state>
      <sfp>
        <state>
          <recieve-loss-status>NA</recieve-loss-status>
          <transmit-status>off</transmit-status>
        </state>
```

```
      </sfp>
    </transceiver>
  </component>
  <component>
    <name>SFP-34</name>
    <state>
      <name>SFP-34</name>
      <parent>PORT-xe34</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>34</location>
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    </state>
    <transceiver>
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        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>34</port-no>
      </state>
      <sfp>
        <state>
          <recieve-loss-status>NA</recieve-loss-status>
          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
    <name>SFP-35</name>
    <state>
      <name>SFP-35</name>
      <parent>PORT-xe35</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
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      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>35</location>
      <type>transceiver</type>
    </state>
    <transceiver>
      <state>
        <channel-count>1</channel-count>
```

```
      <type>sfp</type>
      <presence>Not-Present</presence>
      <port-no>35</port-no>
    </state>
    <sfp>
      <state>
        <recieve-loss-status>NA</recieve-loss-status>
        <transmit-status>off</transmit-status>
      </state>
    </sfp>
  </transceiver>
</component>
<component>
  <name>SFP-36</name>
  <state>
    <name>SFP-36</name>
    <parent>PORT-xe36</parent>
    <product-name>NA</product-name>
    <oper-status>NA</oper-status>
    <removable>true</removable>
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    <serial-no>NA</serial-no>
    <software-version>NA</software-version>
    <firmware-version>NA</firmware-version>
    <hardware-version>NA</hardware-version>
    <description>NA</description>
    <mfg-name>NA</mfg-name>
    <location>36</location>
    <type>transceiver</type>
  </state>
  <transceiver>
    <state>
      <channel-count>1</channel-count>
      <type>sfp</type>
      <presence>Not-Present</presence>
      <port-no>36</port-no>
    </state>
    <sfp>
      <state>
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        <transmit-status>off</transmit-status>
      </state>
    </sfp>
  </transceiver>
</component>
<component>
  <name>SFP-37</name>
  <state>
    <name>SFP-37</name>
    <parent>PORT-xe37</parent>
    <product-name>NA</product-name>
    <oper-status>NA</oper-status>
    <removable>true</removable>
    <part-no>NA</part-no>
    <serial-no>NA</serial-no>
    <software-version>NA</software-version>
    <firmware-version>NA</firmware-version>
```

```
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
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        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>37</port-no>
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        <state>
          <recieve-loss-status>NA</recieve-loss-status>
          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
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    <state>
      <name>SFP-38</name>
      <parent>PORT-xe38</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>38</location>
      <type>transceiver</type>
    </state>
    <transceiver>
      <state>
        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>38</port-no>
      </state>
      <sfp>
        <state>
          <recieve-loss-status>NA</recieve-loss-status>
          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
    <name>SFP-39</name>
    <state>
```

```
      <name>SFP-39</name>
      <parent>PORT-xe39</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
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      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>39</location>
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    <transceiver>
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        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>39</port-no>
      </state>
      <sfp>
        <state>
          <recieve-loss-status>NA</recieve-loss-status>
          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
    <name>SFP-40</name>
    <state>
      <name>SFP-40</name>
      <parent>PORT-xe40</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>40</location>
      <type>transceiver</type>
    </state>
    <transceiver>
      <state>
        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>40</port-no>
      </state>
      <sfp>
        <state>
```

```
        <recieve-loss-status>NA</recieve-loss-status>
        <transmit-status>off</transmit-status>
      </state>
    </sfp>
  </transceiver>
</component>
<component>
  <name>SFP-41</name>
  <state>
    <name>SFP-41</name>
    <parent>PORT-xe41</parent>
    <product-name>NA</product-name>
    <oper-status>NA</oper-status>
    <removable>true</removable>
    <part-no>NA</part-no>
    <serial-no>NA</serial-no>
    <software-version>NA</software-version>
    <firmware-version>NA</firmware-version>
    <hardware-version>NA</hardware-version>
    <description>NA</description>
    <mfg-name>NA</mfg-name>
    <location>41</location>
    <type>transceiver</type>
  </state>
  <transceiver>
    <state>
      <channel-count>1</channel-count>
      <type>sfp</type>
      <presence>Not-Present</presence>
      <port-no>41</port-no>
    </state>
    <sfp>
      <state>
        <recieve-loss-status>NA</recieve-loss-status>
        <transmit-status>off</transmit-status>
      </state>
    </sfp>
  </transceiver>
</component>
<component>
  <name>SFP-42</name>
  <state>
    <name>SFP-42</name>
    <parent>PORT-xe42</parent>
    <product-name>NA</product-name>
    <oper-status>NA</oper-status>
    <removable>true</removable>
    <part-no>NA</part-no>
    <serial-no>NA</serial-no>
    <software-version>NA</software-version>
    <firmware-version>NA</firmware-version>
    <hardware-version>NA</hardware-version>
    <description>NA</description>
    <mfg-name>NA</mfg-name>
    <location>42</location>
    <type>transceiver</type>
  </state>
```

```
    <transceiver>
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        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>42</port-no>
      </state>
      <sfp>
        <state>
          <recieve-loss-status>NA</recieve-loss-status>
          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
    <name>SFP-43</name>
    <state>
      <name>SFP-43</name>
      <parent>PORT-xe43</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>43</location>
      <type>transceiver</type>
    </state>
    <transceiver>
      <state>
        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>43</port-no>
      </state>
      <sfp>
        <state>
          <recieve-loss-status>NA</recieve-loss-status>
          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
    <name>SFP-44</name>
    <state>
      <name>SFP-44</name>
      <parent>PORT-xe44</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
```

```
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>44</location>
      <type>transceiver</type>
    </state>
    <transceiver>
      <state>
        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>44</port-no>
      </state>
      <sfp>
        <state>
          <recieve-loss-status>NA</recieve-loss-status>
          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
    <name>SFP-45</name>
    <state>
      <name>SFP-45</name>
      <parent>PORT-xe45</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>45</location>
      <type>transceiver</type>
    </state>
    <transceiver>
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        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>45</port-no>
      </state>
      <sfp>
        <state>
          <recieve-loss-status>NA</recieve-loss-status>
          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
```

```
<component>
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  <state>
    <name>SFP-46</name>
    <parent>PORT-xe46</parent>
    <product-name>NA</product-name>
    <oper-status>NA</oper-status>
    <removable>true</removable>
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    <serial-no>NA</serial-no>
    <software-version>NA</software-version>
    <firmware-version>NA</firmware-version>
    <hardware-version>NA</hardware-version>
    <description>NA</description>
    <mfg-name>NA</mfg-name>
    <location>46</location>
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  <transceiver>
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      <presence>Not-Present</presence>
      <port-no>46</port-no>
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    <sfp>
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        <transmit-status>off</transmit-status>
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    </sfp>
  </transceiver>
</component>
<component>
  <name>SFP-47</name>
  <state>
    <name>SFP-47</name>
    <parent>PORT-xe47</parent>
    <product-name>NA</product-name>
    <oper-status>NA</oper-status>
    <removable>true</removable>
    <part-no>NA</part-no>
    <serial-no>NA</serial-no>
    <software-version>NA</software-version>
    <firmware-version>NA</firmware-version>
    <hardware-version>NA</hardware-version>
    <description>NA</description>
    <mfg-name>NA</mfg-name>
    <location>47</location>
    <type>transceiver</type>
  </state>
  <transceiver>
    <state>
      <channel-count>1</channel-count>
      <type>sfp</type>
      <presence>Not-Present</presence>
      <port-no>47</port-no>
```

```
      </state>
      <sfp>
        <state>
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          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
    <name>SFP-48</name>
    <state>
      <name>SFP-48</name>
      <parent>PORT-xe48</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>48</location>
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    </state>
    <transceiver>
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        <channel-count>1</channel-count>
        <type>sfp</type>
        <presence>Not-Present</presence>
        <port-no>48</port-no>
      </state>
      <sfp>
        <state>
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          <transmit-status>off</transmit-status>
        </state>
      </sfp>
    </transceiver>
  </component>
  <component>
    <name>QSFP-49</name>
    <state>
      <name>QSFP-49</name>
      <parent>PORT-ce49</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
```

```
        <location>49</location>
        <type>transceiver</type>
      </state>
      <transceiver>
        <state>
          <maximum-case-temperature>70.00</maximum-case-temperature>
          <ddm-type>no</ddm-type>
          <vendor-manufacturing-date>150727  </vendor-manufacturing-date>
          <vendor-serial-number>CN05NP8R57Q7T6J </vendor-serial-number>
          <nominal-signalling-rate>103</nominal-signalling-rate>
          <extended-check-code>0x7c</extended-check-code>
          <check-code>0x98</check-code>
          <vendor-revision-number>C </vendor-revision-number>
          <vendor-part-number>616750001       </vendor-part-number>
          <vendor-ieee-id>0x78 0xa7 0x14</vendor-ieee-id>
          <vendor-name>Amphenol        </vendor-name>
          <om4-link-length>1</om4-link-length>
          <om3-link-length>0</om3-link-length>
          <om2-link-length>0</om2-link-length>
          <om1-link-length>0</om1-link-length>
          <link-length-kilometer>0</link-length-kilometer>
          <serial-encoding-algorithm>enc-unspecified</serial-encoding-
algorithm>
          <fiber-channel-transmission-media>twinaxial-pair</fiber-channel-
transmission-media>
          <fiber-channel-transmission-technology>electricalInter-Enclosure
electricalIntra-Enclosure</fiber-channel-transmission-technology>
          <fiber-channel-link-length>short</fiber-channel-link-length>
          <ethernet-compliance-code>ec-40gbase-cr4</ethernet-compliance-code>
          <connector-type>no-separable-connector</connector-type>
          <transceiver-identifier>qsfpplus-or-later</transceiver-identifier>
          <channel-count>4</channel-count>
          <type>qsfp</type>
          <presence>Present</presence>
          <port-no>49</port-no>
        </state>
        <qsfp>
          <state>
            <qsfp-options-implemented>tx-cdr-on-or-off-fixed rx-cdr-on-or-off-
fixed rateselect-fixed</qsfp-options-implemented>
            <fiber-channel-qsfp-speed>fcs-800mbps fcs-400mbps fcs-200mbps fcs-
100mbps</fiber-channel-qsfp-speed>
            <qsfp-identifier>powerclass1-1dot5wmax</qsfp-identifier>
            <lane4-recieve-loss>off</lane4-recieve-loss>
            <lane4-transmission-loss>off</lane4-transmission-loss>
            <lane4-transmission>on</lane4-transmission>
            <lane3-recieve-loss>off</lane3-recieve-loss>
            <lane3-transmission-loss>off</lane3-transmission-loss>
            <lane3-transmission>on</lane3-transmission>
            <lane2-recieve-loss>off</lane2-recieve-loss>
            <lane2-transmission-loss>off</lane2-transmission-loss>
            <lane2-transmission>on</lane2-transmission>
            <lane1-recieve-loss>off</lane1-recieve-loss>
            <lane1-transmission-loss>off</lane1-transmission-loss>
            <lane1-transmission>on</lane1-transmission>
            <power>High</power>
            <reset-status>Normal</reset-status>
          </state>
```

```
      </qsfp>
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        <channel>
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          <state>
            <index>1</index>
            <laser-bias-current>0.000</laser-bias-current>
            <output-power>0.000</output-power>
            <input-power>0.000</input-power>
          </state>
        </channel>
        <channel>
          <index>2</index>
          <state>
            <index>2</index>
            <laser-bias-current>0.000</laser-bias-current>
            <output-power>0.000</output-power>
            <input-power>0.000</input-power>
          </state>
        </channel>
        <channel>
          <index>3</index>
          <state>
            <index>3</index>
            <laser-bias-current>0.000</laser-bias-current>
            <output-power>0.000</output-power>
            <input-power>0.000</input-power>
          </state>
        </channel>
        <channel>
          <index>4</index>
          <state>
            <index>4</index>
            <laser-bias-current>0.000</laser-bias-current>
            <output-power>0.000</output-power>
            <input-power>0.000</input-power>
          </state>
        </channel>
      </channels>
    </transceiver>
  </component>
  <component>
    <name>QSFP-50</name>
    <state>
      <name>QSFP-50</name>
      <parent>PORT-ce50</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>50</location>
```

```
      <type>transceiver</type>
    </state>
    <transceiver>
      <state>
        <channel-count>4</channel-count>
        <type>qsfp</type>
        <presence>Not-Present</presence>
        <port-no>50</port-no>
      </state>
      <qsfp>
        <state>
          <lane4-recieve-loss>off</lane4-recieve-loss>
          <lane4-transmission-loss>off</lane4-transmission-loss>
          <lane4-transmission>off</lane4-transmission>
          <lane3-recieve-loss>off</lane3-recieve-loss>
          <lane3-transmission-loss>off</lane3-transmission-loss>
          <lane3-transmission>off</lane3-transmission>
          <lane2-recieve-loss>off</lane2-recieve-loss>
          <lane2-transmission-loss>off</lane2-transmission-loss>
          <lane2-transmission>off</lane2-transmission>
          <lane1-recieve-loss>off</lane1-recieve-loss>
          <lane1-transmission-loss>off</lane1-transmission-loss>
          <lane1-transmission>off</lane1-transmission>
          <power>Low</power>
          <reset-status>Reset</reset-status>
        </state>
      </qsfp>
      <channels>
        <channel>
          <index>1</index>
        </channel>
        <channel>
          <index>2</index>
        </channel>
        <channel>
          <index>3</index>
        </channel>
        <channel>
          <index>4</index>
        </channel>
      </channels>
    </transceiver>
  </component>
  <component>
    <name>QSFP-51</name>
    <state>
      <name>QSFP-51</name>
      <parent>PORT-ce51</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
```

```
        <mfg-name>NA</mfg-name>
        <location>51</location>
        <type>transceiver</type>
      </state>
      <transceiver>
        <state>
          <maximum-case-temperature>70.00</maximum-case-temperature>
          <ddm-type>no</ddm-type>
          <vendor-manufacturing-date>170628  </vendor-manufacturing-date>
          <vendor-serial-number>J11836008038    </vendor-serial-number>
          <nominal-signalling-rate>255</nominal-signalling-rate>
          <extended-check-code>0x83</extended-check-code>
          <check-code>0x90</check-code>
          <vendor-revision-number>01</vendor-revision-number>
          <vendor-part-number>ET7402-100DAC-1M</vendor-part-number>
          <vendor-ieee-id>0x70 0x72 0xcf</vendor-ieee-id>
          <vendor-name>Edgecore        </vendor-name>
          <om4-link-length>1</om4-link-length>
          <om3-link-length>0</om3-link-length>
          <om2-link-length>0</om2-link-length>
          <om1-link-length>0</om1-link-length>
          <link-length-kilometer>0</link-length-kilometer>
          <serial-encoding-algorithm>enc-unspecified</serial-encoding-
algorithm>
          <extended-ethernet-compliance-code>eec-100gbase-cr4-or-25gbase-crca-
l</extended-ethernet-compliance-code>
          <connector-type>no-separable-connector</connector-type>
          <transceiver-identifier>qsfp28-or-later</transceiver-identifier>
          <channel-count>4</channel-count>
          <type>qsfp</type>
          <presence>Present</presence>
          <port-no>51</port-no>
        </state>
        <qsfp>
          <state>
            <qsfp-options-implemented>tx-cdr-on-or-off-fixed rx-cdr-on-or-off-
fixed rateselect-fixed</qsfp-options-implemented>
            <qsfp-identifier>powerclass1-1dot5wmax</qsfp-identifier>
            <lane4-recieve-loss>off</lane4-recieve-loss>
            <lane4-transmission-loss>off</lane4-transmission-loss>
            <lane4-transmission>on</lane4-transmission>
            <lane3-recieve-loss>off</lane3-recieve-loss>
            <lane3-transmission-loss>off</lane3-transmission-loss>
            <lane3-transmission>on</lane3-transmission>
            <lane2-recieve-loss>off</lane2-recieve-loss>
            <lane2-transmission-loss>off</lane2-transmission-loss>
            <lane2-transmission>on</lane2-transmission>
            <lane1-recieve-loss>off</lane1-recieve-loss>
            <lane1-transmission-loss>off</lane1-transmission-loss>
            <lane1-transmission>on</lane1-transmission>
            <power>High</power>
            <reset-status>Normal</reset-status>
          </state>
        </qsfp>
        <channels>
          <channel>
            <index>1</index>
```

```
          <state>
            <index>1</index>
            <laser-bias-current>0.000</laser-bias-current>
            <output-power>0.000</output-power>
            <input-power>0.000</input-power>
          </state>
        </channel>
        <channel>
          <index>2</index>
          <state>
            <index>2</index>
            <laser-bias-current>0.000</laser-bias-current>
            <output-power>0.000</output-power>
            <input-power>0.000</input-power>
          </state>
        </channel>
        <channel>
          <index>3</index>
          <state>
            <index>3</index>
            <laser-bias-current>0.000</laser-bias-current>
            <output-power>0.000</output-power>
            <input-power>0.000</input-power>
          </state>
        </channel>
        <channel>
          <index>4</index>
          <state>
            <index>4</index>
            <laser-bias-current>0.000</laser-bias-current>
            <output-power>0.000</output-power>
            <input-power>0.000</input-power>
          </state>
        </channel>
      </channels>
    </transceiver>
  </component>
  <component>
    <name>QSFP-52</name>
    <state>
      <name>QSFP-52</name>
      <parent>PORT-ce52</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>52</location>
      <type>transceiver</type>
    </state>
    <transceiver>
      <state>
```

```
        <channel-count>4</channel-count>
        <type>qsfp</type>
        <presence>Not-Present</presence>
        <port-no>52</port-no>
      </state>
      <qsfp>
        <state>
          <lane4-recieve-loss>off</lane4-recieve-loss>
          <lane4-transmission-loss>off</lane4-transmission-loss>
          <lane4-transmission>off</lane4-transmission>
          <lane3-recieve-loss>off</lane3-recieve-loss>
          <lane3-transmission-loss>off</lane3-transmission-loss>
          <lane3-transmission>off</lane3-transmission>
          <lane2-recieve-loss>off</lane2-recieve-loss>
          <lane2-transmission-loss>off</lane2-transmission-loss>
          <lane2-transmission>off</lane2-transmission>
          <lane1-recieve-loss>off</lane1-recieve-loss>
          <lane1-transmission-loss>off</lane1-transmission-loss>
          <lane1-transmission>off</lane1-transmission>
          <power>Low</power>
          <reset-status>Reset</reset-status>
        </state>
      </qsfp>
      <channels>
        <channel>
          <index>1</index>
        </channel>
        <channel>
          <index>2</index>
        </channel>
        <channel>
          <index>3</index>
        </channel>
        <channel>
          <index>4</index>
        </channel>
      </channels>
    </transceiver>
  </component>
  <component>
    <name>QSFP-53</name>
    <state>
      <name>QSFP-53</name>
      <parent>PORT-ce53</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>53</location>
      <type>transceiver</type>
    </state>
```

```
    <transceiver>
      <state>
        <channel-count>4</channel-count>
        <type>qsfp</type>
        <presence>Not-Present</presence>
        <port-no>53</port-no>
      </state>
      <qsfp>
        <state>
          <lane4-recieve-loss>off</lane4-recieve-loss>
          <lane4-transmission-loss>off</lane4-transmission-loss>
          <lane4-transmission>off</lane4-transmission>
          <lane3-recieve-loss>off</lane3-recieve-loss>
          <lane3-transmission-loss>off</lane3-transmission-loss>
          <lane3-transmission>off</lane3-transmission>
          <lane2-recieve-loss>off</lane2-recieve-loss>
          <lane2-transmission-loss>off</lane2-transmission-loss>
          <lane2-transmission>off</lane2-transmission>
          <lane1-recieve-loss>off</lane1-recieve-loss>
          <lane1-transmission-loss>off</lane1-transmission-loss>
          <lane1-transmission>off</lane1-transmission>
          <power>Low</power>
          <reset-status>Reset</reset-status>
        </state>
      </qsfp>
      <channels>
        <channel>
          <index>1</index>
        </channel>
        <channel>
          <index>2</index>
        </channel>
        <channel>
          <index>3</index>
        </channel>
        <channel>
          <index>4</index>
        </channel>
      </channels>
    </transceiver>
  </component>
  <component>
    <name>QSFP-54</name>
    <state>
      <name>QSFP-54</name>
      <parent>PORT-ce54</parent>
      <product-name>NA</product-name>
      <oper-status>NA</oper-status>
      <removable>true</removable>
      <part-no>NA</part-no>
      <serial-no>NA</serial-no>
      <software-version>NA</software-version>
      <firmware-version>NA</firmware-version>
      <hardware-version>NA</hardware-version>
      <description>NA</description>
      <mfg-name>NA</mfg-name>
      <location>54</location>
```

```
        <type>transceiver</type>
      </state>
      <transceiver>
        <state>
          <channel-count>4</channel-count>
          <type>qsfp</type>
          <presence>Not-Present</presence>
          <port-no>54</port-no>
        </state>
        <qsfp>
          <state>
            <lane4-recieve-loss>off</lane4-recieve-loss>
            <lane4-transmission-loss>off</lane4-transmission-loss>
            <lane4-transmission>off</lane4-transmission>
            <lane3-recieve-loss>off</lane3-recieve-loss>
            <lane3-transmission-loss>off</lane3-transmission-loss>
            <lane3-transmission>off</lane3-transmission>
            <lane2-recieve-loss>off</lane2-recieve-loss>
            <lane2-transmission-loss>off</lane2-transmission-loss>
            <lane2-transmission>off</lane2-transmission>
            <lane1-recieve-loss>off</lane1-recieve-loss>
            <lane1-transmission-loss>off</lane1-transmission-loss>
            <lane1-transmission>off</lane1-transmission>
            <power>Low</power>
            <reset-status>Reset</reset-status>
          </state>
        </qsfp>
        <channels>
          <channel>
            <index>1</index>
          </channel>
          <channel>
            <index>2</index>
          </channel>
          <channel>
            <index>3</index>
          </channel>
          <channel>
            <index>4</index>
          </channel>
        </channels>
      </transceiver>
    </component>
  </components>
```

Show command

Here is Show command output that displays the hardware information for the transceiver.

```
OcNOS#show hardware-information transceiver

TX     : Transmit status
RX-Los : Receive status
RESET  : Normal (Out of reset), Reset (In reset)
POWER  : Power level Low/High
 -     : NotApplicable
```

```
SFP:[1-48]
-----------------------------------------------
PORT   PRESENCE        Tx         Rx-Los
-----------------------------------------------
1      Present         On         -
2      Present         On         -
3      Present         On         -
4      Present         On         -
5      Not Present     Off        -
6      Present         On         -
7      Not Present     Off        -
8      Not Present     Off        -
9      Not Present     Off        -
10     Present         On         -
11     Present         On         On
12     Not Present     Off        -
13     Not Present     Off        -
14     Not Present     Off        -
15     Not Present     Off        -
16     Not Present     Off        -
17     Not Present     Off        -
18     Not Present     Off        -
19     Not Present     Off        -
20     Not Present     Off        -
21     Not Present     Off        -
22     Not Present     Off        -
23     Not Present     Off        -
24     Not Present     Off        -
25     Not Present     Off        -
26     Not Present     Off        -
27     Not Present     Off        -
28     Not Present     Off        -
29     Not Present     Off        -
30     Not Present     Off        -
31     Not Present     Off        -
32     Not Present     Off        -
33     Not Present     Off        -
34     Not Present     Off        -
35     Not Present     Off        -
36     Not Present     Off        -
37     Not Present     Off        -
38     Not Present     Off        -
39     Not Present     Off        -
40     Not Present     Off        -
41     Not Present     Off        -
42     Not Present     Off        -
43     Not Present     Off        -
44     Not Present     Off        -
45     Not Present     Off        -
46     Not Present     Off        -
47     Not Present     Off        -
48     Not Present     Off        -

QSFP:[49-54]
-----------------------------------------------------------------------------
--------------
PORT   PRESENCE        RESET      POWER                                  LANE
```

```
-------------------------------------------------------------------------------
--------------
                                                          1          2
3          4
-------------------------------------------------------------------------------
--------------
49     Present         Normal     High       Tx         on         on
on         on
                                             Rx-Los     Off        Off
Off        Off
                                             Tx-Los     Off        Off
Off        Off
50     Not Present     Reset      Low        Tx         off        off
off        off
                                             Rx-Los     Off        Off
Off        Off
                                             Tx-Los     Off        Off
Off        Off
51     Present         Normal     High       Tx         on         on
on         on
                                             Rx-Los     Off        Off
Off        Off
                                             Tx-Los     Off        Off
Off        Off
52     Not Present     Reset      Low        Tx         off        off
off        off
                                             Rx-Los     Off        Off
Off        Off
                                             Tx-Los     Off        Off
Off        Off
53     Not Present     Reset      Low        Tx         off        off
off        off
                                             Rx-Los     Off        Off
Off        Off
                                             Tx-Los     Off        Off
Off        Off
54     Not Present     Reset      Low        Tx         off        off
off        off
                                             Rx-Los     Off        Off
Off        Off
                                             Tx-Los     Off        Off
Off        Off
```

EEPROM

This platform type displays board EEPROM details.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <state>
        <name>CHASSIS</name>
      </state>
    </component>
```

```
  </components>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
  <components xmlns="http://openconfig.net/yang/platform">
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>CHASSIS</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>CHASSIS</id>
        <name>CHASSIS</name>
        <parent>NA</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:ACTIVE</oper-status>
        <removable>false</removable>
        <part-no>FP3ZZ5654000A</part-no>
        <serial-no>591254X1849052</serial-no>
        <software-version>EC_AS5912-54X-OcNOS-5.0.137a-SP_MPLS-S0-P0</
software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>EC_AS5912-54X</description>
        <mfg-date xmlns="http://openconfig.net/yang/platform">2020-08-
18T21:58:52Z</mfg-date>
        <mfg-name>Accton</mfg-name>
        <location>0</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:CHASSIS</type>
      </state>
    </component>
  </components>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
  <components xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
    <component>
      <name>CHASSIS</name>
      <state>
        <name>CHASSIS</name>
        <parent>NA</parent>
        <product-name>5912-54X-O-AC-F</product-name>
        <oper-status>active</oper-status>
        <removable>false</removable>
        <part-no>FP3ZZ5654000A</part-no>
        <serial-no>591254X1849052</serial-no>
        <software-version>EC_AS5912-54X-OcNOS-5.0.137a-SP_MPLS-S0-P0</
software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>EC_AS5912-54X</description>
```

```
      <mfg-date>2020-08-18T21:58:52Z</mfg-date>
      <mfg-name>Accton</mfg-name>
      <location>0</location>
      <type>chassis</type>
    </state>
    <subcomponents>
      <subcomponent>
        <subcomponent-name>HARD-DISK</subcomponent-name>
        <state>
          <subcomponent-name>HARD-DISK</subcomponent-name>
        </state>
      </subcomponent>
      <subcomponent>
        <subcomponent-name>RAM</subcomponent-name>
        <state>
          <subcomponent-name>RAM</subcomponent-name>
        </state>
      </subcomponent>
      <subcomponent>
        <subcomponent-name>CPU</subcomponent-name>
        <state>
          <subcomponent-name>CPU</subcomponent-name>
        </state>
      </subcomponent>
      <subcomponent>
        <subcomponent-name>TEMPERATURE-SENSOR1</subcomponent-name>
        <state>
          <subcomponent-name>TEMPERATURE-SENSOR1</subcomponent-name>
        </state>
      </subcomponent>
      <subcomponent>
        <subcomponent-name>TEMPERATURE-SENSOR2</subcomponent-name>
        <state>
          <subcomponent-name>TEMPERATURE-SENSOR2</subcomponent-name>
        </state>
      </subcomponent>
      <subcomponent>
        <subcomponent-name>TEMPERATURE-SENSOR3</subcomponent-name>
        <state>
          <subcomponent-name>TEMPERATURE-SENSOR3</subcomponent-name>
        </state>
      </subcomponent>
      <subcomponent>
        <subcomponent-name>TEMPERATURE-BCM Chip</subcomponent-name>
        <state>
          <subcomponent-name>TEMPERATURE-BCM Chip</subcomponent-name>
        </state>
      </subcomponent>
      <subcomponent>
        <subcomponent-name>POWER-RAIL</subcomponent-name>
        <state>
          <subcomponent-name>POWER-RAIL</subcomponent-name>
        </state>
      </subcomponent>
      <subcomponent>
        <subcomponent-name>PSU-1</subcomponent-name>
        <state>
```

```
      <subcomponent-name>PSU-1</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PSU-2</subcomponent-name>
    <state>
      <subcomponent-name>PSU-2</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>FAN_TRAY-1</subcomponent-name>
    <state>
      <subcomponent-name>FAN_TRAY-1</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>FAN_TRAY-2</subcomponent-name>
    <state>
      <subcomponent-name>FAN_TRAY-2</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>FAN_TRAY-3</subcomponent-name>
    <state>
      <subcomponent-name>FAN_TRAY-3</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>FAN_TRAY-4</subcomponent-name>
    <state>
      <subcomponent-name>FAN_TRAY-4</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>FAN_TRAY-5</subcomponent-name>
    <state>
      <subcomponent-name>FAN_TRAY-5</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>FAN_TRAY-6</subcomponent-name>
    <state>
      <subcomponent-name>FAN_TRAY-6</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-lo</subcomponent-name>
    <state>
      <subcomponent-name>PORT-lo</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-eth0</subcomponent-name>
    <state>
      <subcomponent-name>PORT-eth0</subcomponent-name>
    </state>
  </subcomponent>
```

```
<subcomponent>
  <subcomponent-name>PORT-xe1</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe1</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe2</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe2</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe3</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe3</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe4</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe4</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe5</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe5</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe6</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe6</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe7</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe7</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe8</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe8</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe9</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe9</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe10</subcomponent-name>
  <state>
```

```
      <subcomponent-name>PORT-xe10</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe11</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe11</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe12</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe12</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe13</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe13</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe14</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe14</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe15</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe15</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe16</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe16</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe17</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe17</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe18</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe18</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe19</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe19</subcomponent-name>
    </state>
  </subcomponent>
```

```
<subcomponent>
  <subcomponent-name>PORT-xe20</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe20</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe21</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe21</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe22</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe22</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe23</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe23</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe24</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe24</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe25</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe25</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe26</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe26</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe27</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe27</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe28</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe28</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe29</subcomponent-name>
  <state>
```

```
      <subcomponent-name>PORT-xe29</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe30</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe30</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe31</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe31</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe32</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe32</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe33</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe33</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe34</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe34</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe35</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe35</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe36</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe36</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe37</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe37</subcomponent-name>
    </state>
  </subcomponent>
  <subcomponent>
    <subcomponent-name>PORT-xe38</subcomponent-name>
    <state>
      <subcomponent-name>PORT-xe38</subcomponent-name>
    </state>
  </subcomponent>
```

```
<subcomponent>
  <subcomponent-name>PORT-xe39</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe39</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe40</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe40</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe41</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe41</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe42</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe42</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe43</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe43</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe44</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe44</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe45</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe45</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe46</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe46</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe47</subcomponent-name>
  <state>
    <subcomponent-name>PORT-xe47</subcomponent-name>
  </state>
</subcomponent>
<subcomponent>
  <subcomponent-name>PORT-xe48</subcomponent-name>
  <state>
```

```
            <subcomponent-name>PORT-xe48</subcomponent-name>
          </state>
        </subcomponent>
        <subcomponent>
          <subcomponent-name>PORT-ce49</subcomponent-name>
          <state>
            <subcomponent-name>PORT-ce49</subcomponent-name>
          </state>
        </subcomponent>
        <subcomponent>
          <subcomponent-name>PORT-ce50</subcomponent-name>
          <state>
            <subcomponent-name>PORT-ce50</subcomponent-name>
          </state>
        </subcomponent>
        <subcomponent>
          <subcomponent-name>PORT-ce51</subcomponent-name>
          <state>
            <subcomponent-name>PORT-ce51</subcomponent-name>
          </state>
        </subcomponent>
        <subcomponent>
          <subcomponent-name>PORT-ce52</subcomponent-name>
          <state>
            <subcomponent-name>PORT-ce52</subcomponent-name>
          </state>
        </subcomponent>
        <subcomponent>
          <subcomponent-name>PORT-ce53</subcomponent-name>
          <state>
            <subcomponent-name>PORT-ce53</subcomponent-name>
          </state>
        </subcomponent>
        <subcomponent>
          <subcomponent-name>PORT-ce54</subcomponent-name>
          <state>
            <subcomponent-name>PORT-ce54</subcomponent-name>
          </state>
        </subcomponent>
        <subcomponent>
          <subcomponent-name>PORT-lo.management</subcomponent-name>
          <state>
            <subcomponent-name>PORT-lo.management</subcomponent-name>
          </state>
        </subcomponent>
      </subcomponents>
      <chassis>
        <state>
          <supported-switch-chip-revision>BCM88370_B0</supported-switch-chip-
revision>
          <supported-label-revision>R0BB</supported-label-revision>
          <fan-board-id>Reserved</fan-board-id>
          <switch-chip-revision>BCM88370_B0</switch-chip-revision>
          <cyclic-redundancy-32bit-value>0x797A6D84</cyclic-redundancy-32bit-
value>
          <diagnostic-version>0.0.5.9</diagnostic-version>
          <vendor-name>Edgecore</vendor-name>
```

```
          <onie-version>2018.05.00.04</onie-version>
          <platform-name>x86_64-accton_as5912_54x-r0</platform-name>
          <chassis-100g-ethernet-count>6</chassis-100g-ethernet-count>
          <chassis-50g-ethernet-count>0</chassis-50g-ethernet-count>
          <chassis-40g-ethernet-count>0</chassis-40g-ethernet-count>
          <chassis-25g-ethernet-count>0</chassis-25g-ethernet-count>
          <chassis-10g-ethernet-count>48</chassis-10g-ethernet-count>
          <chassis-1g-ethernet-count>0</chassis-1g-ethernet-count>
          <chassis-fast-ethernet-count>0</chassis-fast-ethernet-count>
          <power-supplies-count>2</power-supplies-count>
          <fan-tray-count>6</fan-tray-count>
          <country-code>TW</country-code>
          <label-revision>R02B</label-revision>
          <mac-address>B8:6A:97:A7:47:3C</mac-address>
          <up-time>517700</up-time>
        </state>
      </chassis>
    </component>
  </components>
```

Show command

Here is Show command output that displays the hardware information for the board.

```
OcNOS#show system-information board-info

System Board Information
========================
Product Name             : 5912-54X-O-AC-F
Part Number              : FP3ZZ5654000A
Serial Number            : 591254X1849052
Base MAC Address         : B8:6A:97:A7:47:3C
Manufacture Date         : 08/18/2020 21:58:52
Label Revision           : R02B
Platform Name            : x86_64-accton_as5912_54x-r0
ONIE Version             : 2018.05.00.04
MAC Addresses            : 256
Manufacturer             : Accton
Country Code             : TW
Vendor Name              : Edgecore
Diag Version             : 0.0.5.9
CRC-32                   : 0x797A6D84
Switch Chip Revision     : BCM88370_B0
CPLD 1 Board Info        : ES5654BQ
Fan Board Id             : Reserved
CPLD 1 PCB version ID    : Reserved
CPLD 1 Version           : 9
CPLD 2 Version           : 6
Fan CPLD Version         : 2
```

CPU

This platform type displays CPU load information.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter type="subtree">
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <state>
        <name>CPU</name>
      </state>
    </component>
  </components>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
  <components xmlns="http://openconfig.net/yang/platform">
    <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">
      <name>CPU</name>
      <state xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">
        <id>CPU</id>
        <name>CPU</name>
        <parent>CHASSIS</parent>
        <oper-status xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">ipi-oc-
platform-types-deviations:NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>0</location>
        <type xmlns:ipi-oc-platform-types-deviations="http://
www.ipinfusion.com/yang/ocnos/ipi-oc-platform-types-deviations">oc-platform-
types:CPU</type>
      </state>
    </component>
  </components>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
  <components xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
    <component>
      <name>CPU</name>
      <state>
        <name>CPU</name>
        <parent>CHASSIS</parent>
        <product-name>NA</product-name>
```

```
        <oper-status>NA</oper-status>
        <removable>false</removable>
        <part-no>NA</part-no>
        <serial-no>NA</serial-no>
        <software-version>NA</software-version>
        <firmware-version>NA</firmware-version>
        <hardware-version>NA</hardware-version>
        <description>NA</description>
        <mfg-name>NA</mfg-name>
        <location>0</location>
        <type>cpu</type>
      </state>
      <cpu>
        <state>
          <cpu-utilization-critical>50</cpu-utilization-critical>
          <cpu-utilization-alert>90</cpu-utilization-alert>
          <cpu-utilization>3.02</cpu-utilization>
          <cpu-15min-alert-threshold>50</cpu-15min-alert-threshold>
          <cpu-5min-alert-threshold>50</cpu-5min-alert-threshold>
          <cpu-1min-critical-threshold>40</cpu-1min-critical-threshold>
          <cpu-1min-alert-threshold>50</cpu-1min-alert-threshold>
          <cpu-15min-load-percentage>3.89</cpu-15min-load-percentage>
          <cpu-5min-load-percentage>5.57</cpu-5min-load-percentage>
          <cpu-1min-load-percentage>8.17</cpu-1min-load-percentage>
          <processor-count>4</processor-count>
        </state>
      </cpu>
    </component>
  </components>
```

Show command

Here is Show command output that displays the hardware information for the CPU load.

```
OcNOS#show system-information cpu-load

System CPU-Load Information
===========================

Uptime                     : 0 Days 1 Hours 29 Minutes 2 Seconds

Load Average(1 min)        : 5.93% (Crit Thresh : 40%, Alert Thresh : 50%)
Load Average(5 min)        : 4.06% (Crit Thresh : N/A, Alert Thresh : 50%)
Load Average(15 min)       : 3.28% (Crit Thresh : N/A, Alert Thresh : 50%)

Avg CPU Usage              : 3.02%
CPU core 1 Usage           : 3.74% (Crit Thresh : 50%, Alert Thresh : 90%)
CPU core 2 Usage           : 0.93% (Crit Thresh : 50%, Alert Thresh : 90%)
CPU core 3 Usage           : 6.48% (Crit Thresh : 50%, Alert Thresh : 90%)
CPU core 4 Usage           : 0.00% (Crit Thresh : 50%, Alert Thresh : 90%)
```

System OpenConfig Translation

Host

This XML configuration snippet is used to set the network name for the device that OcNOS uses in system prompts and default configuration filenames.
Using this command to set a network name also sets the host name in the Kernel.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to set the network name for the device.

```
<system xmlns="http://openconfig.net/yang/system">
  <config>
    <hostname>host123</hostname>
  </config>
</system>
```

OcNOS CLI command

This CLI command is used to set the network name for the device.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#hostname host123
OcNOS(config)#commit
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to set the network name for the device.

```
<system-info xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-system">
  <config>
    <hostname>host123</hostname>
  </config>
</system-info>
```

Validation

Here is a NetConf validation response that provides detailed information about setting the network name for the device.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<system xmlns="http://openconfig.net/yang/system">
    <config/>
    <state/>
</system>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for setting a network name for the device.

```
<system xmlns="http://openconfig.net/yang/system">
  <config>
    <hostname>host123</hostname>
  </config>
  <state>
    <hostname>host123</hostname>
    <current-datetime>2021-11-18T12:36:44Z</current-datetime>
  </state>
</system>
```

Unconfiguration

Use `operation='delete'` to unconfigure the configuration of network name on the device. Once unconfigured, the host name returns to the default name “OcNOS”.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to unconfigure.

```
<system xmlns="http://openconfig.net/yang/system">
  <config>
    <hostname operation="delete" />
  </config>
</system>
```

Restriction

As per RFC 952 and RFC 1123, a host name string can contain only the special characters period (“.”) and hyphen (“-”). These special characters cannot be at the start or end of a host name. The host name must be between 1 and 63 characters.

TimeZone Clock

This XML configuration snippet is used to set the system time zone.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to set the system time zone.

```
<system xmlns="http://openconfig.net/yang/system">
```

```
  <clock>
    <config>
       <timezone-name>Pacific</timezone-name>
    </config>
  </clock>
</system>
```

OcNOS CLI command

This CLI command is used to set the system time zone.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#clock timezone Pacific
OcNOS(config)#commit
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to set the system time zone.

```
<system xmlns="http://openconfig.net/yang/system">
  <clock>
    <config>
      <timezone-name>Pacific</timezone-name>
    </config>
  </clock>
</system>
```

Validation

Here is a NetConf validation response that provides detailed information about setting system time zone.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<system xmlns="http://openconfig.net/yang/system">
  <clock/>
</system>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for setting system time zone.

```
<system xmlns="http://openconfig.net/yang/system">
  <clock>
    <config>
      <timezone-name>Pacific</timezone-name>
    </config>
    <state>
      <timezone-name>Pacific</timezone-name>
    </state>
  </clock>
</system>
```

Restrictions

The names allowed to be used for the time zone can be queried using the `show timezone <macro region>` CLI command.

There is currently no provision to query this list through OpenConfig.

Rsyslog

This XML configuration snippet is used to change the Virtual Routing and Forwarding (VRF) of Rsyslog log processing system.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to change the VRF of Rsyslog.

```
<system xmlns="http://openconfig.net/yang/system">
  <logging>
    <remote-servers>
      <config xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-
deviations">
        <vrf>management</vrf>
      </config>
    </remote-servers>
  </logging>
</system>
```

OcNOS CLI command

This CLI command is used to change the VRF of Rsyslog.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#feature rsyslog vrf management
OcNOS(config)#commit
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to change the VRF of Rsyslog.

```
<logging xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-logging">
  <rsyslog>
    <vrf>management</vrf>
    <config>
      <vrf>management</vrf>
    </config>
  </rsyslog>
</logging>
```

Validation

Here is a NetConf validation response that provides detailed information about changing VRF of Rsyslog.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<system xmlns="http://openconfig.net/yang/system">
  <logging/>
</system>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for changing VRF for Rsyslog.

```
<system xmlns="http://openconfig.net/yang/system">
  <logging>
    <remote-servers>
      <config xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-
deviations">
        <vrf>management</vrf>
      </config>
      <state xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-
deviations">
        <vrf>management</vrf>
      </state>
    </remote-servers>
  </logging>
</system>
```

Restrictions

The leaf `system/logging/remote-servers/config/vrf` accepts only default or management.

Logging Remote Server

This XML configuration snippet is used to set a syslog server.
OcNOS supports logging messages to a syslog server in addition to logging to a file or the console (local or ssh/telnet console). Messages can be logged to a local syslog server (the machine on which OcNOS executes) as well as one or more remote syslog servers.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to set a syslog server.

```
<system xmlns="http://openconfig.net/yang/system">
  <logging>
    <remote-servers>
```

```
      <config xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-
deviations">
        <vrf>management</vrf>
      </config>
      <remote-server>
        <host>2.2.2.3</host>
        <config>
          <host>2.2.2.3</host>
        </config>
        <selectors>
          <selector>
            <severity>DEBUG</severity>
            <config>
              <severity>DEBUG</severity>
            </config>
          </selector>
        </selectors>
      </remote-server>
    </remote-servers>
  </logging>
</system>
```

OcNOS CLI command

This CLI command is used to set a syslog server.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#logging remote server 2.2.2.3 7 vrf management
OcNOS(config)#commit
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to set a syslog server.

```
<logging xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-logging">
        <rsyslog>
          <vrf>management</vrf>
          <remote-servers>
            <remote-server>
              <address>2.2.2.3</address>
              <config>
                <address>2.2.2.3</address>
                <severity>7</severity>
              </config>
            </remote-server>
          </remote-servers>
          <config>
            <vrf>management</vrf>
            <vrf>default</vrf>
            <enable-rsyslog>rsyslog</enable-rsyslog>
          </config>
        </rsyslog>
      </logging>
```

Validation

Here is a NetConf validation response that provides detailed information about setting a syslog server.

Get Openconfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<system xmlns="http://openconfig.net/yang/system">
  <logging/>
</system>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for setting a syslog server.

```
 <system xmlns="http://openconfig.net/yang/system">
    <logging>
      <remote-servers>
        <config xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-
deviations">
          <vrf>management</vrf>
        </config>
        <state xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-
deviations">
          <vrf>management</vrf>
        </state>
        <remote-server>
          <host>2.2.2.3</host>
          <config>
            <host>2.2.2.3</host>
          </config>
          <selectors>
            <selector>
              <severity>DEBUG</severity>
              <config>
                <severity>DEBUG</severity>
              </config>
              <state>
                <severity>DEBUG</severity>
              </state>
            </selector>
          </selectors>
          <state>
            <host>2.2.2.3</host>
          </state>
        </remote-server>
      </remote-servers>
    </logging>
  </system>
```

Restrictions

- When configuring `/system/logging/remote-servers/remote-server/selectors/selector/config/facility` leaf, it is mapped on IPI data model as `/logging/global/config/remote-server-facility` leaf, which is a single and global configuration. To avoid issues during configuration, the value of OpenConfig `facility` leaf must be the same on all `facility` leaves indicated on Payload. Otherwise, IPI

chooses one `facility` value among all the values present on payload for the configuration of all `facility` leaves.

- When the delete operation is set on OpenConfig path `/system/logging/remote-servers`, it triggers the deletion of IPI data model `/logging/global/config/remote-server-facility` leaf.
- When the OpenConfig objects`/system/logging/remote-servers/remote-server` are deleted individually, it will not trigger the deletion of IPI datamodel `/logging/global/config/remote-server-facility` leaf. In this case, this leaf will not be shown on NetConf Get output, but will be shown on `show running-config` CLI.

Logging Remote Facility

This XML configuration snippet is used to set a syslog servers facility.
OcNOS supports logging messages to one or more remote syslog servers, but the same facility is used for all the servers.
Use the number form of this command to apply the default facility value, which is local7.

Release

This configuration was introduced in OcNOS version 5.0

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to set syslog servers facility.

```
  <system xmlns="http://openconfig.net/yang/system">
    <logging>
      <remote-servers>
        <config xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-
deviations">
          <vrf>management</vrf>
        </config>
        <remote-server>
          <host>2.2.2.3</host>
          <config>
            <host>2.2.2.3</host>
          </config>
          <selectors>
            <selector>
              <facility>oc-log:LOCAL5</facility>
              <severity>DEBUG</severity>
              <config>
                <facility>oc-log:LOCAL5</facility>
                <severity>DEBUG</severity>
              </config>
            </selector>
          </selectors>
        </remote-server>
      </remote-servers>
    </logging>
  </system>
```

OcNOS CLI command

The below CLI command is used to set syslog servers facility.

```
OcNOS#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#logging remote facility local5
OcNOS(config)#commit
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to set syslog servers facility.

```
<logging>
  <remote-servers>
    <config xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-
deviations">
      <vrf>management</vrf>
    </config>
    <remote-server>
      <host>2.2.2.3</host>
      <config>
        <host>2.2.2.3</host>
      </config>
      <selectors>
        <selector>
          <facility>oc-log:LOCAL5</facility>
          <severity>DEBUG</severity>
          <config>
            <facility>oc-log:LOCAL5</facility>
            <severity>DEBUG</severity>
          </config>
        </selector>
      </selectors>
    </remote-server>
  </remote-servers>
</logging>
```

Validation

Here is a NetConf validation response that provides detailed information about setting a syslog servers facility.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<system xmlns="http://openconfig.net/yang/system">
  <logging/>
</system>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for setting a syslog servers facility.

```
<system xmlns="http://openconfig.net/yang/system">
  <logging>
    <remote-servers>
```

```
      <config xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-
deviations">
        <vrf>management</vrf>
      </config>
      <state xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-sys-
deviations">
        <vrf>management</vrf>
      </state>
      <remote-server>
        <host>2.2.2.3</host>
        <config>
          <host>2.2.2.3</host>
        </config>
        <selectors>
          <selector>
            <facility>oc-log:LOCAL5</facility>
            <severity>DEBUG</severity>
            <config>
              <facility>oc-log:LOCAL5</facility>
              <severity>DEBUG</severity>
            </config>
            <state>
              <facility>oc-log:LOCAL5</facility>
              <severity>DEBUG</severity>
            </state>
          </selector>
        </selectors>
        <state>
          <host>2.2.2.3</host>
        </state>
      </remote-server>
    </remote-servers>
  </logging>
</system>
```

Restrictions

- The `facility` leaf can only be added using OpenConfig to a configured remote server, as it is a part of the object's key on the path `/system/logging/remote-servers/remote-server/selectors/selector`.
- When configuring `/system/logging/remote-servers/remote-server/selectors/selector/config/facility` leaf, it is mapped on IPI data model as `/logging/global/config/remote-server-facility` leaf, which is a single and global configuration. To avoid issues during configuration, the value of OpenConfig `facility` leaf must be the same on all `facility` leaves indicated on Payload. Otherwise, IPI chooses one `facility` value among all the values present on payload for the configuration of all `facility` leaves.
- When the delete operation is set on OpenConfig path `/system/logging/remote-servers`, it triggers the deletion of IPI data model `/logging/global/config/remote-server-facility` leaf.
- When the OpenConfig objects`/system/logging/remote-servers/remote-server` are deleted individually, it will not trigger the deletion of IPI datamodel `/logging/global/config/remote-server-facility` leaf. In this case, this leaf will not be shown on NetConf Get output, but will be shown on `show running-config` CLI.

Alarms

Alarms do not have a configuration on OpenConfig. It is a runtime attribute, and when some event triggers the alarm, it can be viewed on OpenConfig.

Use the following CLI command to enable Alarms:

```
OcNOS#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#fault-management enable
OcNOS(config)#commit
```

To enable Alarms., it is necessary to change the logging levels to 4 or more using the following command:

```
OcNOS#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#logging level all 4
OcNOS(config)#commit
```

Release

This configuration was introduced in OcNOS version 5.1.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
  <system xmlns="http://openconfig.net/yang/system">
    <alarms/>
  </system>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for enabling the alarm.

```
<system xmlns="http://openconfig.net/yang/system">
  <alarms>
    <alarm>
      <id>IFMGR_IF_DOWN:ce2/1</id>
      <state>
        <id>IFMGR_IF_DOWN:ce2/1</id>
        <type-id>EQPT</type-id>
        <severity xmlns:oc-alarm-types="http://openconfig.net/yang/alarms/
types">oc-alarm-types:MAJOR</severity>
        <alarm-reported-timestamp xmlns="http://www.ipinfusion.com/yang/ocnos/
ipi-oc-sys-deviations">Thu Dec 16 2021 20:31:28 UTC</alarm-reported-timestamp>
        <time-created>1639686688</time-created>
        <text>OcNOS [IFMGR_IF_DOWN] Interface ce2/1 changed state to down</
text>
        <resource>ce2/1</resource>
      </state>
    </alarm>
  </alarms>
</system>
```

OcNOS CLI show command

This OcNOS CLI show command is used to enable the alarm.

```
OcNOS#show alarm active
Active Alarms received:-
Active Alarm Count: 2
Severity     Status     Alarm Description
MAJOR        Active     OcNOS [IFMGR_IF_DOWN] Interface ce2/1 changed state to
down
```

Restrictions

The alarms get generated only for some events as mentioned in the list here:

https://jira-ipi.atlassian.net/wiki/spaces/IPI/pages/741900306/Alarms+Datamodel+Design+Document#3.1.3--List-of-supported%2Fregistered-alarms-in-OcNOS-5.1

https://jira-ipi.atlassian.net/wiki/spaces/IPI/pages/741900306/Alarms+Datamodel+Design+Document#3.1.2--List-of-supported%2Fregistered-alarms-in-OcNOS-5.0

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VLAN OpenConfig Translation

Match Single Tagged VLAN

This XML configuration snippet is used to set a single tag VLAN match.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to set a single tag VLAN match.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
    <interface>
      <name>xe24</name>
      <config>
        <name>xe24</name>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
      </config>
      <subinterfaces>
        <subinterface>
          <index>20</index>
          <config>
            <index>20</index>
          </config>
          <vlan xmlns="http://openconfig.net/yang/vlan">
            <match>
              <single-tagged-list>
                <config>
                  <vlan-ids>6</vlan-ids>
                </config>
              </single-tagged-list>
            </match>
          </vlan>
        </subinterface>
      </subinterfaces>
    </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to set a single tag VLAN match.

```
interface xe24.20
 encapsulation dot1q 6
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to set a single tag VLAN match.

```
        <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
          <interface>
            <name>xe24</name>
            <config>
              <name>xe24</name>
            </config>
          </interface>
          <interface>
            <name>xe24.20</name>
            <config>
              <name>xe24.20</name>
            </config>
            <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
extended">
              <subinterface-encapsulation>
                <single-tag-vlan-matches>
                  <single-tag-vlan-match>
                    <encapsulation-type>dot1q</encapsulation-type>
                    <config>
                      <encapsulation-type>dot1q</encapsulation-type>
                      <outer-vlan-id>6</outer-vlan-id>
                    </config>
                  </single-tag-vlan-match>
                </single-tag-vlan-matches>
              </subinterface-encapsulation>
            </extended>
          </interface>
        </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that gives a detailed information about the single tagged VLAN match.

```
      <interfaces xmlns="http://openconfig.net/yang/interfaces">
        <interface>
          <name>xe24</name>
          <config>
            <name>xe24</name>
            <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
          </config>
              <vlan xmlns="http://openconfig.net/yang/vlan">
                <match>
                  <single-tagged-list>
                    <config>
                      <vlan-ids>6</vlan-ids>
                    </config>
                    <state>
                      <vlan-ids>6</vlan-ids>
                    </state>
                  </single-tagged-list>
                </match>
              </vlan>
```

```
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

None

Match single tagged VLAN range

This XML configuration snippet is used to set a single tag VLAN range in a subinterface.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to set a single tag VLAN range in a subinterface.

```
        <interfaces xmlns="http://openconfig.net/yang/interfaces">
          <interface>
            <name>xe26</name>
            <subinterfaces>
              <subinterface>
                <index>10</index>
                <config>
                  <index>10</index>
                </config>
                <vlan xmlns="http://openconfig.net/yang/vlan">
                  <match>
                    <single-tagged-range>
                      <config>
                        <low-vlan-id>10</low-vlan-id>
                        <high-vlan-id>20</high-vlan-id>
                      </config>
                    </single-tagged-range>
                  </match>
                  <ingress-mapping>
                    <config>
                      <vlan-stack-action>PUSH</vlan-stack-action>
                      <vlan-id>15</vlan-id>
                      <tpid xmlns:oc-vlan-types="http://openconfig.net/yang/
vlan-types">oc-vlan-types:TPID_0X88A8</tpid>
                    </config>
                  </ingress-mapping>
                </vlan>
              </subinterface>
            </subinterfaces>
          </interface>
        </interfaces>
```

OcNOS CLI Command

The below CLI command is used to set a single tag VLAN range in a subinterface.

```
interface xe26.10 switchport
 encapsulation dot1q 10-20
 rewrite push 0x88a8 15
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to set a single tag VLAN range in a subinterface.

```
        <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
          <interface>
            <name>xe26</name>
            <config>
              <name>xe26</name>
            </config>
          </interface>
          <interface>
            <name>xe26.10</name>
            <config>
              <name>xe26.10</name>
              <enable-switchport />
            </config>
            <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
extended">
              <subinterface-encapsulation>
                <single-tag-vlan-matches>
                  <single-tag-vlan-match>
                    <encapsulation-type>dot1q</encapsulation-type>
                    <config>
                      <encapsulation-type>dot1q</encapsulation-type>
                      <outer-vlan-id>10-20</outer-vlan-id>
                    </config>
                  </single-tag-vlan-match>
                </single-tag-vlan-matches>
                <rewrite>
                  <config>
                    <vlan-action>push</vlan-action>
                    <push-outer-vlan-id>15</push-outer-vlan-id>
                    <push-tpid>0x88a8</push-tpid>
                  </config>
                </rewrite>
              </subinterface-encapsulation>
            </extended>
          </interface>
        </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about the single tag VLAN range in a subinterface.

```
      <interfaces xmlns="http://openconfig.net/yang/interfaces">
        <interface>
```

```
      <name>xe26</name>
      <config>
        <name>xe26</name>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
      </config>
      <subinterfaces>
        <subinterface>
          <index>0</index>
          <config>
            <index>0</index>
          </config>
        </subinterface>
        <subinterface>
          <index>10</index>
          <config>
            <index>10</index>
          </config>
          <state>
            <name>xe26.10</name>
            <logical>true</logical>
            <oper-status>DOWN</oper-status>
            <ifindex>328531978</ifindex>
            <counters>
              <last-clear>0</last-clear>
              <out-pkts>0</out-pkts>
              <out-octets>0</out-octets>
              <in-pkts>0</in-pkts>
              <in-octets>0</in-octets>
            </counters>
          </state>
          <vlan xmlns="http://openconfig.net/yang/vlan">
            <ingress-mapping>
              <config>
                <vlan-stack-action>PUSH</vlan-stack-action>
                <tpid>TPID_0X88A8</tpid>
                <vlan-id>15</vlan-id>
              </config>
              <state>
                <vlan-stack-action>PUSH</vlan-stack-action>
                <tpid>TPID_0X88A8</tpid>
                <vlan-id>15</vlan-id>
              </state>
            </ingress-mapping>
            <match>
              <single-tagged-range>
                <config>
                  <low-vlan-id>10</low-vlan-id>
                  <high-vlan-id>20</high-vlan-id>
                </config>
                <state>
                  <low-vlan-id>10</low-vlan-id>
                  <high-vlan-id>20</high-vlan-id>
                </state>
              </single-tagged-range>
            </match>
          </vlan>
```

```
        </subinterface>
      </subinterfaces>
    </interface>
</interfaces>
```

Restrictions

If OcNOS “switchport” parameter has not been set previously on subinterface, VLAN range match needs to be configured along with ingress-mapping or added in the cross-connect network-instance.

Match double tagged VLAN

This XML configuration snippet is used to set an outer VLAN match in a subinterface.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to set an outer VLAN match in a subinterface.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
     <interface>
       <name>xe37</name>
       <config>
         <name>xe37</name>
         <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
       </config>
       <subinterfaces>
         <subinterface>
           <index>100</index>
           <config>
             <index>100</index>
           </config>
           <vlan xmlns="http://openconfig.net/yang/vlan">
             <match>
               <double-tagged-outer-list>
                 <config>
  <outer-vlan-ids>400</outer-vlan-ids>
                 </config>
               </double-tagged-outer-list>
             </match>
           </vlan>
         </subinterface>
       </subinterfaces>
     </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to set an outer VLAN match in a subinterface.

```
interface xe37.100
 encapsulation dot1ad 400
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to set an outer VLAN match in a subinterface.

```
        <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
          <interface>
            <name>xe37</name>
            <config>
              <name>xe37</name>
            </config>
          </interface>
          <interface>
            <name>xe37.100</name>
            <config>
              <name>xe37.100</name>
            </config>
            <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
extended">
              <subinterface-encapsulation>
                <single-tag-vlan-matches>
                  <single-tag-vlan-match>
                    <encapsulation-type>dot1ad</encapsulation-type>
                    <config>
                      <encapsulation-type>dot1ad</encapsulation-type>
                      <outer-vlan-id>400</outer-vlan-id>
                    </config>
                  </single-tag-vlan-match>
                </single-tag-vlan-matches>
              </subinterface-encapsulation>
            </extended>
          </interface>
        </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about the outer VLAN match in a subinterface.

```
      <interfaces xmlns="http://openconfig.net/yang/interfaces">
        <interface>
          <name>xe37</name>
          <config>
            <name>xe37</name>
          </config>
          <subinterfaces>
            <subinterface>
              <index>100</index>
              <config>
                <index>100</index>
              </config>
```

```
            <state>
              <name>xe37.100</name>
              <logical>true</logical>
              <oper-status>DOWN</oper-status>
              <ifindex>328892516</ifindex>
              <counters>
                <last-clear>0</last-clear>
                <out-pkts>0</out-pkts>
                <out-octets>0</out-octets>
                <in-pkts>0</in-pkts>
                <in-octets>0</in-octets>
              </counters>
            </state>
            <vlan xmlns="http://openconfig.net/yang/vlan">
              <match>
                <double-tagged-outer-list>
                  <config>
                    <outer-vlan-ids>400</outer-vlan-ids>
                  </config>
                  <state>
                    <outer-vlan-ids>400</outer-vlan-ids>
                  </state>
                </double-tagged-outer-list>
              </match>
            </vlan>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

Double-tagged-outer-list does not support the inner-vlan-id configuration.

Match double tagged with outer and inner VLAN

This XML configuration snippet is used to set outer and inner VLAN match in a subinterface.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to set outer and inner VLAN match in a subinterface.

```
 <interfaces xmlns="http://openconfig.net/yang/interfaces">
    <interface>
      <name>xe25</name>
      <config>
        <name>xe25</name>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
```

```
        </config>
        <subinterfaces>
          <subinterface>
            <index>20</index>
            <config>
              <index>20</index>
            </config>
            <vlan xmlns="http://openconfig.net/yang/vlan">
              <match>
                <double-tagged>
                  <config>
                    <outer-vlan-id>40</outer-vlan-id>
                    <inner-vlan-id>30</inner-vlan-id>
                  </config>
                </double-tagged>
              </match>
            </vlan>
          </subinterface>
        </subinterfaces>
      </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to set outer and inner VLAN match in a subinterface.

```
interface xe25.20
 encapsulation dot1ad 40 inner-dot1q 30
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to set outer and inner VLAN match in a subinterface.

```
        <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
          <interface>
            <name>xe25</name>
            <config>
              <name>xe25</name>
            </config>
          </interface>
          <interface>
            <name>xe25.20</name>
            <config>
              <name>xe25.20</name>
            </config>
            <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
extended">
              <subinterface-encapsulation>
                <double-tag-vlan-matches>
                  <double-tag-vlan-match>
                    <encapsulation-type>dot1ad</encapsulation-type>
                    <outer-vlan-id>40</outer-vlan-id>
                    <config>
                      <encapsulation-type>dot1ad</encapsulation-type>
                      <outer-vlan-id>40</outer-vlan-id>
                      <inner-vlan-id>30</inner-vlan-id>
```

```
            </config>
          </double-tag-vlan-match>
        </double-tag-vlan-matches>
      </subinterface-encapsulation>
    </extended>
  </interface>
</interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about the outer and inner VLAN match in a subinterface.

```
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe25</name>
    <config>
      <name>xe25</name>
    </config>
    <subinterfaces>
      <subinterface>
        <index>20</index>
        <config>
          <index>20</index>
        </config>
        <state>
          <name>xe25.20</name>
          <logical>true</logical>
          <oper-status>DOWN</oper-status>
          <ifindex>328499220</ifindex>
          <counters>
            <last-clear>0</last-clear>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
        </state>
        <vlan xmlns="http://openconfig.net/yang/vlan">
          <match>
            <double-tagged>
              <config>
                <outer-vlan-id>40</outer-vlan-id>
                <inner-vlan-id>30</inner-vlan-id>
              </config>
              <state>
                <outer-vlan-id>40</outer-vlan-id>
                <inner-vlan-id>30</inner-vlan-id>
              </state>
            </double-tagged>
          </match>
        </vlan>
      </subinterface>
    </subinterfaces>
  </interface>
</interfaces>
```

Restrictions

None

Ingress-mapping actions

This XML configuration snippet is used to configure an ingress-mapping with VLAN actions. The allowed actions are PUSH, POP and SWAP.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure an ingress-mapping with VLAN actions.

```
       <interfaces xmlns="http://openconfig.net/yang/interfaces">
        <interface>
          <name>xe32</name>
          <config>
            <name>xe32</name>
            <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
    type">ianaift:ethernetCsmacd</type>
          </config>
          <subinterfaces>
            <subinterface>
              <index>100</index>
              <config>
                <index>100</index>
              </config>
              <vlan xmlns="http://openconfig.net/yang/vlan">
                <match>
                  <single-tagged-list>
                    <config>
                      <vlan-ids>10</vlan-ids>
                    </config>
                  </single-tagged-list>
                </match>
                <ingress-mapping>
                  <config>
                    <vlan-stack-action>SWAP</vlan-stack-action>
                    <tpid>TPID_0X8100</tpid>
                    <vlan-id>100</vlan-id>
                  </config>
                </ingress-mapping>
              </vlan>
            </subinterface>
          </subinterfaces>
        </interface>
      </interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure an ingress-mapping with VLAN actions.

```
interface xe32.100 switchport
 encapsulation dot1q 10
 rewrite translate 1-to-1 0x8100 100
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure an ingress-mapping with VLAN actions.

```
        <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
          <interface>
            <name>xe32</name>
            <config>
              <name>xe32</name>
            </config>
          </interface>
          <interface>
            <name>xe32.100</name>
            <config>
              <name>xe32.100</name>
              <enable-switchport />
            </config>
            <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-
extended">
              <subinterface-encapsulation>
                <single-tag-vlan-matches>
                  <single-tag-vlan-match>
                    <encapsulation-type>dot1q</encapsulation-type>
                    <config>
                      <encapsulation-type>dot1q</encapsulation-type>
                      <outer-vlan-id>10</outer-vlan-id>
                    </config>
                  </single-tag-vlan-match>
                </single-tag-vlan-matches>
                <rewrite>
                  <config>
                    <vlan-action>translate</vlan-action>
                    <rewrite-translate-action>1-to-1</rewrite-translate-action>
                    <dot1q-dot1ad-tpid>0x8100</dot1q-dot1ad-tpid>
                    <outer-vlan-id>100</outer-vlan-id>
                  </config>
                </rewrite>
              </subinterface-encapsulation>
            </extended>
          </interface>
        </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about ingress-mapping with VLAN actions, PUSH, POP and SWAP.

```
        <interfaces xmlns="http://openconfig.net/yang/interfaces">
```

```
      <interface>
        <name>xe32</name>
        <config>
          <name>xe32</name>
        </config>
        <subinterfaces>
          <subinterface>
            <index>100</index>
            <config>
              <index>100</index>
            </config>
            <state>
              <name>xe32.100</name>
              <logical>true</logical>
              <oper-status>DOWN</oper-status>
              <ifindex>328728676</ifindex>
              <counters>
                <last-clear>0</last-clear>
                <out-pkts>0</out-pkts>
                <out-octets>0</out-octets>
                <in-pkts>0</in-pkts>
                <in-octets>0</in-octets>
              </counters>
            </state>
            <vlan xmlns="http://openconfig.net/yang/vlan">
              <ingress-mapping>
                <config>
                  <vlan-stack-action>SWAP</vlan-stack-action>
                  <tpid
                    xmlns:oc-vlan-types="http://openconfig.net/yang/vlan-
types">oc-vlan-types:TPID_0X8100</tpid>
                  <vlan-id>100</vlan-id>
                </config>
                <state>
                  <vlan-stack-action>SWAP</vlan-stack-action>
                  <tpid
                    xmlns:oc-vlan-types="http://openconfig.net/yang/vlan-
types">oc-vlan-types:TPID_0X8100</tpid>
                  <vlan-id>100</vlan-id>
                </state>
              </ingress-mapping>
              <match>
                <single-tagged-list>
                  <config>
                    <vlan-ids>10</vlan-ids>
                  </config>
                  <state>
                    <vlan-ids>10</vlan-ids>
                  </state>
                </single-tagged-list>
              </match>
            </vlan>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

Match is optional only for VLAN action PUSH. If not used, it will set encapsulation default in OcNOS.

Trunk VLANs in interface

This XML configuration snippet is used to configure a trunk VLAN range in an interface.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure a trunk VLAN range in an interface.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
      <name>1</name>
      <config>
        <name>1</name>
        <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2L3</type>
        <bridge-protocol xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-
ni-augments">ieee-vlan-bridge</bridge-protocol>
      </config>
      <vlans>
        <vlan>
          <vlan-id>350</vlan-id>
          <config>
            <vlan-id>350</vlan-id>
            <status>ACTIVE</status>
          </config>
        </vlan>
        <vlan>
          <vlan-id>351</vlan-id>
          <config>
            <vlan-id>351</vlan-id>
            <status>ACTIVE</status>
          </config>
        </vlan>
        <vlan>
          <vlan-id>352</vlan-id>
          <config>
            <vlan-id>352</vlan-id>
            <status>ACTIVE</status>
          </config>
        </vlan>
      </vlans>
           <interfaces>
             <interface>
               <id>xe7</id>
               <config>
```

```
                <interface>xe7</interface>
                <id>xe7</id>
              </config>
            </interface>
          </interfaces>
    </network-instance>
</network-instances>
   <interfaces xmlns="http://openconfig.net/yang/interfaces">
    <interface>
      <name>xe7</name>
      <config>
        <name>xe7</name>
        <tpid xmlns="http://openconfig.net/yang/vlan">TPID_0X8100</tpid>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
      </config>
      <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
        <switched-vlan xmlns="http://openconfig.net/yang/vlan">
          <config>
            <interface-mode>TRUNK</interface-mode>
            <trunk-vlans>350..352</trunk-vlans>
          </config>
        </switched-vlan>
      </ethernet>
    </interface>
    </interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure a trunk VLAN range in an interface.

```
bridge 1 protocol ieee vlan-bridge
!
vlan database
 vlan 350-352 bridge 1 state enable
!
interface xe7
 switchport
 dot1ad ethertype 0x8100
 bridge-group 1
 switchport mode trunk
 switchport trunk allowed vlan add 350-352
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure a trunk VLAN range in an interface.

```
      <network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
network-instance">
        <network-instance>
          <instance-name>1</instance-name>
          <instance-type>l2ni</instance-type>
          <bridge xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bridge">
            <config>
              <protocol>ieee-vlan-bridge</protocol>
            </config>
            <vlans xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vlan">
```

```
          <vlan>
            <vlan-id>350</vlan-id>
            <config>
              <vlan-id>350</vlan-id>
            </config>
            <customer-vlan>
              <config>
                <state>enable</state>
              </config>
            </customer-vlan>
          </vlan>
          <vlan>
            <vlan-id>351</vlan-id>
            <config>
              <vlan-id>351</vlan-id>
            </config>
            <customer-vlan>
              <config>
                <state>enable</state>
              </config>
            </customer-vlan>
          </vlan>
          <vlan>
            <vlan-id>352</vlan-id>
            <config>
              <vlan-id>352</vlan-id>
            </config>
            <customer-vlan>
              <config>
                <state>enable</state>
              </config>
            </customer-vlan>
          </vlan>
        </vlans>
        <bridge-ports>
          <interface>
            <name>xe7</name>
            <config>
              <name>xe7</name>
            </config>
          </interface>
        </bridge-ports>
      </bridge>
      <config>
        <instance-name>1</instance-name>
        <instance-type>l2ni</instance-type>
      </config>
    </network-instance>
  </network-instances>
  <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
    <interface>
      <name>xe7</name>
      <config>
        <name>xe7</name>
        <dot1ad-ether-type>0x8100</dot1ad-ether-type>
        <enable-switchport />
      </config>
```

```
          <port-vlan xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-port-
vlan">
            <switched-vlan>
              <interface-mode>trunk</interface-mode>
              <config>
                <interface-mode>trunk</interface-mode>
              </config>
              <allowed-vlan>
                <config>
                  <allowed-vlan-id>350-352</allowed-vlan-id>
                </config>
              </allowed-vlan>
            </switched-vlan>
          </port-vlan>
        </interface>
      </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about the trunk VLAN range in an interface.

```
    <network-instances xmlns="http://openconfig.net/yang/network-instance">
      <network-instance>
        <name>1</name>
        <config>
          <name>1</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2L3</type>
          <bridge-protocol xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-
ni-augments">ieee-vlan-bridge</bridge-protocol>
        </config>
        <state>
          <name>1</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2L3</type>
        </state>
        <fdb>
          <config>
            <mac-learning>true</mac-learning>
          </config>
        </fdb>
        <interfaces>
          <interface>
            <id>xe7</id>
            <config>
              <id>xe7</id>
              <interface>xe7</interface>
            </config>
            <state>
              <id>xe7</id>
              <interface>xe7</interface>
            </state>
          </interface>
        </interfaces>
        <vlans>
```

```
        <vlan>
          <vlan-id>350</vlan-id>
          <config>
            <vlan-id>350</vlan-id>
            <status>ACTIVE</status>
          </config>
          <state>
            <vlan-id>350</vlan-id>
            <status>ACTIVE</status>
          </state>
          <members>
            <member>
              <state>
                <interface>xe7</interface>
              </state>
            </member>
          </members>
        </vlan>
        <vlan>
          <vlan-id>351</vlan-id>
          <config>
            <vlan-id>351</vlan-id>
            <status>ACTIVE</status>
          </config>
          <state>
            <vlan-id>351</vlan-id>
            <status>ACTIVE</status>
          </state>
          <members>
            <member>
              <state>
                <interface>xe7</interface>
              </state>
            </member>
          </members>
        </vlan>
        <vlan>
          <vlan-id>352</vlan-id>
          <config>
            <vlan-id>352</vlan-id>
            <status>ACTIVE</status>
          </config>
          <state>
            <vlan-id>352</vlan-id>
            <status>ACTIVE</status>
          </state>
          <members>
            <member>
              <state>
                <interface>xe7</interface>
              </state>
            </member>
          </members>
        </vlan>
      </vlans>
    </network-instance>
  </network-instances>
```

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe7</name>
        <config>
          <name>xe7</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe7</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <logical>false</logical>
          <last-change>318900</last-change>
          <oper-status>UP</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>5007</ifindex>
          <counters>
            <last-clear>1642442144</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>145</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>145</out-pkts>
            <out-octets>9412</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b8:6a:97:c3:64:44</hw-mac-address>
            <counters>
              <in-crc-errors>0</in-crc-errors>
              <in-jabber-frames>0</in-jabber-frames>
              <in-fragment-frames>0</in-fragment-frames>
              <in-oversize-frames>0</in-oversize-frames>
            </counters>
          </state>
          <switched-vlan xmlns="http://openconfig.net/yang/vlan">
            <config>
```

```
              <interface-mode>TRUNK</interface-mode>
              <trunk-vlans>350..352</trunk-vlans>
            </config>
            <state>
              <interface-mode>TRUNK</interface-mode>
              <trunk-vlans>350..352</trunk-vlans>
            </state>
          </switched-vlan>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

VLANs associated to trunk interface must also be created and bridge must be associated to the interface.

Trunk interface with native VLAN

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure a native VLAN for a trunk VLAN interface.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>xe7</name>
        <config>
          <name>xe7</name>
          <tpid xmlns="http://openconfig.net/yang/vlan">TPID_0X8100</tpid>
          <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <switched-vlan xmlns="http://openconfig.net/yang/vlan">
            <config>
              <interface-mode>TRUNK</interface-mode>
              <trunk-vlans>350..352</trunk-vlans>
              <native-vlan>351</native-vlan>
            </config>
          </switched-vlan>
        </ethernet>
      </interface>
```

```
    </interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure a native VLAN for a trunk VLAN interface.

```
interface xe7
 switchport
 dot1ad ethertype 0x8100
 bridge-group 1
 switchport mode trunk
 switchport trunk allowed vlan add 350-352
 switchport trunk native vlan 351
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure a native VLAN for a trunk VLAN interface.

```
        <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
          <interface>
            <name>xe7</name>
            <config>
              <name>xe7</name>
              <dot1ad-ether-type>0x8100</dot1ad-ether-type>
              <enable-switchport />
            </config>
            <port-vlan xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-port-
vlan">
              <switched-vlan>
                <interface-mode>trunk</interface-mode>
                <config>
                  <interface-mode>trunk</interface-mode>
                </config>
                <allowed-vlan>
                  <config>
                    <allowed-vlan-id>350-352</allowed-vlan-id>
                  </config>
                </allowed-vlan>
                <vlans>
                  <config>
                    <native-vlan-id>351</native-vlan-id>
                  </config>
                </vlans>
              </switched-vlan>
            </port-vlan>
          </interface>
        </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about native VLAN for trunk VLAN inerface.

```
        <interfaces xmlns="http://openconfig.net/yang/interfaces">
          <interface>
            <name>xe7</name>
            <config>
```

```
          <name>xe7</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe7</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <logical>false</logical>
          <last-change>318900</last-change>
          <oper-status>UP</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>5007</ifindex>
          <counters>
            <last-clear>1642442144</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>374</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>374</out-pkts>
            <out-octets>24068</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_1GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b8:6a:97:c3:64:44</hw-mac-address>
            <counters>
              <in-crc-errors>0</in-crc-errors>
              <in-jabber-frames>0</in-jabber-frames>
              <in-fragment-frames>0</in-fragment-frames>
              <in-oversize-frames>0</in-oversize-frames>
            </counters>
          </state>
          <switched-vlan xmlns="http://openconfig.net/yang/vlan">
            <config>
              <interface-mode>TRUNK</interface-mode>
              <native-vlan>351</native-vlan>
              <trunk-vlans>350..352</trunk-vlans>
            </config>
```

```
            <state>
              <interface-mode>TRUNK</interface-mode>
              <native-vlan>351</native-vlan>
              <trunk-vlans>350..352</trunk-vlans>
            </state>
          </switched-vlan>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

VLANs associated to trunk interface must also be created and bridge must be associated to the interface.

Access VLAN in interface

This XML configuration snippet is used to configure an access VLAN in an interface.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure an access VLAN in an interface.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
      <name>1</name>
      <config>
        <name>1</name>
        <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2L3</type>
        <bridge-protocol xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-
ni-augments">ieee-vlan-bridge</bridge-protocol>
      </config>
      <vlans>
        <vlan>
          <vlan-id>300</vlan-id>
          <config>
            <vlan-id>300</vlan-id>
            <status>ACTIVE</status>
          </config>
        </vlan>
      </vlans>
```

```
            <interfaces>
              <interface>
                <id>xe16</id>
                <config>
                  <interface>xe16</interface>
                  <id>xe16</id>
                </config>
              </interface>
            </interfaces>
    </network-instance>
</network-instances>
<interfaces xmlns="http://openconfig.net/yang/interfaces">
<interface>
<name>xe16</name>
<config>
<name>xe16</name>
<type
xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
</config>
<ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
<switched-vlan xmlns="http://openconfig.net/yang/vlan">
<config>
<interface-mode>ACCESS</interface-mode>
<access-vlan>300</access-vlan>
</config>
</switched-vlan>
</ethernet>
</interface>
</interfaces>
```

OcNOS CLI command

The below CLI command is used to configure an access VLAN in an interface.

```
interface xe16
switchport
bridge-group 1
switchport mode access
switchport access vlan 300
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure an access VLAN in an interface.

```
          <network-instance>
            <instance-name>1</instance-name>
            <instance-type>l2ni</instance-type>
            <bridge xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bridge">
              <config>
                <protocol>ieee-vlan-bridge</protocol>
              </config>
              <vlans xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vlan">
                <vlan>
                  <vlan-id>300</vlan-id>
                  <config>
```

```
                  <vlan-id>300</vlan-id>
                </config>
                <customer-vlan>
                  <config>
                    <state>enable</state>
                  </config>
                </customer-vlan>
              </vlan>
            </vlans>
            <bridge-ports>
              <interface>
                <name>xe16</name>
                <config>
                  <name>xe16</name>
                </config>
              </interface>
            </bridge-ports>
          </bridge>
          <config>
            <instance-name>1</instance-name>
            <instance-type>l2ni</instance-type>
          </config>
        </network-instance>
      </network-instances>
      <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
        <interface>
          <name>xe16</name>
          <config>
            <name>xe16</name>
            <enable-switchport />
          </config>
          <port-vlan xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-port-
vlan">
            <switched-vlan>
              <interface-mode>access</interface-mode>
              <config>
                <interface-mode>access</interface-mode>
              </config>
              <vlans>
                <config>
                  <vlan-id>300</vlan-id>
                </config>
              </vlans>
            </switched-vlan>
          </port-vlan>
        </interface>
      </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about configuring an access VLAN in an interface.

```
      <interfaces xmlns="http://openconfig.net/yang/interfaces">
        <interface>
          <name>xe16</name>
          <config>
```

```
          <name>xe16</name>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </config>
        <state>
          <name>xe16</name>
          <logical>false</logical>
          <last-change>557400</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>5016</ifindex>
          <counters>
            <last-clear>1642444529</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_10GB</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>b8:6a:97:c3:64:4d</hw-mac-address>
            <counters>
              <in-crc-errors>0</in-crc-errors>
              <in-jabber-frames>0</in-jabber-frames>
              <in-fragment-frames>0</in-fragment-frames>
              <in-oversize-frames>0</in-oversize-frames>
            </counters>
          </state>
          <switched-vlan xmlns="http://openconfig.net/yang/vlan">
            <config>
              <interface-mode>ACCESS</interface-mode>
              <access-vlan>300</access-vlan>
            </config>
            <state>
              <interface-mode>ACCESS</interface-mode>
              <access-vlan>300</access-vlan>
            </state>
```

```
          </switched-vlan>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
      </interface>
    </interfaces>
```

Restrictions

VLAN associated to access interface must also be created and bridge must be associated to the interface.

Trunk VLANs in link aggregation interface

This XML configuration snippet is used to configure a trunk VLAN range in a link aggregation interface.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure a trunk VLAN range in a link aggregation interface.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
      <name>1</name>
      <config>
        <name>1</name>
        <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2L3</type>
        <bridge-protocol xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-
ni-augments">ieee-vlan-bridge</bridge-protocol>
      </config>
      <fdb>
        <config>
          <mac-learning>true</mac-learning>
        </config>
      </fdb>
      <vlans>
        <vlan>
          <vlan-id>300</vlan-id>
<config>
  <vlan-id>300</vlan-id>
  <status>ACTIVE</status>
</config>
        </vlan>
      </vlans>
```

```
            <interfaces>
              <interface>
                <id>sa3</id>
                <config>
                  <interface>sa3</interface>
                  <id>sa3</id>
                </config>
              </interface>
            </interfaces>
    </network-instance>
</network-instances>
<interfaces xmlns="http://openconfig.net/yang/interfaces">
    <interface>
      <name>sa3</name>
      <config>
        <name>sa3</name>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
      </config>
      <aggregation xmlns="http://openconfig.net/yang/interfaces/aggregate">
        <switched-vlan xmlns="http://openconfig.net/yang/vlan">
          <config>
            <interface-mode>TRUNK</interface-mode>
            <trunk-vlans>300</trunk-vlans>
          </config>
        </switched-vlan>
        <config>
          <lag-type>STATIC</lag-type>
        </config>
      </aggregation>
    </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure a trunk VLAN range in a link aggregation interface.

```
interface sa3
 switchport
 bridge-group 1
 switchport mode trunk
 switchport trunk allowed vlan add 300
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure a trunk VLAN range in a link aggregation interface.

.

```
      <network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
network-instance">
        <network-instance>
          <instance-name>1</instance-name>
          <instance-type>l2ni</instance-type>
          <bridge xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bridge">
            <config>
              <protocol>ieee-vlan-bridge</protocol>
```

```
            </config>
            <vlans xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vlan">
              <vlan>
                <vlan-id>300</vlan-id>
                <config>
                  <vlan-id>300</vlan-id>
                </config>
                <customer-vlan>
                  <config>
                    <state>enable</state>
                  </config>
                </customer-vlan>
              </vlan>
            </vlans>
            <bridge-ports>
              <interface>
                <name>sa3</name>
                <config>
                  <name>sa3</name>
                </config>
              </interface>
            </bridge-ports>
          </bridge>
          <config>
            <instance-name>1</instance-name>
            <instance-type>l2ni</instance-type>
          </config>
        </network-instance>
      </network-instances>
      <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
        <interface>
          <name>sa3</name>
          <config>
            <name>sa3</name>
            <enable-switchport />
          </config>
          <port-vlan xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-port-
vlan">
            <switched-vlan>
              <interface-mode>trunk</interface-mode>
              <config>
                <interface-mode>trunk</interface-mode>
              </config>
              <allowed-vlan>
                <config>
                  <allowed-vlan-id>300</allowed-vlan-id>
                </config>
              </allowed-vlan>
            </switched-vlan>
          </port-vlan>
        </interface>
      </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about configuring trunk VLAN range in a link aggregation interface.

.

```
        <interfaces xmlns="http://openconfig.net/yang/interfaces">
          <interface>
            <name>sa3</name>
            <config>
              <name>sa3</name>
              <type
                xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
    type">ianaift:ieee8023adLag</type>
            </config>
            <state>
              <name>sa3</name>
              <logical>false</logical>
              <last-change>851000</last-change>
              <oper-status>DOWN</oper-status>
              <admin-status>UP</admin-status>
              <ifindex>200003</ifindex>
              <counters>
                <last-clear>1642447466</last-clear>
                <out-errors>0</out-errors>
                <out-discards>0</out-discards>
                <out-multicast-pkts>0</out-multicast-pkts>
                <out-broadcast-pkts>0</out-broadcast-pkts>
                <out-unicast-pkts>0</out-unicast-pkts>
                <out-pkts>0</out-pkts>
                <out-octets>0</out-octets>
                <in-fcs-errors>0</in-fcs-errors>
                <in-errors>0</in-errors>
                <in-discards>0</in-discards>
                <in-multicast-pkts>0</in-multicast-pkts>
                <in-broadcast-pkts>0</in-broadcast-pkts>
                <in-unicast-pkts>0</in-unicast-pkts>
                <in-pkts>0</in-pkts>
                <in-octets>0</in-octets>
              </counters>
              <type
                xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
    type">ianaift:ieee8023adLag</type>
            </state>
            <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
              <state>
                <negotiated-port-speed
                  xmlns:oc-eth="http://openconfig.net/yang/interfaces/
    ethernet">oc-eth:SPEED_UNKNOWN</negotiated-port-speed>
                <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
                <hw-mac-address>0e:00:00:00:00:01</hw-mac-address>
                <counters>
                  <in-crc-errors>0</in-crc-errors>
                  <in-jabber-frames>0</in-jabber-frames>
                  <in-fragment-frames>0</in-fragment-frames>
                  <in-oversize-frames>0</in-oversize-frames>
                </counters>
```

```
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
        <aggregation xmlns="http://openconfig.net/yang/interfaces/aggregate">
          <switched-vlan xmlns="http://openconfig.net/yang/vlan">
            <config>
              <interface-mode>TRUNK</interface-mode>
              <trunk-vlans>300</trunk-vlans>
            </config>
            <state>
              <interface-mode>TRUNK</interface-mode>
              <trunk-vlans>300</trunk-vlans>
            </state>
          </switched-vlan>
          <config>
            <lag-type>STATIC</lag-type>
          </config>
          <state>
            <lag-type>STATIC</lag-type>
          </state>
        </aggregation>
      </interface>
    </interfaces>
```

Restrictions

VLANs associated to trunk LAG must also be created and bridge must be associated to the LAG.

Trunk LAG with native VLAN

This XML configuration snippet is used to configure a native VLAN for a trunk VLAN link aggregation.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure a native VLAN for a trunk VLAN link aggregation.

```
    <network-instances xmlns="http://openconfig.net/yang/network-instance">
        <network-instance>
          <name>1</name>
          <config>
            <name>1</name>
```

```
        <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2L3</type>
        <bridge-protocol xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-
ni-augments">ieee-vlan-bridge</bridge-protocol>
      </config>
      <fdb>
        <config>
          <mac-learning>true</mac-learning>
        </config>
      </fdb>
      <vlans>
        <vlan>
          <vlan-id>300</vlan-id>
<config>
  <vlan-id>300</vlan-id>
  <status>ACTIVE</status>
</config>
        </vlan>
      </vlans>
           <interfaces>
             <interface>
               <id>po1</id>
               <config>
                 <interface>po1</interface>
                 <id>po1</id>
               </config>
             </interface>
           </interfaces>
    </network-instance>
</network-instances>
<interfaces xmlns="http://openconfig.net/yang/interfaces">
<interface>
      <name>po1</name>
      <config>
        <name>po1</name>
        <tpid xmlns="http://openconfig.net/yang/vlan">TPID_0X8100</tpid>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
      </config>
      <aggregation xmlns="http://openconfig.net/yang/interfaces/aggregate">
        <switched-vlan xmlns="http://openconfig.net/yang/vlan">
          <config>
            <interface-mode>TRUNK</interface-mode>
            <native-vlan>300</native-vlan>
            <trunk-vlans>300</trunk-vlans>
          </config>
        </switched-vlan>
        <config>
          <lag-type>LACP</lag-type>
        </config>
      </aggregation>
    </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure a native VLAN for a trunk VLAN link aggregation.

```
interface po1
 switchport
 dot1ad ethertype 0x8100
 bridge-group 1
 switchport mode trunk
 switchport trunk allowed vlan add 300
 switchport trunk native vlan 300
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure a native VLAN for a trunk VLAN link aggregation.

```
      <network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
network-instance">
        <network-instance>
          <instance-name>1</instance-name>
          <instance-type>l2ni</instance-type>
          <bridge xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bridge">
            <config>
              <protocol>ieee-vlan-bridge</protocol>
            </config>
            <vlans xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vlan">
              <vlan>
                <vlan-id>300</vlan-id>
                <config>
                  <vlan-id>300</vlan-id>
                </config>
                <customer-vlan>
                  <config>
                    <state>enable</state>
                  </config>
                </customer-vlan>
              </vlan>
            </vlans>
            <bridge-ports>
              <interface>
                <name>po1</name>
                <config>
                  <name>po1</name>
                </config>
              </interface>
            </bridge-ports>
          </bridge>
          <config>
            <instance-name>1</instance-name>
            <instance-type>l2ni</instance-type>
          </config>
        </network-instance>
      </network-instances>
      <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
        <interface>
          <name>po1</name>
          <config>
            <name>po1</name>
            <dot1ad-ether-type>0x8100</dot1ad-ether-type>
            <enable-switchport />
          </config>
```

```
          <port-vlan xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-port-
vlan">
            <switched-vlan>
              <interface-mode>trunk</interface-mode>
              <config>
                <interface-mode>trunk</interface-mode>
              </config>
              <vlans>
                <config>
                  <native-vlan-id>300</native-vlan-id>
                </config>
              </vlans>
              <allowed-vlan>
                <config>
                  <allowed-vlan-id>300</allowed-vlan-id>
                </config>
              </allowed-vlan>
            </switched-vlan>
          </port-vlan>
        </interface>
      </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about configuring a native VLAN for a trunk VLAN link aggregation.

```
    <interfaces xmlns="http://openconfig.net/yang/interfaces">
      <interface>
        <name>po1</name>
        <config>
          <name>po1</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
        </config>
        <state>
          <name>po1</name>
          <tpid xmlns="http://openconfig.net/yang/vlan" xmlns:oc-vlan-
types="http://openconfig.net/yang/vlan-types">oc-vlan-types:TPID_0X8100</tpid>
          <logical>false</logical>
          <last-change>897000</last-change>
          <oper-status>DOWN</oper-status>
          <admin-status>UP</admin-status>
          <ifindex>100001</ifindex>
          <counters>
            <last-clear>1642447926</last-clear>
            <out-errors>0</out-errors>
            <out-discards>0</out-discards>
            <out-multicast-pkts>0</out-multicast-pkts>
            <out-broadcast-pkts>0</out-broadcast-pkts>
            <out-unicast-pkts>0</out-unicast-pkts>
            <out-pkts>0</out-pkts>
            <out-octets>0</out-octets>
            <in-fcs-errors>0</in-fcs-errors>
```

```
            <in-errors>0</in-errors>
            <in-discards>0</in-discards>
            <in-multicast-pkts>0</in-multicast-pkts>
            <in-broadcast-pkts>0</in-broadcast-pkts>
            <in-unicast-pkts>0</in-unicast-pkts>
            <in-pkts>0</in-pkts>
            <in-octets>0</in-octets>
          </counters>
          <type
            xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ieee8023adLag</type>
        </state>
        <ethernet xmlns="http://openconfig.net/yang/interfaces/ethernet">
          <state>
            <negotiated-port-speed
              xmlns:oc-eth="http://openconfig.net/yang/interfaces/
ethernet">oc-eth:SPEED_UNKNOWN</negotiated-port-speed>
            <negotiated-duplex-mode>FULL</negotiated-duplex-mode>
            <hw-mac-address>0e:00:00:00:00:01</hw-mac-address>
            <counters>
              <in-crc-errors>0</in-crc-errors>
              <in-jabber-frames>0</in-jabber-frames>
              <in-fragment-frames>0</in-fragment-frames>
              <in-oversize-frames>0</in-oversize-frames>
            </counters>
          </state>
        </ethernet>
        <subinterfaces>
          <subinterface>
            <index>0</index>
            <config>
              <index>0</index>
            </config>
          </subinterface>
        </subinterfaces>
        <aggregation xmlns="http://openconfig.net/yang/interfaces/aggregate">
          <switched-vlan xmlns="http://openconfig.net/yang/vlan">
            <config>
              <interface-mode>TRUNK</interface-mode>
              <native-vlan>300</native-vlan>
              <trunk-vlans>300</trunk-vlans>
            </config>
            <state>
              <interface-mode>TRUNK</interface-mode>
              <native-vlan>300</native-vlan>
              <trunk-vlans>300</trunk-vlans>
            </state>
          </switched-vlan>
          <config>
            <lag-type>LACP</lag-type>
          </config>
          <state>
            <lag-type>LACP</lag-type>
          </state>
        </aggregation>
      </interface>
    </interfaces>
```

Restrictions

VLANs associated to trunk interface must also be created and bridge must be associated to the interface.

Creation of a cross connect

This XML configuration snippet is used to create a cross connect between 2 subinterfaces.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create a cross connect between 2 subinterfaces.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
      <name>test3</name>
      <config>
        <name>test3</name>
        <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">L2P2P</type>
<description>Test XConnection</description>
      </config>
      <interfaces>
        <interface>
          <id>xe7.10</id>
          <config>
            <id>xe7.10</id>
            <interface>xe7</interface>
            <subinterface>10</subinterface>
          </config>
        </interface>
        <interface>
          <id>xe8.20</id>
          <config>
            <id>xe8.20</id>
            <interface>xe8</interface>
            <subinterface>20</subinterface>
          </config>
        </interface>
      </interfaces>
    </network-instance>
</network-instances>
  <interfaces xmlns="http://openconfig.net/yang/interfaces">
    <interface>
      <name>xe7</name>
      <config>
        <name>xe7</name>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
      </config>
```

```
      <subinterfaces>
        <subinterface>
          <index>10</index>
          <config>
            <index>10</index>
          </config>
          <vlan xmlns="http://openconfig.net/yang/vlan">
            <match>
              <single-tagged-list>
                <config>
                  <vlan-ids>10</vlan-ids>
                </config>
              </single-tagged-list>
            </match>
          </vlan>
        </subinterface>
      </subinterfaces>
    </interface>
    <interface>
      <name>xe8</name>
      <config>
        <name>xe8</name>
        <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
      </config>
      <subinterfaces>
        <subinterface>
          <index>20</index>
          <config>
            <index>20</index>
          </config>
          <vlan xmlns="http://openconfig.net/yang/vlan">
            <match>
              <single-tagged-list>
                <config>
                  <vlan-ids>10</vlan-ids>
                </config>
              </single-tagged-list>
            </match>
          </vlan>
        </subinterface>
      </subinterfaces>
    </interface>
  </interfaces>
```

OcNOS CLI Command

The below CLI command is used to create a cross connect between 2 subinterfaces.

```
interface xe7.10 switchport
 encapsulation dot1q 10
!
interface xe8.20 switchport
 encapsulation dot1q 10
!
cross-connect test3
 description Test XConnection
```

```
 interface xe7.10
 interface xe8.20
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create a cross connect between 2 subinterfaces.

```
<network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">
  <network-instance>
    <instance-name>test3</instance-name>
    <instance-type>cross-connect</instance-type>
    <config>
      <instance-name>test3</instance-name>
      <instance-type>cross-connect</instance-type>
    </config>
    <cross-connect xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-cross-
connect">
      <config>
        <xc-name>test3</xc-name>
        <description>Test XConnection</description>
      </config>
      <cross-connect-interfaces>
        <cross-connect-interface>
          <endpoint-if>eth7.10</endpoint-if>
          <config>
            <endpoint-if>eth7.10</endpoint-if>
          </config>
        </cross-connect-interface>
        <cross-connect-interface>
          <endpoint-if>eth8.20</endpoint-if>
          <config>
            <endpoint-if>eth8.20</endpoint-if>
          </config>
        </cross-connect-interface>
      </cross-connect-interfaces>
    </cross-connect>
  </network-instance>
</network-instances>
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
  <interface>
    <name>eth7.10</name>
    <config>
      <name>eth7.10</name>
      <enable-switchport/>
    </config>
    <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-extended">
      <subinterface-encapsulation>
        <single-tag-vlan-matches>
          <single-tag-vlan-match>
            <encapsulation-type>dot1q</encapsulation-type>
            <config>
              <encapsulation-type>dot1q</encapsulation-type>
              <outer-vlan-id>10</outer-vlan-id>
            </config>
          </single-tag-vlan-match>
```

```
          </single-tag-vlan-matches>
        </subinterface-encapsulation>
      </extended>
    </interface>
    <interface>
      <name>eth8.20</name>
      <config>
        <name>eth8.20</name>
        <enable-switchport/>
      </config>
      <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-extended">
        <subinterface-encapsulation>
          <single-tag-vlan-matches>
            <single-tag-vlan-match>
              <encapsulation-type>dot1q</encapsulation-type>
              <config>
                <encapsulation-type>dot1q</encapsulation-type>
                <outer-vlan-id>10</outer-vlan-id>
              </config>
            </single-tag-vlan-match>
          </single-tag-vlan-matches>
        </subinterface-encapsulation>
      </extended>
    </interface>
  </interfaces>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information on creating a cross connect between 2 subinterfaces.

```
      <network-instances xmlns="http://openconfig.net/yang/network-instance">
        <network-instance>
          <name>test3</name>
          <config>
            <name>test3</name>
            <type
              xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2P2P</type>
            <description>Test XConnection</description>
          </config>
          <state>
            <name>test3</name>
            <type
              xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2P2P</type>
            <description>Test XConnection</description>
          </state>
          <interfaces>
            <interface>
              <id>xe7.10</id>
              <config>
                <id>xe7.10</id>
                <interface>xe7</interface>
                <subinterface>10</subinterface>
              </config>
              <state>
```

```
            <id>xe7.10</id>
            <interface>xe7</interface>
            <subinterface>10</subinterface>
          </state>
        </interface>
        <interface>
          <id>xe8.20</id>
          <config>
            <id>xe8.20</id>
            <interface>xe8</interface>
            <subinterface>20</subinterface>
          </config>
          <state>
            <id>xe8.20</id>
            <interface>xe8</interface>
            <subinterface>20</subinterface>
          </state>
        </interface>
      </interfaces>
    </network-instance>
  </network-instances>
```

Restrictions

- Exactly 2 subinterfaces must be configured along with network-instance creation.
- The old path for Open Config `/network-instances/network-instance/config/enabled` is not supported after Open Config v1.0.0, and without this path the Cross-Connect feature is lost in the translation for IPI path `/network-instances/network-instance/cross-connect/config/admin-disable`.

Deletion of a cross connect

This XML configuration snippet is used to delete a cross connect.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to delete a cross connect.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
   <network-instance operation="delete">
      <name>test3</name>
   </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to delete a cross connect.

```
OcNOS#configure terminal
```

```
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#no cross-connect test3
OcNOS(config)#commit
OcNOS#show running-config cross-connect
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to delete a cross connect.

```
      <network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
network-instance">
        <network-instance operation="delete">
          <instance-name>test3</instance-name>
          <instance-type>cross-connect</instance-type>
        </network-instance>
      </network-instances>
```

Validation with NetConf get

Here is a NetConf validation response that provides information on deleting a cross connect.

```
 <data/>
```

Restrictions

None

Configure Bridge Domain and associate L2 Subinterfaces

This XML configuration snippet is used to configure L2 Subinterface and attach to Bridge Domain.

Note: The subinterfaces are set to L2 implicitly by Bridge Domain instance translation. As a result, the subinterfaces must either be created in the same transaction as Bridge Domain or created as L2 from CLI or IPI datamodel. If the subinterfaces are created as L3, this would result in error while assiging them to a Bridge Domain instance.

Release

This configuration was introduced in OcNOS version 6.4.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure L2 Subinterface and attach to Bridge Domain.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>1</name>
    <config>
      <name>1</name>
      <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">L2VSI</type>
      <description>Test Bridge Domain</description>
    </config>
```

```
    <interfaces>
      <interface>
        <id>xe9.10</id>
        <config>
          <id>xe9.10</id>
          <interface>xe9</interface>
          <subinterface>10</subinterface>
        </config>
      </interface>
      <interface>
        <id>xe10.20</id>
        <config>
          <id>xe10.20</id>
          <interface>xe10</interface>
          <subinterface>20</subinterface>
        </config>
      </interface>
    </interfaces>
  </network-instance>
</network-instances>
<interfaces xmlns="http://openconfig.net/yang/interfaces">
  <interface>
    <name>xe9</name>
    <config>
      <name>xe9</name>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
    <subinterfaces>
      <subinterface>
        <index>10</index>
        <config>
          <index>10</index>
        </config>
        <vlan xmlns="http://openconfig.net/yang/vlan">
          <match>
            <single-tagged-list>
              <config>
                <vlan-ids>10</vlan-ids>
              </config>
            </single-tagged-list>
          </match>
        </vlan>
      </subinterface>
    </subinterfaces>
  </interface>
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
      <type xmlns:ianaift="urn:ietf:params:xml:ns:yang:iana-if-
type">ianaift:ethernetCsmacd</type>
    </config>
    <subinterfaces>
      <subinterface>
        <index>20</index>
        <config>
```

```
          <index>20</index>
        </config>
        <vlan xmlns="http://openconfig.net/yang/vlan">
          <match>
            <single-tagged-list>
              <config>
                <vlan-ids>10</vlan-ids>
              </config>
            </single-tagged-list>
          </match>
        </vlan>
      </subinterface>
    </subinterfaces>
  </interface>
</interfaces>
```

OcNOS CLI Command

The below CLI command is used to configure L2 Subinterface and attach to Bridge Domain.

```
interface xe9.10 switchport
 encapsulation dot1q 10
!
interface xe10.20 switchport
 encapsulation dot1q 10
!
bridge-domain 1
 description Test Bridge Domain
 interface xe9.10
 interface xe10.20
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure L2 Subinterface and attach to Bridge Domain.

```
<network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">
  <network-instance>
    <instance-name>1</instance-name>
    <instance-type>bridge-domain</instance-type>
    <config>
      <instance-name>1</instance-name>
      <instance-type>bridge-domain</instance-type>
    </config>
    <bridge-domain xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bridge-
domain">
      <config>
        <domain-id>1</domain-id>
        <description>Test Bridge Domain</description>
        <member-interfaces>xe9.10</member-interfaces>
        <member-interfaces>xe10.20</member-interfaces>
      </config>
    </bridge-domain>
  </network-instance>
</network-instances>
<interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-interface">
```

```
  <interface>
    <name>xe9.10</name>
    <config>
      <enable-switchport/>
      <name>xe9.10</name>
    </config>
    <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-extended">
      <subinterface-encapsulation>
        <single-tag-vlan-matches>
          <single-tag-vlan-match>
            <encapsulation-type>dot1q</encapsulation-type>
            <config>
              <encapsulation-type>dot1q</encapsulation-type>
              <outer-vlan-id>10</outer-vlan-id>
            </config>
          </single-tag-vlan-match>
        </single-tag-vlan-matches>
      </subinterface-encapsulation>
    </extended>
  </interface>
  <interface>
    <name>xe10.20</name>
    <config>
      <enable-switchport/>
      <name>xe10.20</name>
    </config>
    <extended xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-if-extended">
      <subinterface-encapsulation>
        <single-tag-vlan-matches>
          <single-tag-vlan-match>
            <encapsulation-type>dot1q</encapsulation-type>
            <config>
              <encapsulation-type>dot1q</encapsulation-type>
              <outer-vlan-id>10</outer-vlan-id>
            </config>
          </single-tag-vlan-match>
        </single-tag-vlan-matches>
      </subinterface-encapsulation>
    </extended>
  </interface>
  <interface>
    <name>xe9</name>
    <config>
      <name>xe9</name>
    </config>
  </interface>
  <interface>
    <name>xe10</name>
    <config>
      <name>xe10</name>
    </config>
  </interface>
</interfaces>
```

Restrictions

Bridge Domain instance name must be an integer in the range `1-2147483647`.

Deletion of a Bridge Domain instance

This XML configuration snippet is used to delete a Bridge Domain instance.

Release

This configuration was introduced in OcNOS version 6.4.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to delete a Bridge Domain instance.

```
<network-instances xmlns="<http://openconfig.net/yang/network-instance">>
  <network-instance operation="delete">
    <name>1</name>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI is used to delete a Bridge Domain instance.

```
OcNOS#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#no bridge-domain 1
OcNOS(config)#commit
OcNOS#show running-config bridge-domain
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to delete a Bridge Domain instance.

```
<network-instances xmlns="<http://www.ipinfusion.com/yang/ocnos/ipi-network-
instance">>
  <network-instance operation="delete">
    <instance-name>1</instance-name>
    <instance-type>bridge-domain</instance-type>
  </network-instance>
</network-instances>
```

Validation with NetConf get

Here is a NetConf validation response that provides information about deletion of a Bridge Domain instance.

```
<data/>
```

Restrictions

None

Creation of a VLAN bridge

This XML configuration snippet is used to create a VLAN bridge and assign VLANs to it.

Release

This configuration was introduced in OcNOS version 5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create a VLAN bridge and assign VLANs to it.

```
  <network-instances xmlns="http://openconfig.net/yang/network-instance">
    <network-instance>
      <name>1</name>
      <config>
        <name>1</name>
        <type xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2L3</type>
      </config>
      <vlans>
        <vlan>
          <vlan-id>401</vlan-id>
            <config>
              <vlan-id>401</vlan-id>
  <name>VLAN-401</name>
              <status>ACTIVE</status>
            </config>
        </vlan>
        <vlan>
          <vlan-id>501</vlan-id>
            <config>
              <vlan-id>501</vlan-id>
  <name>VLAN-501</name>
              <status>ACTIVE</status>
            </config>
        </vlan>
      </vlans>
    </network-instance>
  </network-instances>
```

OcNOS CLI Command

The below CLI command is used to create a VLAN bridge and assign VLANs to it.

```
bridge 1 protocol ieee vlan-bridge
!
vlan database
 vlan 401 bridge 1 name VLAN-401 state enable
```

```
 vlan 501 bridge 1 name VLAN-501 state enable
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create a VLAN bridge and assign VLANs to it.

```
       <network-instances xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
network-instance">
        <network-instance>
          <instance-name>1</instance-name>
          <instance-type>l2ni</instance-type>
          <bridge xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bridge">
            <config>
              <protocol>ieee-vlan-bridge</protocol>
            </config>
            <vlans xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-vlan">
              <vlan>
                <vlan-id>401</vlan-id>
                <config>
                  <vlan-id>401</vlan-id>
                </config>
                <customer-vlan>
                  <config>
                    <name>VLAN-401</name>
                    <state>enable</state>
                  </config>
                </customer-vlan>
              </vlan>
              <vlan>
                <vlan-id>501</vlan-id>
                <config>
                  <vlan-id>501</vlan-id>
                </config>
                <customer-vlan>
                  <config>
                    <name>VLAN-501</name>
                    <state>enable</state>
                  </config>
                </customer-vlan>
              </vlan>
            </vlans>
          </bridge>
          <config>
            <instance-name>1</instance-name>
            <instance-type>l2ni</instance-type>
          </config>
        </network-instance>
      </network-instances>
```

Validation with NetConf get

Here is a NetConf validation response that provides information about creating a VLAN bridge and assigning VLANs.

```
       <network-instances xmlns="http://openconfig.net/yang/network-instance">
        <network-instance>
          <name>1</name>
```

```
        <config>
          <name>1</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2L3</type>
          <bridge-protocol xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-oc-
ni-augments">ieee-vlan-bridge</bridge-protocol>
        </config>
        <state>
          <name>1</name>
          <type
            xmlns:oc-ni-types="http://openconfig.net/yang/network-instance-
types">oc-ni-types:L2L3</type>
        </state>
        <fdb>
          <config>
            <mac-learning>true</mac-learning>
          </config>
        </fdb>
        <vlans>
          <vlan>
            <vlan-id>401</vlan-id>
            <config>
              <vlan-id>401</vlan-id>
              <name>VLAN-401</name>
              <status>ACTIVE</status>
            </config>
            <state>
              <vlan-id>401</vlan-id>
              <name>VLAN-401</name>
              <status>ACTIVE</status>
            </state>
          </vlan>
          <vlan>
            <vlan-id>501</vlan-id>
            <config>
              <vlan-id>501</vlan-id>
              <name>VLAN-501</name>
              <status>ACTIVE</status>
            </config>
            <state>
              <vlan-id>501</vlan-id>
              <name>VLAN-501</name>
              <status>ACTIVE</status>
            </state>
          </vlan>
        </vlans>
      </network-instance>
    </network-instances>
```

Restrictions

The network-instance used for bridge must have a name being a number between 1 and 32.

LLDP OpenConfig Translation

Enable Management Attributes

This XML configuration snippet is used to enable LLDP and all the management TLV attributes.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to enable LLDP and all the management TLV attributes.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
  <config>
    <enabled>true</enabled>
  </config>
</lldp>
```

OcNOS CLI command

The below CLI command is used to enable LLDP and all the management TLV attributes.

```
lldp run
lldp tlv-select basic-mgmt port-description
lldp tlv-select basic-mgmt system-name
lldp tlv-select basic-mgmt system-capabilities
lldp tlv-select basic-mgmt system-description
lldp tlv-select basic-mgmt management-address
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to enable LLDP and all the management TLV attributes.

```
  <lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
<global>
  <global-tlv-control>
    <global-basic-management>
      <config>
        <port-description>true</port-description>
        <management-address>true</management-address>
        <system-capabilities>true</system-capabilities>
        <system-description>true</system-description>
        <system-name>true</system-name>
      </config>
    </global-basic-management>
  </global-tlv-control>
```

```
      <config>
        <enable>true</enable>
      </config>
    </global>
  </lldp>
```

Validation with NETCONF get

Here is a NetConf validation response that provides detailed information about enabling LLDP and all the management TLV attributes.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
  <config>
    <enabled>true</enabled>
  </config>
  <state>
    <enabled>true</enabled>
    <counters>
      <entries-aged-out>0</entries-aged-out>
      <frame-discard>0</frame-discard>
      <frame-out>0</frame-out>
      <frame-in>0</frame-in>
    </counters>
    <system-name>OcNOS</system-name>
  </state>
</lldp>
```

Restrictions

None

Configure chassis-id

This XML configuration snippet is used to set the locally assigned chassis name for the LLDP interface.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to set the locally assigned chassis name for the LLDP interface.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
  <config>
    <chassis-id>host7028_AS5912-54X</chassis-id>
  </config>
</lldp>
```

OcNOS CLI command

The below CLI command is used to set the locally assigned chassis name for the LLDP interface.

```
set lldp chassis locally-assigned host7028_AS5912-54X
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to set the locally assigned chassis name for the LLDP interface.

```
          <lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
          <global>
            <management-if>
              <config>
                <locally-assigned-chassis-id>host7028_AS5912-54X</locally-
assigned-chassis-id>
              </config>
            </management-if>
          </global>
        </lldp>
```

Validation with NETCONF get

Here is a NetConf validation response that provides detailed information about setting the locally assigned chassis name for the LLDP interface.

```
      <lldp xmlns="http://openconfig.net/yang/lldp">
        <config>
          <enabled>true</enabled>
          <chassis-id>host7028_AS5912-54X</chassis-id>
          <chassis-id-type>MAC_ADDRESS</chassis-id-type>
        </config>
        <state>
          <enabled>true</enabled>
          <counters>
            <entries-aged-out>0</entries-aged-out>
            <frame-discard>0</frame-discard>
            <frame-out>0</frame-out>
            <frame-in>0</frame-in>
          </counters>
          <system-name>OcNOS</system-name>
          <chassis-id>host7028_AS5912-54X</chassis-id>
          <chassis-id-type>MAC_ADDRESS</chassis-id-type>
        </state>
      </lldp>
```

Restrictions

The chassis type MAC_ADDRESS is fixed and assumed by default.

Configure suppress advertisement

This XM configuration snippet is used to configure suppress TLV advertisement for one or more attributes.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to configure suppress TLV advertisement for one or more attributes.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
<config>
<suppress-tlv-advertisement>SYSTEM_DESCRIPTION</suppress-tlv-advertisement>
</config>
</lldp>
```

OcNOS CLI command

The below CLI command is used to configure suppress TLV advertisement for one or more attributes.

```
no lldp tlv-select basic-mgmt system-description
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to configure suppress TLV advertisement for one or more attributes.

```
        <lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
          <global>
            <global-tlv-control>
              <global-basic-management>
                <config>
                  <system-description>false</system-description>
                </config>
              </global-basic-management>
            </global-tlv-control>
          </global>
        </lldp>
```

Validation with NETCONF get

Here is a NetConf validation response that provides detailed information about configuring suppress TLV advertisement for one or more attributes

```
        <lldp xmlns="http://openconfig.net/yang/lldp">
        <config>
          <enabled>true</enabled>
          <suppress-tlv-advertisement
            xmlns:oc-lldp-types="http://openconfig.net/yang/lldp/types">oc-lldp-
types:SYSTEM_DESCRIPTION</suppress-tlv-advertisement>
          <chassis-id>host7028_AS5912-54X</chassis-id>
          <chassis-id-type>MAC_ADDRESS</chassis-id-type>
        </config>
        <state>
          <enabled>true</enabled>
          <counters>
            <entries-aged-out>0</entries-aged-out>
            <frame-discard>0</frame-discard>
            <frame-out>0</frame-out>
            <frame-in>0</frame-in>
          </counters>
          <suppress-tlv-advertisement
```

```
          xmlns:oc-lldp-types="http://openconfig.net/yang/lldp/types">oc-lldp-
types:SYSTEM_DESCRIPTION</suppress-tlv-advertisement>
        <system-name>OcNOS</system-name>
        <chassis-id>host7028_AS5912-54X</chassis-id>
        <chassis-id-type>MAC_ADDRESS</chassis-id-type>
      </state>
    </lldp>
```

Restrictions

By default, all basic tlvs are disabled and can be configured using this leaf. The default behavior is 'suppressed', so this leaf-list will only show up if at least one advertisement is enabled.

As OpenConfig and OcNOS have a reverse logic for the TLV (suppress vs enable), when the suppress is present on OpenConfig, the translation forces deletion of the attribute on the Ocnos side. This is equivalent to deleting a configuration that does not exist, in which case, an error may be returned.

Configure system name

This XMl configuration snippet is used to configure the system-name (hostname).

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to configure the system-name (hostname).

```
<lldp xmlns="http://openconfig.net/yang/lldp">
<config>
<system-name>host7028</system-name>
</config>
</lldp>
```

OcNOS CLI command

This CLI command is used to configure the system-name (hostname).

```
hostname host7028
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to configure the system-name (hostname).

```
        <system-info xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-system">
          <config>
            <hostname>host7028</hostname>
          </config>
        </system-info>
```

Validation with NETCONF get

Here is a NetConf validation response that provides detailed information about configuring the system name (hostname).

Filter:

```
<get xmlns="urn:ietf:params:xml:ns:NETCONF:base:1.0">
  <filter type="subtree">
    <system-info xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-system">
      <config>
        <hostname />
      </config>
    </system-info>
  </filter>
</get>
```

Result:

```
  <system xmlns="http://openconfig.net/yang/system">
    <config>
      <hostname>host7028</hostname>
    </config>
  </system>
```

Restrictions

The configuration is same as system hostname, so both are modified when applied.

The same restrictions as for system hostname apply:
Per RFC 952 and RFC 1123, a hostname string can contain only the special characters period (“.”) and hyphen (“-”). These special characters cannot be at the start or end of a hostname. The number of characters in the hostname must be between 1 and 63 characters.

Enable LLDP on an interface

This XML configuration snippet is used to enable LLDP on an interface.

Release

This configuration was introduced in OcNOS version 5.0.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to enable LLDP on an interface.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
<interfaces>
<interface>
<name>xe10</name>
<config>
<enabled>true</enabled>
</config>
</interface>
```

```
</interfaces>
</lldp>
```

OcNOS CLI command

The blow CLI command is used to enable LLDP on an interface.

```
interface xe10
 lldp-agent
  set lldp enable txrx
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to enable LLDP on an interface.

```
<lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
  <interfaces>
    <interface>
      <name>xe10</name>
      <agent>
        <agent-type>default</agent-type>
        <config>
          <enable-tx-rx>txrx</enable-tx-rx>
          <agent-type>default</agent-type>
        </config>
      </agent>
    </interface>
  </interfaces>
</lldp>
```

Validation with NETCONF get

Here is a NetConf validation response that provides detailed information about enabling LLDP on an interface.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
  <interfaces>
    <interface>
      <name>xe10</name>
      <config>
        <name>xe10</name>
        <enabled>true</enabled>
      </config>
    </interface>
  </interfaces>
</lldp>
```

Restrictions

When enabled = true, the configuration mode is tx-rx in OcNOS. When enabled = false, the OcNOS mode is set as rx-only.

LLDP get Attributes

The following attributes are read-only (runtime) for LLDP.

Counters

This command is used to display LLDP counters.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter>
<lldp xmlns="http://openconfig.net/yang/lldp">
<state>
<counters/>
</state>
</lldp>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
  <state>
    <enabled>true</enabled>
    <counters>
      <entries-aged-out>0</entries-aged-out>
      <frame-discard>0</frame-discard>
      <frame-out>0</frame-out>
      <frame-in>1</frame-in>
    </counters>
  </state>
</lldp>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
<lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
  <global>
    <state>
      <counters>
        <remote-ageouts>0</remote-ageouts>
        <remote-drops>0</remote-drops>
        <remote-deletes>0</remote-deletes>
        <remote-inserts>1</remote-inserts>
      </counters>
    </state>
  </global>
</lldp>
```

Restrictions

Only the counters remote-ageouts, remote-drops, remote-deletes, and remote-inserts are supported.

Interface counters

This command is used to display LLDP interface counters.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter>///<lldp xmlns="http://openconfig.net/yang/lldp">
<interfaces>
<interface>
<name>ce50</name>
<state>
<counters/>
</state>
</interface>
</interfaces>
</lldp>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
  <interfaces>
    <interface>
      <name>xe1</name>
      <config>
        <name>xe1</name>
      </config>
      <state>
        <counters>
          <frame-out>14</frame-out>
        </counters>
      </state>
    </interface>
  </interfaces>
</lldp>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
<lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
  <interfaces>
    <interface>
      <name>xe1</name>
      <agent>
        <agent-type>default</agent-type>
        <transmit>
          <state>
            <tx-fast-init>2</tx-fast-init>
            <tx-credit-max>9</tx-credit-max>
```

```
                <message-fast-tx>222</message-fast-tx>
                <message-tx-hold-multiplier>88</message-tx-hold-multiplier>
                <message-tx-interval>999</message-tx-interval>
                <reinit-delay>6</reinit-delay>
                <tx-ttl>65535</tx-ttl>
                <counters>
                  <frames-out>14</frames-out>
                </counters>
              </state>
            </transmit>
          </agent>
        </interface>
      </interfaces>
    </lldp>
```

Restrictions

Only the counter frame-out is supported.

Neighbors

This command is used to display neighbors.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter>
<lldp xmlns="http://openconfig.net/yang/lldp">
<interfaces>
<interface>
<name>ce50</name>
<neighbors>
<neighbor>
</neighbor>
</neighbors>
</interface>
</interfaces>
</lldp>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
  <interfaces>
    <interface>
      <name>xe1</name>
      <config>
        <name>xe1</name>
      </config>
      <neighbors>
        <neighbor>
```

```
            <id>b86a.97be.193e</id>
            <state><id>b86a.97be.193e</id><system-description>Hardware
Model:EC_AS5912-54X</system-description>1<ttl>121</ttl><port-id-
type>MAC_ADDRESS</port-id-type><port-description>xe1</port-description><port-
id>b86a.97be.193e</port-id><chassis-id-type>NETWORK_ADDRESS</chassis-id-
type><chassis-id>10.12.89.136</chassis-id><system-name>7031</system-
name><management-address>b86a.97a7.253c</management-address><management-
address-type>MAC Address</management-address-type></state>
            <capabilities xmlns:oc-lldp-types="http://openconfig.net/yang/
lldp/types">
              <capability>
                <name>oc-lldp-types:MAC_BRIDGE</name>
                <state>
                  <name>oc-lldp-types:MAC_BRIDGE</name>
                  <enabled>true</enabled>
                </state>
              </capability>
              <capability>
                <name>oc-lldp-types:ROUTER</name>
                <state>
                  <name>oc-lldp-types:ROUTER</name>
                  <enabled>true</enabled>
                </state>
              </capability>
            </capabilities>
            <custom-tlvs>
              <tlv>
                <type>127</type>
                <oui>00-12-0F</oui>
                <oui-subtype>4</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-12-0F</oui>
                  <oui-subtype>4</oui-subtype>
                  <value>1518</value>
                </state>
              </tlv>
              <tlv>
                <type>127</type>
                <oui>00-12-0F</oui>
                <oui-subtype>1</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-12-0F</oui>
                  <oui-subtype>1</oui-subtype>
                  <value>11654</value>
                </state>
              </tlv>
              <tlv>
                <type>127</type>
                <oui>00-80-C2</oui>
                <oui-subtype>2</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-80-C2</oui>
                  <oui-subtype>2</oui-subtype>
                  <value>0</value>
                </state>
```

```
              </tlv>
              <tlv>
                <type>127</type>
                <oui>00-80-C2</oui>
                <oui-subtype>1</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-80-C2</oui>
                  <oui-subtype>1</oui-subtype>
                  <value>0</value>
                </state>
              </tlv>
            </custom-tlvs>
          </neighbor>
        </neighbors>
      </interface>
    </interfaces>
  </lldp>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
    <lldp xmlns="http://openconfig.net/yang/lldp">
      <interfaces>
        <interface>
          <name>xe1</name>
          <config>
            <name>xe1</name>
          </config>
          <neighbors>
            <neighbor>
              <id>b86a.97be.193e</id>
              <state><id>b86a.97be.193e</id><system-description>Hardware
Model:EC_AS5912-54X</system-description>1<ttl>121</ttl><port-id-
type>MAC_ADDRESS</port-id-type><port-description>xe1</port-description><port-
id>b86a.97be.193e</port-id><chassis-id-type>NETWORK_ADDRESS</chassis-id-
type><chassis-id>10.12.89.136</chassis-id><system-name>7031</system-
name><management-address>b86a.97a7.253c</management-address><management-
address-type>MAC Address</management-address-type></state>
              <capabilities xmlns:oc-lldp-types="http://openconfig.net/yang/
lldp/types">
                <capability>
                  <name>oc-lldp-types:MAC_BRIDGE</name>
                  <state>
                    <name>oc-lldp-types:MAC_BRIDGE</name>
                    <enabled>true</enabled>
                  </state>
                </capability>
                <capability>
                  <name>oc-lldp-types:ROUTER</name>
                  <state>
                    <name>oc-lldp-types:ROUTER</name>
                    <enabled>true</enabled>
                  </state>
                </capability>
              </capabilities>
              <custom-tlvs>
```

```
            <tlv>
              <type>127</type>
              <oui>00-12-0F</oui>
              <oui-subtype>4</oui-subtype>
              <state>
                <type>127</type>
                <oui>00-12-0F</oui>
                <oui-subtype>4</oui-subtype>
                <value>1518</value>
              </state>
            </tlv>
            <tlv>
              <type>127</type>
              <oui>00-12-0F</oui>
              <oui-subtype>1</oui-subtype>
              <state>
                <type>127</type>
                <oui>00-12-0F</oui>
                <oui-subtype>1</oui-subtype>
                <value>11654</value>
              </state>
            </tlv>
            <tlv>
              <type>127</type>
              <oui>00-80-C2</oui>
              <oui-subtype>2</oui-subtype>
              <state>
                <type>127</type>
                <oui>00-80-C2</oui>
                <oui-subtype>2</oui-subtype>
                <value>0</value>
              </state>
            </tlv>
            <tlv>
              <type>127</type>
              <oui>00-80-C2</oui>
              <oui-subtype>1</oui-subtype>
              <state>
                <type>127</type>
                <oui>00-80-C2</oui>
                <oui-subtype>1</oui-subtype>
                <value>0</value>
              </state>
            </tlv>
          </custom-tlvs>
        </neighbor>
      </neighbors>
    </interface>
  </interfaces>
</lldp>
```

Neighbors name and description

This command is used to display neighbors' name and description.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter>
<lldp xmlns="http://openconfig.net/yang/lldp">
<interfaces>
<interface>
<neighbors>
<neighbor>
<name>ce50</name>
<state>
<system-name/>
<description/>
<id/>
<ttl/>
</state>
</neighbor>
</neighbors>
</interface>
</interfaces>
</lldp>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
    <lldp xmlns="http://openconfig.net/yang/lldp">
     <interfaces>
       <interface>
         <name>eth0</name>
         <config>
           <name>eth0</name>
         </config>
         <neighbors>
           <neighbor>
             <id>08f1.ea53.dbf2</id>
             <state>
               <id>08f1.ea53.dbf2</id>
               <system-description>HPE OfficeConnect Switch 1920S 24G 2SFP
JL381A  PD.01.05  Linux 3.6.5-ac96795c  U-Boot 2012.10-00118-g3773021 (Oct 11
2016 - 15:39:54)</system-description>
               <system-name>LAB1-SW13</system-name>
             </state>
           </neighbor>
         </neighbors>
       </interface>
       <interface>
         <name>xe2</name>
         <config>
           <name>xe2</name>
         </config>
         <neighbors>
           <neighbor>
             <id>b86a.97be.193f</id>
             <state>
```

```
              <id>b86a.97be.193f</id>
              <system-description>Hardware Model:EC_AS5912-54X</system-
description>
              <system-name>7031</system-name>
            </state>
          </neighbor>
        </neighbors>
      </interface>
      <interface>
        <name>xe1</name>
        <config>
          <name>xe1</name>
        </config>
        <neighbors>
          <neighbor>
            <id>b86a.97be.193e</id>
            <state>
              <id>b86a.97be.193e</id>
              <system-description>Hardware Model:EC_AS5912-54X</system-
description>
              <system-name>7031</system-name>
            </state>
          </neighbor>
        </neighbors>
      </interface>
    </interfaces>
  </lldp>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
<lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
  <interfaces>
    <interface>
      <name>xe1</name>
      <neighbors>
        <agent>
          <agent-type>default</agent-type>
          <neighbor>
            <mac-address>b86a.97be.193e</mac-address>
            <state>
              <mac-address>b86a.97be.193e</mac-address>
             <system-capabilties-enabled>Bridge  Router</system-capabilties-enabled>
              <system-capabilties>Bridge  Router</system-capabilties>
              <system-description>Hardware Model:EC_AS5912-54X</system-description>
              <max-frame-size>1518</max-frame-size>
              <link-aggregate-capability>Capable</link-aggregate-capability>
              <operational-mau-type>54</operational-mau-type>
              <auto-negotiation-capability>16</auto-negotiation-capability>
              <auto-negotiation-support>1</auto-negotiation-support>
              <management-vlan>0</management-vlan>
              <vid-usage-digest>0</vid-usage-digest>
```

```
                <pp-vlanid>0</pp-vlanid>
                <port-vlan-id>0</port-vlan-id>
                <ttl>121</ttl>
                <port-sub-type>3</port-sub-type>
                <port-description>xe1</port-description>
                <port-id>b86a.97be.193e</port-id>
                <chassis-id-type>5</chassis-id-type>
                <chassis-component>10.12.89.136</chassis-component>
                <system-name>7031</system-name>
                <management-list>
                  <address>b86a.97a7.253c</address>
                  <oid>0</oid>
                  <interface-number>10001</interface-number>
                  <interface-number-sub-type>ifindex</interface-number-sub-type>
                  <address-sub-type>MAC Address</address-sub-type>
                </management-list>
              </state>
            </neighbor>
          </agent>
        </neighbors>
      </interface>
    </interfaces>
  </lldp>
```

Neighbors chassis-id, type and ttl

This command is used to display neighbors' chassis-id, type and ttl.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter>
<lldp xmlns="http://openconfig.net/yang/lldp">
<interfaces>
<interface>
<neighbors>
<neighbor>
<name>ce50</name>
<state>
<chassis-id/>
<chassis-id-type/>
<id/>
<ttl/>
</state>
</neighbor>
</neighbors>
</interface>
</interfaces>
</lldp>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
   <interfaces>
     <interface>
       <name>eth0</name>
       <config>
         <name>eth0</name>
       </config>
       <neighbors>
         <neighbor>
           <id>08f1.ea53.dbf2</id>
           <state>
             <id>08f1.ea53.dbf2</id>
             <chassis-id>08f1.ea53.dbf0</chassis-id>
             <chassis-id-type>MAC_ADDRESS</chassis-id-type>
             <ttl>120</ttl>
           </state>
         </neighbor>
       </neighbors>
     </interface>
     <interface>
       <name>xe2</name>
       <config>
         <name>xe2</name>
       </config>
       <neighbors>
         <neighbor>
           <id>b86a.97be.193f</id>
           <state>
             <id>b86a.97be.193f</id>
             <chassis-id>b86a.97a7.253c</chassis-id>
             <chassis-id-type>MAC_ADDRESS</chassis-id-type>
             <ttl>121</ttl>
           </state>
         </neighbor>
       </neighbors>
     </interface>
     <interface>
       <name>xe1</name>
       <config>
         <name>xe1</name>
       </config>
       <neighbors>
         <neighbor>
           <id>b86a.97be.193e</id>
           <state>
             <id>b86a.97be.193e</id>
             <chassis-id>10.12.89.136</chassis-id>
             <chassis-id-type>NETWORK_ADDRESS</chassis-id-type>
             <ttl>121</ttl>
           </state>
         </neighbor>
       </neighbors>
     </interface>
```

```
    </interfaces>
  </lldp>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
   <lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
      <interfaces>
        <interface>
          <name>xe1</name>
          <neighbors>
            <agent>
              <agent-type>default</agent-type>
              <neighbor>
                <mac-address>b86a.97be.193e</mac-address>
                <state>
                  <mac-address>b86a.97be.193e</mac-address>
                  <system-capabilties-enabled>Bridge  Router</system-
capabilties-enabled>
                  <system-capabilties>Bridge  Router</system-capabilties>
                  <system-description>Hardware Model:EC_AS5912-54X</system-
description>
                  <max-frame-size>1518</max-frame-size>
                  <link-aggregate-capability>Capable</link-aggregate-
capability>
                  <operational-mau-type>54</operational-mau-type>
                  <auto-negotiation-capability>16</auto-negotiation-
capability>
                  <auto-negotiation-support>1</auto-negotiation-support>
                  <management-vlan>0</management-vlan>
                  <vid-usage-digest>0</vid-usage-digest>
                  <pp-vlanid>0</pp-vlanid>
                  <port-vlan-id>0</port-vlan-id>
                  <ttl>121</ttl>
                  <port-sub-type>3</port-sub-type>
                  <port-description>xe1</port-description>
                  <port-id>b86a.97be.193e</port-id>
                  <chassis-id-type>5</chassis-id-type>
                  <chassis-component>10.12.89.136</chassis-component>
                  <system-name>7031</system-name>
                  <management-list>
                    <address>b86a.97a7.253c</address>
                    <oid>0</oid>
                    <interface-number>10001</interface-number>
                    <interface-number-sub-type>ifindex</interface-number-sub-
type>
                    <address-sub-type>MAC Address</address-sub-type>
                  </management-list>
                </state>
              </neighbor>
            </agent>
          </neighbors>
        </interface>
      </interfaces>
    </lldp>
```

Neighbors port-id, type and description

This is used to display neighbors' port-id, port-id-type and port-description.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter>
<lldp xmlns="http://openconfig.net/yang/lldp">
<interfaces>
<interface>
<neighbors>
<neighbor>
<name>ce50</name>
<state>
<port-id/>
<port-id-type/>
<port-description/>
<management-address/>
<management-address-type/>
</state>
</neighbor>
</neighbors>
</interface>
</interfaces>
</lldp>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
<lldp xmlns="http://openconfig.net/yang/lldp">
 <interfaces>
   <interface>
     <name>eth0</name>
     <config>
       <name>eth0</name>
     </config>
     <neighbors>
       <neighbor>
         <id>08f1.ea53.dbf2</id>
         <state>
           <id>08f1.ea53.dbf2</id>
           <port-id>08f1.ea53.dbf2</port-id>
           <port-id-type>MAC_ADDRESS</port-id-type>
           <port-description>19</port-description>
         </state>
       </neighbor>
     </neighbors>
   </interface>
   <interface>
     <name>xe2</name>
```

```
          <config>
            <name>xe2</name>
          </config>
          <neighbors>
            <neighbor>
              <id>b86a.97be.193f</id>
              <state>
                <id>b86a.97be.193f</id>
                <port-id>b86a.97be.193f</port-id>
                <port-id-type>MAC_ADDRESS</port-id-type>
                <port-description>xe2</port-description>
              </state>
            </neighbor>
          </neighbors>
        </interface>
        <interface>
          <name>xe1</name>
          <config>
            <name>xe1</name>
          </config>
          <neighbors>
            <neighbor>
              <id>b86a.97be.193e</id>
              <state>
                <id>b86a.97be.193e</id>
                <port-id>b86a.97be.193e</port-id>
                <port-id-type>MAC_ADDRESS</port-id-type>
                <port-description>xe1</port-description>
              </state>
            </neighbor>
          </neighbors>
        </interface>
      </interfaces>
    </lldp>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
      <lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
        <interfaces>
          <interface>
            <name>xe1</name>
            <neighbors>
              <agent>
                <agent-type>default</agent-type>
                <neighbor>
                  <mac-address>b86a.97be.193e</mac-address>
                  <state>
                    <mac-address>b86a.97be.193e</mac-address>
                    <system-capabilties-enabled>Bridge  Router</system-
capabilties-enabled>
                    <system-capabilties>Bridge  Router</system-capabilties>
                    <system-description>Hardware Model:EC_AS5912-54X</system-
description>
                    <max-frame-size>1518</max-frame-size>
```

```
                    <link-aggregate-capability>Capable</link-aggregate-
capability>
                    <operational-mau-type>54</operational-mau-type>
                    <auto-negotiation-capability>16</auto-negotiation-
capability>
                    <auto-negotiation-support>1</auto-negotiation-support>
                    <management-vlan>0</management-vlan>
                    <vid-usage-digest>0</vid-usage-digest>
                    <pp-vlanid>0</pp-vlanid>
                    <port-vlan-id>0</port-vlan-id>
                    <ttl>121</ttl>
                    <port-sub-type>3</port-sub-type>
                    <port-description>xe1</port-description>
                    <port-id>b86a.97be.193e</port-id>
                    <chassis-id-type>5</chassis-id-type>
                    <chassis-component>10.12.89.136</chassis-component>
                    <system-name>7031</system-name>
                    <management-list>
                      <address>b86a.97a7.253c</address>
                      <oid>0</oid>
                      <interface-number>10001</interface-number>
                      <interface-number-sub-type>ifindex</interface-number-sub-
type>
                      <address-sub-type>MAC Address</address-sub-type>
                    </management-list>
                  </state>
                </neighbor>
              </agent>
            </neighbors>
          </interface>
        </interfaces>
      </lldp>
```

Neighbors custom TLVs type/subtype

This command is used to display neighbors' custom TLVs type/subtype.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter>
<lldp xmlns="http://openconfig.net/yang/lldp">
<interfaces>
<interface>
<neighbors>
<neighbor>
<custom-tlvs>
<tlv>
<state>
<type>127</type>
<oui>00-80-C2</oui>
<config/>
</state>
</tlv>
```

```
</custom-tlvs>
</neighbor>
</neighbors>
</interface>
</interfaces>
</lldp>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
 <lldp xmlns="http://openconfig.net/yang/lldp">
    <interfaces>
      <interface>
        <name>eth0</name>
        <config>
          <name>eth0</name>
        </config>
        <neighbors>
          <neighbor>
            <id>08f1.ea53.dbf2</id>
            <state><id>08f1.ea53.dbf2</id><system-description>HPE
OfficeConnect Switch 1920S 24G 2SFP JL381A  PD.01.05  Linux 3.6.5-ac96795c  U-
Boot 2012.10-00118-g3773021 (Oct 11 2016 - 15:39:54)</system-
description>0<ttl>120</ttl><port-id-type>MAC_ADDRESS</port-id-type><port-
description>19</port-description><port-id>08f1.ea53.dbf2</port-id><chassis-id-
type>MAC_ADDRESS</chassis-id-type><chassis-id>08f1.ea53.dbf0</chassis-
id><system-name>LAB1-SW13</system-name><management-address>10.12.89.123</
management-address><management-address-type>IP Address</management-address-
type></state>
            <capabilities xmlns:oc-lldp-types="http://openconfig.net/yang/
lldp/types">
              <capability>
                <name>oc-lldp-types:MAC_BRIDGE</name>
                <state>
                  <name>oc-lldp-types:MAC_BRIDGE</name>
                  <enabled>true</enabled>
                </state>
              </capability>
              <capability>
                <name>oc-lldp-types:ROUTER</name>
                <state>
                  <name>oc-lldp-types:ROUTER</name>
                  <enabled>false</enabled>
                </state>
              </capability>
            </capabilities>
            <custom-tlvs>
              <tlv>
                <type>127</type>
                <oui>00-12-0F</oui>
                <oui-subtype>4</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-12-0F</oui>
                  <oui-subtype>4</oui-subtype>
                  <value>0</value>
```

```
                </state>
              </tlv>
              <tlv>
                <type>127</type>
                <oui>00-12-0F</oui>
                <oui-subtype>1</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-12-0F</oui>
                  <oui-subtype>1</oui-subtype>
                  <value>000</value>
                </state>
              </tlv>
              <tlv>
                <type>127</type>
                <oui>00-80-C2</oui>
                <oui-subtype>2</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-80-C2</oui>
                  <oui-subtype>2</oui-subtype>
                  <value>0</value>
                </state>
              </tlv>
              <tlv>
                <type>127</type>
                <oui>00-80-C2</oui>
                <oui-subtype>1</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-80-C2</oui>
                  <oui-subtype>1</oui-subtype>
                  <value>0</value>
                </state>
              </tlv>
            </custom-tlvs>
          </neighbor>
        </neighbors>
      </interface>
      <interface>
        <name>xe2</name>
        <config>
          <name>xe2</name>
        </config>
        <neighbors>
          <neighbor>
            <id>b86a.97be.193f</id>
            <state><id>b86a.97be.193f</id><system-description>Hardware
Model:EC_AS5912-54X</system-description>1<ttl>121</ttl><port-id-
type>MAC_ADDRESS</port-id-type><port-description>xe2</port-description><port-
id>b86a.97be.193f</port-id><chassis-id-type>MAC_ADDRESS</chassis-id-
type><chassis-id>b86a.97a7.253c</chassis-id><system-name>7031</system-
name><management-address>b86a.97a7.253c</management-address><management-
address-type>MAC Address</management-address-type></state>
            <capabilities xmlns:oc-lldp-types="http://openconfig.net/yang/
lldp/types">
              <capability>
                <name>oc-lldp-types:MAC_BRIDGE</name>
```

```
      <state>
        <name>oc-lldp-types:MAC_BRIDGE</name>
        <enabled>true</enabled>
      </state>
    </capability>
    <capability>
      <name>oc-lldp-types:ROUTER</name>
      <state>
        <name>oc-lldp-types:ROUTER</name>
        <enabled>true</enabled>
      </state>
    </capability>
  </capabilities>
  <custom-tlvs>
    <tlv>
      <type>127</type>
      <oui>00-12-0F</oui>
      <oui-subtype>4</oui-subtype>
      <state>
        <type>127</type>
        <oui>00-12-0F</oui>
        <oui-subtype>4</oui-subtype>
        <value>1518</value>
      </state>
    </tlv>
    <tlv>
      <type>127</type>
      <oui>00-12-0F</oui>
      <oui-subtype>1</oui-subtype>
      <state>
        <type>127</type>
        <oui>00-12-0F</oui>
        <oui-subtype>1</oui-subtype>
        <value>11654</value>
      </state>
    </tlv>
    <tlv>
      <type>127</type>
      <oui>00-80-C2</oui>
      <oui-subtype>2</oui-subtype>
      <state>
        <type>127</type>
        <oui>00-80-C2</oui>
        <oui-subtype>2</oui-subtype>
        <value>0</value>
      </state>
    </tlv>
    <tlv>
      <type>127</type>
      <oui>00-80-C2</oui>
      <oui-subtype>1</oui-subtype>
      <state>
        <type>127</type>
        <oui>00-80-C2</oui>
        <oui-subtype>1</oui-subtype>
        <value>0</value>
      </state>
```

```
              </tlv>
            </custom-tlvs>
          </neighbor>
        </neighbors>
      </interface>
      <interface>
        <name>xe1</name>
        <config>
          <name>xe1</name>
        </config>
        <neighbors>
          <neighbor>
            <id>b86a.97be.193e</id>
            <state><id>b86a.97be.193e</id><system-description>Hardware
Model:EC_AS5912-54X</system-description>1<ttl>121</ttl><port-id-
type>MAC_ADDRESS</port-id-type><port-description>xe1</port-description><port-
id>b86a.97be.193e</port-id><chassis-id-type>NETWORK_ADDRESS</chassis-id-
type><chassis-id>10.12.89.136</chassis-id><system-name>7031</system-
name><management-address>b86a.97a7.253c</management-address><management-
address-type>MAC Address</management-address-type></state>
            <capabilities xmlns:oc-lldp-types="http://openconfig.net/yang/
lldp/types">
              <capability>
                <name>oc-lldp-types:MAC_BRIDGE</name>
                <state>
                  <name>oc-lldp-types:MAC_BRIDGE</name>
                  <enabled>true</enabled>
                </state>
              </capability>
              <capability>
                <name>oc-lldp-types:ROUTER</name>
                <state>
                  <name>oc-lldp-types:ROUTER</name>
                  <enabled>true</enabled>
                </state>
              </capability>
            </capabilities>
            <custom-tlvs>
              <tlv>
                <type>127</type>
                <oui>00-12-0F</oui>
                <oui-subtype>4</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-12-0F</oui>
                  <oui-subtype>4</oui-subtype>
                  <value>1518</value>
                </state>
              </tlv>
              <tlv>
                <type>127</type>
                <oui>00-12-0F</oui>
                <oui-subtype>1</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-12-0F</oui>
                  <oui-subtype>1</oui-subtype>
                  <value>11654</value>
```

```
            </state>
          </tlv>
          <tlv>
            <type>127</type>
            <oui>00-80-C2</oui>
            <oui-subtype>2</oui-subtype>
            <state>
              <type>127</type>
              <oui>00-80-C2</oui>
              <oui-subtype>2</oui-subtype>
              <value>0</value>
            </state>
          </tlv>
          <tlv>
            <type>127</type>
            <oui>00-80-C2</oui>
            <oui-subtype>1</oui-subtype>
            <state>
              <type>127</type>
              <oui>00-80-C2</oui>
              <oui-subtype>1</oui-subtype>
              <value>0</value>
            </state>
          </tlv>
        </custom-tlvs>
      </neighbor>
    </neighbors>
  </interface>
 </interfaces>
</lldp>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
<lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
 <interfaces>
   <interface>
     <name>xe1</name>
     <neighbors>
       <agent>
         <agent-type>default</agent-type>
         <neighbor>
           <mac-address>b86a.97be.193e</mac-address>
           <state>
             <mac-address>b86a.97be.193e</mac-address>
             <pp-vlanid>0</pp-vlanid>
           </state>
         </neighbor>
       </agent>
     </neighbors>
   </interface>
 </interfaces>
</lldp>
```

Neighbors custom TLVs

This command is used to display neighbors' custom TLVs.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter>
<lldp xmlns="http://openconfig.net/yang/lldp">
<interfaces>
<interface>
<name>ce50</name>
<neighbors>
<neighbor>
<custom-tlvs>
<tlv>
<type>127</type>
<oui>0-80-C2</oui>
</tlv>
</custom-tlvs>
</neighbor>
</neighbors>
</interface>
</interfaces>
</lldp>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
  <lldp xmlns="http://openconfig.net/yang/lldp">
    <interfaces>
      <interface>
        <name>xe1</name>
        <config>
          <name>xe1</name>
        </config>
        <neighbors>
          <neighbor>
            <id>b86a.97be.193e</id>
            <state><id>b86a.97be.193e</id><system-description>Hardware
Model:EC_AS5912-54X</system-description>1<ttl>121</ttl><port-id-
type>MAC_ADDRESS</port-id-type><port-description>xe1</port-description><port-
id>b86a.97be.193e</port-id><chassis-id-type>NETWORK_ADDRESS</chassis-id-
type><chassis-id>10.12.89.136</chassis-id><system-name>7031</system-
name><management-address>b86a.97a7.253c</management-address><management-
address-type>MAC Address</management-address-type></state>
            <capabilities xmlns:oc-lldp-types="http://openconfig.net/yang/
lldp/types">
              <capability>
                <name>oc-lldp-types:MAC_BRIDGE</name>
                <state>
                  <name>oc-lldp-types:MAC_BRIDGE</name>
                  <enabled>true</enabled>
```

```
        </state>
      </capability>
      <capability>
        <name>oc-lldp-types:ROUTER</name>
        <state>
          <name>oc-lldp-types:ROUTER</name>
          <enabled>true</enabled>
        </state>
      </capability>
    </capabilities>
    <custom-tlvs>
      <tlv>
        <type>127</type>
        <oui>00-12-0F</oui>
        <oui-subtype>4</oui-subtype>
        <state>
          <type>127</type>
          <oui>00-12-0F</oui>
          <oui-subtype>4</oui-subtype>
          <value>1518</value>
        </state>
      </tlv>
      <tlv>
        <type>127</type>
        <oui>00-12-0F</oui>
        <oui-subtype>1</oui-subtype>
        <state>
          <type>127</type>
          <oui>00-12-0F</oui>
          <oui-subtype>1</oui-subtype>
          <value>11654</value>
        </state>
      </tlv>
      <tlv>
        <type>127</type>
        <oui>00-80-C2</oui>
        <oui-subtype>2</oui-subtype>
        <state>
          <type>127</type>
          <oui>00-80-C2</oui>
          <oui-subtype>2</oui-subtype>
          <value>0</value>
        </state>
      </tlv>
      <tlv>
        <type>127</type>
        <oui>00-80-C2</oui>
        <oui-subtype>1</oui-subtype>
        <state>
          <type>127</type>
          <oui>00-80-C2</oui>
          <oui-subtype>1</oui-subtype>
          <value>0</value>
        </state>
      </tlv>
    </custom-tlvs>
  </neighbor>
```

```
        </neighbors>
      </interface>
    </interfaces>
  </lldp>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
<lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
  <interfaces>
    <interface>
      <name>xe1</name>
      <neighbors>
        <agent>
          <agent-type>default</agent-type>
          <neighbor>
            <mac-address>b86a.97be.193e</mac-address>
            <state>
              <mac-address>b86a.97be.193e</mac-address>
              <port-vlan-id>0</port-vlan-id>
            </state>
          </neighbor>
        </agent>
      </neighbors>
    </interface>
  </interfaces>
</lldp>
```

Neighbors capabilities

This command is used to display neighbors' capabilities.

OpenConfig Filter

Here is the OpenConfig filter for the get operation that results in the Get OpenConfig Return output shown below.

```
<filter>
<lldp xmlns="http://openconfig.net/yang/lldp">
<interfaces>
<interface>
<name>ce50</name>
<neighbors>
<neighbor>
<capabilities>
<capability>
<name/>
<config/>
<state/>
</capability>
</capabilities>
</neighbor>
</neighbors>
</interface>
```

```
</interfaces>
</lldp>
</filter>
```

OpenConfig get result

Here is a NetConf validation response that provides detailed information on the configuration and runtime.

```
  <lldp xmlns="http://openconfig.net/yang/lldp">
    <interfaces>
      <interface>
        <name>xe1</name>
        <config>
          <name>xe1</name>
        </config>
        <neighbors>
          <neighbor>
            <id>b86a.97be.193e</id>
            <state><id>b86a.97be.193e</id><system-description>Hardware
Model:EC_AS5912-54X</system-description>1<ttl>121</ttl><port-id-
type>MAC_ADDRESS</port-id-type><port-description>xe1</port-description><port-
id>b86a.97be.193e</port-id><chassis-id-type>NETWORK_ADDRESS</chassis-id-
type><chassis-id>10.12.89.136</chassis-id><system-name>7031</system-
name><management-address>b86a.97be.193e</management-address><management-
address-type>MAC Address</management-address-type></state>
            <capabilities xmlns:oc-lldp-types="http://openconfig.net/yang/
lldp/types">
              <capability>
                <name>oc-lldp-types:MAC_BRIDGE</name>
                <state>
                  <name>oc-lldp-types:MAC_BRIDGE</name>
                  <enabled>true</enabled>
                </state>
              </capability>
              <capability>
                <name>oc-lldp-types:ROUTER</name>
                <state>
                  <name>oc-lldp-types:ROUTER</name>
                  <enabled>true</enabled>
                </state>
              </capability>
            </capabilities>
            <custom-tlvs>
              <tlv>
                <type>127</type>
                <oui>00-12-0F</oui>
                <oui-subtype>4</oui-subtype>
                <state>
                  <type>127</type>
                  <oui>00-12-0F</oui>
                  <oui-subtype>4</oui-subtype>
                  <value>1522</value>
                </state>
              </tlv>
              <tlv>
                <type>127</type>
                <oui>00-12-0F</oui>
                <oui-subtype>1</oui-subtype>
```

```
            <state>
              <type>127</type>
              <oui>00-12-0F</oui>
              <oui-subtype>1</oui-subtype>
              <value>11654</value>
            </state>
          </tlv>
          <tlv>
            <type>127</type>
            <oui>00-80-C2</oui>
            <oui-subtype>4</oui-subtype>
            <state>
              <type>127</type>
              <oui>00-80-C2</oui>
              <oui-subtype>4</oui-subtype>
              <value>Rapid-Spanning-Tree-Protocol</value>
            </state>
          </tlv>
          <tlv>
            <type>127</type>
            <oui>00-80-C2</oui>
            <oui-subtype>2</oui-subtype>
            <state>
              <type>127</type>
              <oui>00-80-C2</oui>
              <oui-subtype>2</oui-subtype>
              <value>0</value>
            </state>
          </tlv>
          <tlv>
            <type>127</type>
            <oui>00-80-C2</oui>
            <oui-subtype>1</oui-subtype>
            <state>
              <type>127</type>
              <oui>00-80-C2</oui>
              <oui-subtype>1</oui-subtype>
              <value>1</value>
            </state>
          </tlv>
          <tlv>
            <type>127</type>
            <oui>00-80-C2</oui>
            <oui-subtype>3</oui-subtype>
            <state>
              <type>127</type>
              <oui>00-80-C2</oui>
              <oui-subtype>3</oui-subtype>
              <value>1default</value>
            </state>
          </tlv>
        </custom-tlvs>
      </neighbor>
    </neighbors>
  </interface>
</interfaces>
</lldp>
```

OcNOS get result

Here is the NetConf response in IPI datamodel representation.

```
<lldp xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-lldpv2">
  <interfaces>
    <interface>
      <name>xe1</name>
      <neighbors>
        <agent>
          <agent-type>default</agent-type>
          <neighbor>
            <mac-address>b86a.97be.193e</mac-address>
            <state>
              <mac-address>b86a.97be.193e</mac-address>
              <port-vlan-id>0</port-vlan-id>
            </state>
          </neighbor>
        </agent>
      </neighbors>
    </interface>
  </interfaces>
</lldp>
```

ACL OpenConfig Translation

Enable Management Attributes

This XML configuration snippet is used to create an Access Control List (ACL) entry to operate over L2 data traffic.

Release

This configuration was introduced in OcNOS version 6.5.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to enable management attributes.

```
<acl xmlns="http://openconfig.net/yang/acl">
  <acl-sets>
    <acl-set>
      <name>ACL_OC_L2</name>
      <type
        xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_L2</type>
      <config>
        <name>ACL_OC_L2</name>
        <type
          xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_L2</type>
        <description>ACL L2 CFG Test</description>
      </config>
      <acl-entries>
        <acl-entry>
          <sequence-id>1</sequence-id>
          <config>
            <sequence-id>1</sequence-id>
          </config>
          <l2>
            <config>
              <destination-mac>00BB.CCDD.EEFF</destination-mac>
              <destination-mac-mask>AC00.0000.0000</destination-mac-mask>
              <ethertype>ETHERTYPE_IPV4</ethertype>
              <source-mac>0000.CCDD.EEFF</source-mac>
              <source-mac-mask>AABB.0000.0000</source-mac-mask>
            </config>
          </l2>
          <actions>
            <config>
              <forwarding-action
                xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACCEPT</
forwarding-action>
              <log-action>LOG_SYSLOG</log-action>
            </config>
          </actions>
        </acl-entry>
```

```
      </acl-entries>
    </acl-set>
  </acl-sets>
</acl>
```

OcNOS CLI Command

This CLI command is used to enable management attributes.

```
mac access-list ACL_OC_L2
 remark ACL L2 CFG Test
 1 permit 0000.CCDD.EEFF AABB.0000.0000 00BB.CCDD.EEFF AC00.0000.0000 ipv4 log
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to enable management attributes.

```
  <acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
    <acl-sets>
      <acl-set>
        <name>ACL_OC_L2</name>
        <type>mac</type>
        <config>
          <name>ACL_OC_L2</name>
          <type>mac</type>
          <description>ACL L2 CFG Test</description>
        </config>
        <acl-entries>
          <acl-entry>
            <sequence-id>1</sequence-id>
            <config>
              <sequence-id>1</sequence-id>
            </config>
            <mac>
              <config>
                <destination-mac-address>0000.0000.0000</destination-mac-
address>
                <destination-mac-mask>AA32.CCDD.EE10</destination-mac-mask>
                <ethertype>ipv4</ethertype>
                <source-mac-address>0000.0000.00EE</source-mac-address>
                <source-mac-mask>AABB.CCDD.EE11</source-mac-mask>
                <forwarding-action>permit</forwarding-action>
                <monitor-action>log</monitor-action>
              </config>
            </mac>
          </acl-entry>
        </acl-entries>
      </acl-set>
    </acl-sets>
  </acl>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about enabling management attributes.

```
    <acl xmlns="http://openconfig.net/yang/acl">
      <acl-sets>
        <acl-set>
          <name>ACL_OC_L2</name>
          <type
            xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_L2</type>
          <config>
            <name>ACL_OC_L2</name>
            <type
              xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_L2</
type>
            <description>ACL L2 CFG Test</description>
          </config>
          <acl-entries>
            <acl-entry>
              <sequence-id>1</sequence-id>
              <config>
                <sequence-id>1</sequence-id>
              </config>
              <mac>
                <config>
                  <source-mac>0000.CCDD.EEFF</source-mac>
                  <source-mac-mask>AABB.0000.0000</source-mac-mask>
                  <ethertype>ETHERTYPE_IPV4</ethertype>
                  <destination-mac>00BB.CCDD.EEFF</destination-mac>
                  <destination-mac-mask>AC00.0000.0000</destination-mac-mask>
                </config>
              </mac>
              <actions>
                <config>
                  <forwarding-action
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACCEPT</forwarding-action>
                  <log-action
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:LOG_SYSLOG</log-action>
                </config>
              </actions>
            </acl-entry>
          </acl-entries>
        </acl-set>
      </acl-sets>
    </acl>
```

Restrictions

The leaf `/oc-acl:acl/acl-sets/acl-set/acl-entries/acl-entry/actions/config/log-action` is only valid on DC platform. Other leaves are valid on all the platforms.

Create IPv4 Entries

This XML configuration snippet is used to create an ACL entry to operate over IPv4 data traffic.

Release

This configuration was introduced in OcNOS version 6.5.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create IPv4 entries.

```
        <acl xmlns="http://openconfig.net/yang/acl">
          <acl-sets>
            <acl-set>
              <name>ACL_OC_IPV4</name>
              <type
                xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_IPV4</
type>
              <config>
                <name>ACL_OC_IPV4</name>
                <type
                  xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_IPV4</
type>
                <description>ACL TFW Test</description>
              </config>
              <acl-entries>
                <acl-entry>
                  <sequence-id>10</sequence-id>
                  <config>
                    <sequence-id>10</sequence-id>
                  </config>
                  <ipv4>
                    <config>
                      <source-address>1.1.1.0/24</source-address>
                      <destination-address>2.2.2.0/24</destination-address>
                      <dscp>18</dscp>
                      <protocol>6</protocol>
                    </config>
                  </ipv4>
                  <actions>
                    <config>
                      <forwarding-action
                        xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACCEPT</forwarding-action>
                      <log-action>LOG_SYSLOG</log-action>
                    </config>
                  </actions>
                  <transport>
                    <config>
                      <explicit-tcp-flags
                        xmlns:oc-pkt-match-types="http://openconfig.net/yang/
packet-match-types">oc-pkt-match-types:TCP_SYN</explicit-tcp-flags>
                      <source-port>22</source-port>
                      <destination-port>80</destination-port>
                    </config>
                  </transport>
                </acl-entry>
              </acl-entries>
            </acl-set>
```

```
    </acl-sets>
  </acl>
```

OcNOS CLI Command

This CLI command is used to create IPv4 entries.

```
ip access-list ACL_OC_IPV4
 remark ACL TFW Test
 10 permit tcp 1.1.1.0/24 2.2.2.0/24 dscp af21 syn log
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create IPv4 entries.

```
<acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
  <acl-sets>
    <acl-set>
      <name>ACL_OC_IPV4</name>
      <type>ip</type>
      <config>
        <name>ACL_OC_IPV4</name>
        <type>ip</type>
        <description>ACL TFW Test</description>
      </config>
      <acl-entries>
        <acl-entry>
          <sequence-id>10</sequence-id>
          <config>
            <sequence-id>10</sequence-id>
          </config>
          <ipv4>
            <config>
              <source-address>1.1.1.0/24</source-address>
              <destination-address>2.2.2.0/24</destination-address>
              <dscp>18</dscp>
              <protocol-tcp />
              <tcp-source-port>22</tcp-source-port>
              <tcp-destination-port>80</tcp-destination-port>
              <tcp-flags>syn</tcp-flags>
              <forwarding-action>permit</forwarding-action>
              <monitor-action>log</monitor-action>
            </config>
          </ipv4>
        </acl-entry>
      </acl-entries>
    </acl-set>
  </acl-sets>
</acl>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating IPv4 entries.

```
    <acl xmlns="http://openconfig.net/yang/acl">
      <acl-sets>
        <acl-set>
          <name>ACL_OC_IPV4</name>
          <type
            xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_IPV4</
type>
          <config>
            <name>ACL_OC_IPV4</name>
            <type
              xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_IPV4</
type>
            <description>ACL TFW Test</description>
          </config>
          <acl-entries>
            <acl-entry>
              <sequence-id>10</sequence-id>
              <config>
                <sequence-id>10</sequence-id>
              </config>
              <ipv4>
                <config>
                  <source-address>1.1.1.0/24</source-address>
                  <destination-address>2.2.2.0/24</destination-address>
                  <dscp>18</dscp>
                  <protocol>6</protocol>
                </config>
              </ipv4>
              <actions>
                <config>
                  <forwarding-action
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACCEPT</forwarding-action>
                  <log-action
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:LOG_SYSLOG</log-action>
                </config>
              </actions>
              <transport>
                <config>
                  <explicit-tcp-flags
                    xmlns:oc-pkt-match-types="http://openconfig.net/yang/
packet-match-types">oc-pkt-match-types:TCP_SYN</explicit-tcp-flags>
                </config>
              </transport>
            </acl-entry>
          </acl-entries>
        </acl-set>
      </acl-sets>
    </acl>
```

Restrictions

- The leaf `/oc-acl:acl/acl-sets/acl-set/acl-entries/acl-entry/actions/config/log-action` is only valid on DC platform.
- The Open Config leaf `/oc-acl:acl/acl-sets/acl-set/acl-entries/acl-entry[sequence-id]/transport/config/tcp-flags` was named in version 2.0.0. It is now renamed as **explicit-tcp-flags**. The new

XPath is `/oc-acl:acl/acl-sets/acl-set/acl-entries/acl-entry/transport/config/explicit-tcp-flags`.

- OpenConfig leaves `/acl/acl-sets/acl-set/acl-entries/acl-entry/transport/config/explicit-tcp-flags` and `/acl/acl-sets/acl-set/acl-entries/acl-entry/transport/state/explicit-tcp-flags` have the following mapping:

OpenConfig XPath `/oc-acl:acl/acl-sets/acl-set/acl-entries/acl-entry/transport/config/explicit-tcp-flags`	**OcNOS XPath** `/acl/acl-sets/acl-set/acl-entries/acl-entry/ipv4/config/tcp-flags`
TCP_ACK	ack
TCP_FIN	fin
TCP_PSH	psh
TCP_RST	rst
TCP_SYN	syn
TCP_URG	urg
TCP_IPI_ESTABLISHED Note: This value has been add by OcNOS through deviation file `ipi-oc-acl-deviations.yang`)	established

Create IPv6 Entries

This XML configuration snippet is used to create an Access Control List (ACL) entry to operate over IPv6 data traffic.

Release

This configuration was introduced in OcNOS version 6.5.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create IPv6 entries.

```
        <acl xmlns="http://openconfig.net/yang/acl">
          <acl-sets>
            <acl-set>
              <name>ACL_OC_IPV6</name>
              <type
                xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_IPV6</
    type>
              <config>
                <name>ACL_OC_IPV6</name>
                <type
                  xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_IPV6</
    type>
                <description>ACL TFW Test</description>
              </config>
              <acl-entries>
                <acl-entry>
                  <sequence-id>11</sequence-id>
                  <config>
```

```
                <sequence-id>11</sequence-id>
              </config>
              <ipv6>
                <config>
                  <source-address>2000::/8</source-address>
                  <destination-address>2001::/16</destination-address>
                  <dscp>23</dscp>
                  <protocol>6</protocol>
                </config>
              </ipv6>
              <actions>
                <config>
                  <forwarding-action
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:REJECT</forwarding-action>
                <log-action>LOG_SYSLOG</log-action>
                </config>
              </actions>
            </acl-entry>
          </acl-entries>
        </acl-set>
      </acl-sets>
    </acl>
```

OcNOS CLI Command

This CLI command is used to create IPv6 entries.

```
ipv6 access-list ACL_OC_IPV6
 remark ACL TFW Test
 11 deny tcp 2000::/8 2001::/16 dscp 23
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create IPv6 entries.

```
        <acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
          <acl-sets>
            <acl-set>
              <name>ACL_OC_IPV6</name>
              <type>ipv6</type>
              <config>
                <name>ACL_OC_IPV6</name>
                <type>ipv6</type>
                <description>ACL TFW Test</description>
              </config>
              <acl-entries>
                <acl-entry>
                  <sequence-id>11</sequence-id>
                  <config>
                    <sequence-id>11</sequence-id>
                  </config>
                  <ipv6>
                    <config>
                      <source-address>2000::/8</source-address>
```

```
                    <destination-address>2001::/16</destination-address>
                    <dscp>23</dscp>
                    <protocol-tcp />
                    <forwarding-action>deny</forwarding-action>
                    <monitor-action>log</monitor-action>
                  </config>
                </ipv6>
              </acl-entry>
            </acl-entries>
          </acl-set>
        </acl-sets>
      </acl>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating IPv6 entries.

```
          <acl xmlns="http://openconfig.net/yang/acl">
      <acl-sets>
        <acl-set>
          <name>ACL_OC_IPV6</name>
          <type
            xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_IPV6</
type>
          <config>
            <name>ACL_OC_IPV6</name>
            <type
              xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_IPV6</
type>
            <description>ACL TFW Test</description>
          </config>
          <acl-entries>
            <acl-entry>
              <sequence-id>11</sequence-id>
              <config>
                <sequence-id>11</sequence-id>
              </config>
              <ipv6>
                <config>
                  <source-address>2000::/8</source-address>
                  <destination-address>2001::/16</destination-address>
                  <dscp>23</dscp>
                  <protocol>6</protocol>
                </config>
              </ipv6>
              <actions>
                <config>
                  <forwarding-action
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:REJECT</forwarding-action>
                  <log-action
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:LOG_SYSLOG</log-action>
                </config>
              </actions>
            </acl-entry>
          </acl-entries>
```

```
      </acl-set>
    </acl-sets>
  </acl>
```

Restrictions

- The leaf `/oc-acl:acl/acl-sets/acl-set/acl-entries/acl-entry/actions/config/log-action` is only valid on DC platform.
- The old Open Config leaf `/oc-acl:acl/acl-sets/acl-set/acl-entries/acl-entry/transport/config/tcp-flags` was renamed on Open Config **v2.0.0**, now it is named **explicit-tcp-flags**. The new xpath is `/oc-acl:acl/acl-sets/acl-set/acl-entries/acl-entry/transport/config/explicit-tcp-flags`.
- OpenConfig leaves `/acl/acl-sets/acl-set/acl-entries/acl-entry/transport/config/explicit-tcp-flags` and `/acl/acl-sets/acl-set/acl-entries/acl-entry/transport/state/explicit-tcp-flags` have the following mapping:

OpenConfig XPath `/oc-acl:acl/acl-sets/acl-set/acl-entries/acl-entry/transport/config/explicit-tcp-flags`	**OcNOS XPath** `/acl/acl-sets/acl-set/acl-entries/acl-entry/ipv6/config/tcp-flags`
`TCP_ACK`	`ack`
`TCP_FIN`	`fin`
`TCP_PSH`	`psh`
`TCP_RST`	`rst`
`TCP_SYN`	`syn`
`TCP_URG`	`urg`
`TCP_IPI_ESTABLISHED` Note: This value has been added by OcNOS through deviation file `ipi-oc-acl-deviations.yang`	`established`

Create Interfaces Egress for IPv4/IPv6

This XML configuration snippet is used to associate an Access Control List (ACL) entry type IPv4/IPv6 to an interface on egress direction.

The interface can associate only one ACL entry at a time.

Release

This configuration was introduced in OcNOS version 6.5.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create interfaces egress for IPv4/IPv6.

```
    <acl xmlns="http://openconfig.net/yang/acl">
  <interfaces>
    <interface>
```

```
            <id>eth1</id>
            <config>
              <id>eth1</id>
            </config>
            <egress-acl-sets>
              <egress-acl-set>
                <type
                  xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACL_IPV4</type>
                <set-name>ACL_OC_IPV4</set-name>
                <config>
                  <set-name>ACL_OC_IPV4</set-name>
                  <type
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACL_IPV4</type>
                </config>
              </egress-acl-set>
            </egress-acl-sets>
            <interface-ref>
              <config>
                <interface>eth1</interface>
              </config>
            </interface-ref>
          </interface>
        </interfaces>
      </acl>
```

OcNOS CLI Command

This CLI command is used to create interfaces egress for IPv4/IPv6.

```
ip access-list ACL_OC_IPV4
 remark ACL TFW Test
 10 permit tcp 1.1.1.0/24 2.2.2.0/24 dscp af21 syn
!
interface eth1
 ip access-group ACL_OC_IPV4 out
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create interfaces egress for IPv4/IPv6.

```
                <acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
            <interfaces>
              <interface>
                <name>eth1</name>
                <config>
                  <name>eth1</name>
                </config>
                <egress-acl-sets>
                  <egress-acl-set>
                    <acl-type>ip</acl-type>
                    <access-groups>
                      <access-group>
                        <acl-name>ACL_OC_IPV4</acl-name>
                        <config>
                          <acl-name>ACL_OC_IPV4</acl-name>
```

```
                    </config>
                  </access-group>
                </access-groups>
                <config>
                  <acl-type>ip</acl-type>
                </config>
              </egress-acl-set>
            </egress-acl-sets>
          </interface>
        </interfaces>
      </acl>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating interfaces egress for IPv4/IPv6.

```
        <acl xmlns="http://openconfig.net/yang/acl">
      <interfaces>
        <interface>
          <id>eth1</id>
          <config>
            <id>eth1</id>
          </config>
          <egress-acl-sets>
            <egress-acl-set>
              <type
                xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACL_IPV4</type>
              <set-name>ACL_OC_IPV4</set-name>
              <config>
                <set-name>ACL_OC_IPV4</set-name>
                <type
                  xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACL_IPV4</type>
              </config>
            </egress-acl-set>
          </egress-acl-sets>
          <interface-ref>
            <config>
              <interface>eth1</interface>
            </config>
          </interface-ref>
        </interface>
      </interfaces>
    </acl>
```

Restrictions

- Only one ACL entry can be associated on the interface in egress direction.
- The leaf `/acl/interfaces/interface/id` must have the format “<interface>.<subinterface>”. For example, xe10.2, and must be limited to 32 characters.

Create Interfaces Ingress for IPv4/IPv6

This XML configuration snippet is used to associate an Access Control List entry type IPv4/IPv6 to an interface on ingress direction.

The interface can associate only one ACL entry at a time.

Release

This configuration was introduced in OcNOS version 6.5.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create interfaces ingress for IPv4/IPv6.

```
          <acl xmlns="http://openconfig.net/yang/acl">
        <interfaces>
          <interface>
            <id>eth1</id>
            <config>
              <id>eth1</id>
            </config>
            <ingress-acl-sets>
              <ingress-acl-set>
                <type
                  xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACL_IPV4</type>
                <set-name>ACL_OC_IPV4</set-name>
                <config>
                  <set-name>ACL_OC_IPV4</set-name>
                  <type
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACL_IPV4</type>
                </config>
              </ingress-acl-set>
            </ingress-acl-sets>
            <interface-ref>
              <config>
                <interface>eth1</interface>
              </config>
            </interface-ref>
          </interface>
        </interfaces>
      </acl>
```

OcNOS CLI Command

This CLI command is used to create interfaces ingress for IPv4/IPv6.

```
ip access-list ACL_OC_IPV4
 remark ACL TFW Test
 10 permit tcp 1.1.1.0/24 2.2.2.0/24 dscp af21 syn
!
interface eth1
```

```
 ip access-group ACL_OC_IPV4 in
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create interfaces ingress for IPv4/IPv6.

```
              <acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
            <interfaces>
              <interface>
                <name>eth1</name>
                <config>
                  <name>eth1</name>
                </config>
                <ingress-acl-sets>
                  <ingress-acl-set>
                    <acl-type>ip</acl-type>
                    <access-groups>
                      <access-group>
                        <acl-name>ACL_OC_IPV4</acl-name>
                        <config>
                          <acl-name>ACL_OC_IPV4</acl-name>
                        </config>
                      </access-group>
                    </access-groups>
                    <config>
                      <acl-type>ip</acl-type>
                    </config>
                  </ingress-acl-set>
                </ingress-acl-sets>
              </interface>
            </interfaces>
          </acl>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating interfaces ingress for IPv4/IPv6.

```
            <acl xmlns="http://openconfig.net/yang/acl">
          <interfaces>
            <interface>
              <id>eth1</id>
              <config>
                <id>eth1</id>
              </config>
              <ingress-acl-sets>
                <ingress-acl-set>
                  <type
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
    acl:ACL_IPV4</type>
                  <set-name>ACL_OC_IPV4</set-name>
                  <config>
                    <set-name>ACL_OC_IPV4</set-name>
                    <type
                      xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
    acl:ACL_IPV4</type>
                  </config>
```

```
            </ingress-acl-set>
          </ingress-acl-sets>
          <interface-ref>
            <config>
              <interface>eth1</interface>
            </config>
          </interface-ref>
        </interface>
      </interfaces>
    </acl>
```

Restrictions

- Only one ACL entry can be associated on the interface in ingress direction.
- The leaf `/acl/interfaces/interface/id` must have the format “<interface>.<subinterface>”. For example, xe10.2, and must be limited to 32 characters.

Create Interfaces Egress for L2

This XML configuration snippet is used to associate an Access Control List (ACL) entry type L2 to an interface on egress direction.

The interface can associate only one ACL entry at a time.

Release

This configuration was introduced in OcNOS version 6.5.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create interfaces egress for L2.

```
            <acl xmlns="http://openconfig.net/yang/acl">
      <interfaces>
        <interface>
          <id>eth3</id>
          <config>
            <id>eth3</id>
          </config>
          <egress-acl-sets>
            <egress-acl-set>
              <type
                xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_L2</
type>
              <set-name>ACL_OC_L2</set-name>
              <config>
                <set-name>ACL_OC_L2</set-name>
                <type
                  xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACL_L2</type>
              </config>
            </egress-acl-set>
          </egress-acl-sets>
```

```
            <interface-ref>
              <config>
                <interface>eth3</interface>
              </config>
            </interface-ref>
          </interface>
        </interfaces>
      </acl>
```

OcNOS CLI Command

This CLI command is used to create interfaces egress for L2.

```
mac access-list ACL_OC_L2
 remark ACL L2 CFG Test
 1 permit 0000.CCDD.EEFF AABB.0000.0000 00BB.CCDD.EEFF AC00.0000.0000 ipv4
!
interface eth3
 mac access-group ACL_OC_L2 out
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create interfaces egress for L2.

```
            <acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
          <interfaces>
            <interface>
              <name>eth3</name>
              <config>
                <name>eth3</name>
              </config>
              <egress-acl-sets>
                <egress-acl-set>
                  <acl-type>mac</acl-type>
                  <access-groups>
                    <access-group>
                      <acl-name>ACL_OC_L2</acl-name>
                      <config>
                        <acl-name>ACL_OC_L2</acl-name>
                      </config>
                    </access-group>
                  </access-groups>
                  <config>
                    <acl-type>mac</acl-type>
                  </config>
                </egress-acl-set>
              </egress-acl-sets>
            </interface>
          </interfaces>
        </acl>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating interfaces egress for L2.

```
          <acl xmlns="http://openconfig.net/yang/acl">
        <interfaces>
          <interface>
            <id>eth3</id>
            <config>
              <id>eth3</id>
            </config>
            <egress-acl-sets>
              <egress-acl-set>
                <type
                  xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_L2</
type>
                <set-name>ACL_OC_L2</set-name>
                <config>
                  <set-name>ACL_OC_L2</set-name>
                  <type
                    xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACL_L2</type>
                </config>
              </egress-acl-set>
            </egress-acl-sets>
            <interface-ref>
              <config>
                <interface>eth3</interface>
              </config>
            </interface-ref>
          </interface>
        </interfaces>
      </acl>
```

Restrictions

- Only one ACL entry can be associated on the interface in egress direction.
- The leaf `/acl/interfaces/interface/id` must have the format “<interface>.<subinterface>”. For example, xe10.2, and must be limited to 32 characters.

Create Interfaces Ingress for L2

This XML configuration snippet is used to associate an Access Control List (ACL) entry type L2 to an interface on ingress direction.

The interface can associate only one ACL entry at a time.

Release

This configuration was introduced in OcNOS version 6.5.0.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create interfaces ingress for L2.

```
          <acl xmlns="http://openconfig.net/yang/acl">
        <interfaces>
```

```
        <interface>
          <id>eth3</id>
          <config>
            <id>eth3</id>
          </config>
          <ingress-acl-sets>
            <ingress-acl-set>
              <type
                xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_L2</
type>
              <set-name>ACL_OC_L2</set-name>
              <config>
                <set-name>ACL_OC_L2</set-name>
                <type
                  xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACL_L2</type>
              </config>
            </ingress-acl-set>
          </ingress-acl-sets>
          <interface-ref>
            <config>
              <interface>eth3</interface>
            </config>
          </interface-ref>
        </interface>
      </interfaces>
    </acl>
```

OcNOS CLI Command

This CLI command is used to create interfaces ingress for L2.

```
mac access-list ACL_OC_L2
 remark ACL L2 CFG Test
 1 permit 0000.CCDD.EEFF AABB.0000.0000 00BB.CCDD.EEFF AC00.0000.0000 ipv4
!
interface eth3
 mac access-group ACL_OC_L2 in
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create interfaces ingress for L2.

```
            <acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
        <interfaces>
          <interface>
            <name>eth3</name>
            <config>
              <name>eth3</name>
            </config>
            <ingress-acl-sets>
              <ingress-acl-set>
                <acl-type>mac</acl-type>
                <access-groups>
                  <access-group>
                    <acl-name>ACL_OC_L2</acl-name>
```

```
                    <config>
                      <acl-name>ACL_OC_L2</acl-name>
                    </config>
                  </access-group>
                </access-groups>
                <config>
                  <acl-type>mac</acl-type>
                </config>
              </ingress-acl-set>
            </ingress-acl-sets>
          </interface>
        </interfaces>
      </acl>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating interfaces ingress for L2.

```
        <acl xmlns="http://openconfig.net/yang/acl">
      <interfaces>
        <interface>
          <id>eth3</id>
          <config>
            <id>eth3</id>
          </config>
          <ingress-acl-sets>
            <ingress-acl-set>
              <type
                xmlns:oc-acl="http://openconfig.net/yang/acl">oc-acl:ACL_L2</
type>
              <set-name>ACL_OC_L2</set-name>
              <config>
                <set-name>ACL_OC_L2</set-name>
                <type
                  xmlns:oc-acl="http://openconfig.net/yang/acl">oc-
acl:ACL_L2</type>
              </config>
            </ingress-acl-set>
          </ingress-acl-sets>
          <interface-ref>
            <config>
              <interface>eth3</interface>
            </config>
          </interface-ref>
        </interface>
      </interfaces>
    </acl>
```

Restrictions

- Only one ACL entry can be associated on the interface in ingress direction.
- The leaf `/acl/interfaces/interface/id` must have the format “<interface>.<subinterface>”. For example, xe10.2, and must be limited to 32 characters.

QoS OpenConfig Translation

Enable QoS on OcNOS

The below configuration is used to enable QoS on OcNOS.

Release

This configuration was introduced in OcNOS version 6.5.0.

Configuration

The QoS protocol is enabled by default in OcNOS version 6.5.0. However, the QoS protocol needs to be enabled in the older versions before configuring QoS features.

Note that there is no equivalent configuration to enable/disable QoS protocol in OpenConfig model.

OpenConfig NetConf Payload

There is no equivalent configuration in OpenConfig model.

OcNOS CLI command

The below CLI command is used to enable QoS on OcNOS.

```
OcNOS#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
OcNOS(config)#qos enable
OcNOS(config)#commit
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to enable QoS on OcNOS.

```
<qos xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-qos">
 <global>
   <config>
     <enable-qos>enable</enable-qos>
   </config>
 </global>
</qos>
```

Validation with NetConf get

There is no equivalent configuration.

Restrictions

- In OcNOS version 6.5.0, the QoS protocol is already enabled by default.
- In OcNOS versions earlier than 6.5.0, the QoS protocol needs to be enabled before configuring QoS features.

Enable QoS Profile on OcNOS

Release

This configuration was introduced in OcNOS version 6.5.0.

Configuration

The QoS feature on OcNOS model needs the Hw profile to be enabled on DC Hardware types.
Note that there is no equivalent configuration on OpenConfig model.

OpenConfig NetConf Payload

There is no equivalent configuration.

OcNOS CLI command

The below CLI command is used to enable QoS Profile on OcNOS.

```
hardware-profile filter ingress-ipv4-qos enable
```

OcNOS NetConf Payload

Here is the OcNOS NetConf Payload to enable QoS Profile on OcNOS.

```
<profiles xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
  <hardware-profile xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
    <filters xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
      <config xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
        <ingress-ipv4-qos/>
      </config>
    </filters>
  </hardware-profile>
</profiles>
```

Validation with NetConf get

There is no equivalent configuration.

Restrictions

None.

Create Classifiers Profiles

Release

This configuration was introduced in OcNOS version 6.5.0.

Configuration

The OpenConfig QoS Classifiers is a profile responsible for handling data traffic classification.
This configuration does not have a direct equivalent object on OcNOS model. To configure classifier on OcNOS model, it needs to be translated to Access Control List (ACL), class-maps and policy-maps objects.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create Classifiers profiles.

```
<qos xmlns="http://openconfig.net/yang/qos">
   <queues>
        <queue>
            <name>q0</name>
            <config>
                <name>q0</name>
                <queue-id>0</queue-id>
            </config>
        </queue>
        <queue>
            <name>q1</name>
            <config>
                <name>q1</name>
                <queue-id>1</queue-id>
            </config>
        </queue>
    </queues>
    <queue-management-profiles>
        <queue-management-profile>
            <name>q0</name>
            <config>
                <name>q0</name>
            </config>
            <wred>
                <uniform>
                    <config>
                        <min-threshold>128000</min-threshold>
                        <max-threshold>256000</max-threshold>
                    </config>
                </uniform>
            </wred>
        </queue-management-profile>
        <queue-management-profile>
            <name>q1</name>
            <config>
                <name>q1</name>
```

```
                </config>
                <wred>
                    <uniform>
                        <config>
                            <min-threshold>256000</min-threshold>
                            <max-threshold>512000</max-threshold>
                        </config>
                    </uniform>
                </wred>
            </queue-management-profile>
        </queue-management-profiles>
        <forwarding-groups>
            <forwarding-group>
                <name>q0</name>
                <config>
                    <name>q0</name>
                    <output-queue>q0</output-queue>
                </config>
            </forwarding-group>
        </forwarding-groups>
        <classifiers>
            <classifier>
                <name>IN_CUSTOMERIF</name>
                <config>
                    <name>IN_CUSTOMERIF</name>
                    <type>IPV4</type>
                </config>
                <terms>
                    <term>
                        <id>10</id>
                        <config>
                            <id>10</id>
                        </config>
                        <conditions>
                            <ipv4>
                                <config>
                                    <source-address>1.1.1.1/24</source-address>
                                    <destination-address>2.2.2.2/24</destination-
address>
                                    <dscp>af21</dscp>
                                </config>
                            </ipv4>
                        </conditions>
                        <actions>
                            <config>
                                <target-group>q0</target-group>
                            </config>
                        </actions>
                    </term>
                    <term>
                        <id>20</id>
                        <config>
                            <id>20</id>
                        </config>
                        <conditions>
                            <ipv4>
                                <config>
```

```
                                    <source-address>3.3.3.3/24</source-address>
                                    <destination-address>4.4.4.4/24</destination-
address>
                                    <dscp>26</dscp>
                                </config>
                            </ipv4>
                        </conditions>
                        <actions>
                            <config>
                                <target-group>q1</target-group>
                            </config>
                        </actions>
                    </term>
                </terms>
            </classifier>
        </classifiers>
    </qos>
```

OcNOS CLI command

The below CLI command is used to create Classifiers profiles for handling data traffic classification.

```
qos enable
!
ip access-list IN_CUSTOMERIF$10
 1 permit tcp 1.1.1.0/24 2.2.2.0/24 dscp af21
ip access-list IN_CUSTOMERIF$20
 1 permit tcp 3.3.3.0/24 4.4.4.0/24 dscp af31
!
class-map type qos match-any IN_CUSTOMERIF$10
 match access-group IN_CUSTOMERIF$10
!
class-map type qos match-any IN_CUSTOMERIF$20
 match access-group IN_CUSTOMERIF$20
!
policy-map type qos IN_CUSTOMERIF
 class type qos IN_CUSTOMERIF$10
  set queue 0
  exit
 class type qos IN_CUSTOMERIF$20
  set queue 1
  exit
!
```

OcNOS NetConf Payload

Here is a sample OcNOS Netconf Payload to create Classifiers profiles for handling data traffic classification.

```
          <acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
        <acl-sets>
          <acl-set>
            <name>IN_CUSTOMERIF$10</name>
            <type>ip</type>
            <config>
              <name>IN_CUSTOMERIF$10</name>
              <type>ip</type>
```

```
        </config>
        <acl-entries>
          <acl-entry>
            <sequence-id>1</sequence-id>
            <config>
              <sequence-id>1</sequence-id>
            </config>
            <ipv4>
              <config>
                <forwarding-action>permit</forwarding-action>
                <source-address>1.1.1.0/24</source-address>
                <destination-address>2.2.2.0/24</destination-address>
                <dscp>af21</dscp>
                <protocol-tcp/>
              </config>
            </ipv4>
          </acl-entry>
        </acl-entries>
      </acl-set>
      <acl-set>
        <name>IN_CUSTOMERIF$20</name>
        <type>ip</type>
        <config>
          <name>IN_CUSTOMERIF$20</name>
          <type>ip</type>
        </config>
        <acl-entries>
          <acl-entry>
            <sequence-id>1</sequence-id>
            <config>
              <sequence-id>1</sequence-id>
            </config>
            <ipv4>
              <config>
                <forwarding-action>permit</forwarding-action>
                <source-address>3.3.3.0/24</source-address>
                <destination-address>4.4.4.0/24</destination-address>
                <dscp>af31</dscp>
                <protocol-tcp/>
              </config>
            </ipv4>
          </acl-entry>
        </acl-entries>
      </acl-set>
    </acl-sets>
  </acl>
  <qos xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-qos">
    <global>
      <config>
        <enable-qos>enable</enable-qos>
      </config>
      <class-maps>
        <class-map>
          <name>IN_CUSTOMERIF$10</name>
          <config>
            <name>IN_CUSTOMERIF$10</name>
            <type>qos</type>
```

```
              <match-criteria>match-any</match-criteria>
            </config>
            <match-any-conditions>
              <config>
                <access-control-list-name>IN_CUSTOMERIF$10</access-control-
list-name>
              </config>
            </match-any-conditions>
          </class-map>
          <class-map>
            <name>IN_CUSTOMERIF$20</name>
            <config>
              <name>IN_CUSTOMERIF$20</name>
              <type>qos</type>
              <match-criteria>match-any</match-criteria>
            </config>
            <match-any-conditions>
              <config>
                <access-control-list-name>IN_CUSTOMERIF$20</access-control-
list-name>
              </config>
            </match-any-conditions>
          </class-map>
        </class-maps>
        <policy-maps>
          <policy-map>
            <policy-map-name>IN_CUSTOMERIF</policy-map-name>
            <config>
              <policy-map-name>IN_CUSTOMERIF</policy-map-name>
              <type>qos</type>
            </config>
            <classes>
              <class>
                <class-map-name>IN_CUSTOMERIF$10</class-map-name>
                <config>
                  <class-map-name>IN_CUSTOMERIF$10</class-map-name>
                  <type>qos</type>
                </config>
                <qos-mode>
                  <config>
                    <queue-id>0</queue-id>
                  </config>
                </qos-mode>
              </class>
              <class>
                <class-map-name>IN_CUSTOMERIF$20</class-map-name>
                <config>
                  <class-map-name>IN_CUSTOMERIF$20</class-map-name>
                  <type>qos</type>
                </config>
                <qos-mode>
                  <config>
                    <queue-id>1</queue-id>
                  </config>
                </qos-mode>
              </class>
            </classes>
```

```
      </policy-map>
    </policy-maps>
  </global>
</qos>
```

Validation with NetConf get

Here is the NetConf validation response that provides detailed information about creating Classifiers profiles.

```
  <qos xmlns="http://openconfig.net/yang/qos">
<classifiers>
  <classifier>
    <name>IN_CUSTOMERIF</name>
    <config>
      <name>IN_CUSTOMERIF</name>
      <type>IPV4</type>
    </config>
    <state>
      <name>IN_CUSTOMERIF</name>
      <type>IPV4</type>
    </state>
    <terms>
      <term>
        <id>10</id>
        <config>
          <id>10</id>
        </config>
        <state>
          <id>10</id>
        </state>
        <actions>
          <config>
            <target-group>q0</target-group>
          </config>
          <state>
            <target-group>q0</target-group>
          </state>
        </actions>
        <conditions>
          <ipv4>
            <config>
              <source-address>1.1.1.0/24</source-address>
              <destination-address>2.2.2.0/24</destination-address>
              <dscp>18</dscp>
            </config>
            <state>
              <source-address>1.1.1.0/24</source-address>
              <destination-address>2.2.2.0/24</destination-address>
              <dscp>18</dscp>
            </state>
          </ipv4>
        </conditions>
      </term>
      <term>
        <id>20</id>
        <config>
          <id>20</id>
```

```
          </config>
          <state>
            <id>20</id>
          </state>
          <actions>
            <config>
              <target-group>q1</target-group>
            </config>
            <state>
              <target-group>q1</target-group>
            </state>
          </actions>
          <conditions>
            <ipv4>
              <config>
                <source-address>3.3.3.0/24</source-address>
                <destination-address>4.4.4.0/24</destination-address>
                <dscp>26</dscp>
              </config>
              <state>
                <source-address>3.3.3.0/24</source-address>
                <destination-address>4.4.4.0/24</destination-address>
                <dscp>26</dscp>
              </state>
            </ipv4>
          </conditions>
        </term>
      </terms>
    </classifier>
  </classifiers>
  <queue-management-profiles>
    <queue-management-profile>
      <name>q0</name>
      <config>
        <name>q0</name>
      </config>
      <state>
        <name>q0</name>
      </state>
      <wred>
        <uniform>
          <config>
            <min-threshold>128000</min-threshold>
            <max-threshold>256000</max-threshold>
          </config>
          <state>
            <min-threshold>128000</min-threshold>
            <max-threshold>256000</max-threshold>
          </state>
        </uniform>
      </wred>
    </queue-management-profile>
    <queue-management-profile>
      <name>q1</name>
      <config>
        <name>q1</name>
      </config>
```

```
        <state>
          <name>q1</name>
        </state>
        <wred>
          <uniform>
            <config>
              <min-threshold>256000</min-threshold>
              <max-threshold>512000</max-threshold>
            </config>
            <state>
              <min-threshold>256000</min-threshold>
              <max-threshold>512000</max-threshold>
            </state>
          </uniform>
        </wred>
      </queue-management-profile>
    </queue-management-profiles>
    <forwarding-groups>
      <forwarding-group>
        <name>q0</name>
        <config>
          <name>q0</name>
          <output-queue>q0</output-queue>
        </config>
        <state>
          <name>q0</name>
          <output-queue>q0</output-queue>
        </state>
      </forwarding-group>
    </forwarding-groups>
    <queues>
      <queue>
        <name>q0</name>
        <config>
          <name>q0</name>
          <queue-id>0</queue-id>
        </config>
        <state>
          <name>q0</name>
          <queue-id>0</queue-id>
        </state>
      </queue>
      <queue>
        <name>q1</name>
        <config>
          <name>q1</name>
          <queue-id>1</queue-id>
        </config>
        <state>
          <name>q1</name>
          <queue-id>1</queue-id>
        </state>
      </queue>
    </queues>
  </qos>
```

Restrictions

All the paths mentioned below have restrictions:

- `/qos/interfaces/interface/output/classifiers`
  This association is not supported on OcNOS model.
- `/qos/classifiers/classifier/terms/term/actions/remark`
  This association is not supported on OcNOS model.
- Path `/qos/queue-management-profiles` is available on OpenConfig versions above 1.0.0.
- Path `/qos/queues` was restructured on OpenConfig versions above 1.0.0.

Create Forwarding-groups Profiles

Release

This configuration was introduced in OcNOS version 6.5.0.

Configuration

The OpenConfig profile Forwarding-group does not have an equivalent model on OcNOS model, so this object is stored inside Translation Auxiliary Database.

The object name on OpenConfig format allows any string value. However on OcNOS, all forwarding-profiles have fixed names that follow the pattern **q[0-7].** Hence, the Forwarding-groups leaf name must follow this pattern.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create Forwarding-groups profiles.

```
      <qos xmlns="http://openconfig.net/yang/qos">
    <forwarding-groups>
      <forwarding-group>
        <name>q0</name>
        <config>
          <name>q0</name>
          <output-queue>q0</output-queue>iority>
        </config>
      </forwarding-group>
    </forwarding-groups>
  </qos>
```

OcNOS CLI command

There is no equivalent configuration.

OcNOS NetConf Payload

There is no equivalent configuration.

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating Forwarding-groups profiles.

```
<qos xmlns="http://openconfig.net/yang/qos">
<forwarding-groups>
<forwarding-group>
<name>q0</name>
<config>
<name>q0</name>
<output-queue>q0</output-queue>
</config>
<state>
<name>q0</name>
<output-queue>q0</output-queue>
</state>
</forwarding-group>
</forwarding-groups>
</qos>
```

Restrictions

- Paths `/qos/forwarding-groups/forwarding-group/name` and `/qos/forwarding-groups/forwarding-group/config/name` have fixed names that follow the pattern **q[0-7].**

Create Queues and Queue-Management-profiles Entries

Release

This configuration was introduced in OcNOS version 6.5.0.

Configuration

The OpenConfig profiles **Queues** and **Queue-Management-Profiles** do not have an equivalent model on OcNOS, so this object is stored inside Translation Auxiliary Database.
These OpenConfig profiles are used to configure on OcNOS model **random-detect** configuration from policy-map type queuing object.

The object name on OpenConfig format allows any string value. However on OcNOS, they have fixed names that follow the pattern **q[0-7].** Hence the **Queues** and **Queue-Management-Profiles** leaf name must follow this pattern.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create Queues and Queue-Management-profiles entries.

```
<qos xmlns="http://openconfig.net/yang/qos">
   <queues>
        <queue>
            <name>q0</name>
            <config>
                <name>q0</name>
```

```
                <queue-id>0</queue-id>
            </config>
        </queue>
        <queue>
            <name>q1</name>
            <config>
                <name>q1</name>
                <queue-id>1</queue-id>
            </config>
        </queue>
    </queues>
    <queue-management-profiles>
        <queue-management-profile>
            <name>q0</name>
            <config>
                <name>q0</name>
            </config>
            <wred>
                <uniform>
                    <config>
                        <min-threshold>128000</min-threshold>
                        <max-threshold>256000</max-threshold>
                    </config>
                </uniform>
            </wred>
        </queue-management-profile>
        <queue-management-profile>
            <name>q1</name>
            <config>
                <name>q1</name>
            </config>
            <wred>
                <uniform>
                    <config>
                        <min-threshold>256000</min-threshold>
                        <max-threshold>512000</max-threshold>
                    </config>
                </uniform>
            </wred>
        </queue-management-profile>
    </queue-management-profiles>
</qos>
```

OcNOS CLI command

There is no equivalent configuration.

OcNOS NetConf Payload

There is no equivalent configuration.

Validation with NetConf get

Here is the NetConf response that gives detailed information about creating Queues and Queue-Management-profiles entries.

```
   <qos xmlns="http://openconfig.net/yang/qos">
<queues>
  <queue>
    <name>q0</name>
    <config>
      <name>q0</name>
      <queue-id>0</queue-id>
    </config>
    <state>
      <name>q0</name>
      <queue-id>0</queue-id>
    </state>
  </queue>
</queues>
<queue-management-profiles>
  <queue-management-profile>
    <name>q0</name>
    <config>
      <name>q0</name>
    </config>
    <state>
      <name>q0</name>
    </state>
    <wred>
      <uniform>
        <config>
          <min-threshold>128000</min-threshold>
          <max-threshold>256000</max-threshold>
        </config>
        <state>
          <min-threshold>128000</min-threshold>
          <max-threshold>256000</max-threshold>
        </state>
      </uniform>
    </wred>
  </queue-management-profile>
  <queue-management-profile>
    <name>q1</name>
    <config>
      <name>q1</name>
    </config>
    <state>
      <name>q1</name>
    </state>
    <wred>
      <uniform>
        <config>
          <min-threshold>256000</min-threshold>
          <max-threshold>512000</max-threshold>
        </config>
        <state>
          <min-threshold>256000</min-threshold>
```

```
              <max-threshold>512000</max-threshold>
            </state>
          </uniform>
        </wred>
      </queue-management-profile>
    </queue-management-profiles>
  </qos>
```

Restrictions

- Path `/qos/queue-management-profiles` is available on OpenConfig versions above 1.0.0.
- Path `/qos/queues` was restructured on OpenConfig versions above 1.0.0.
- The path `/qos/interfaces/interface/output/queues` have its association that is not supported on OcNOS models.
- The path `/qos/interfaces/interface/input/queues/queue[name]/config/queue-management-profile` have its association that is not supported on OcNOS models.
- The paths below have fixed leaf names that follow the pattern **q[0-7]**.
  - `/qos/queues/queue/name`
  - `/qos/queues/queue/config/name`
  - `/qos/queue-management-profiles/queue-management-profile/name`
  - `/qos/queue-management-profiles/queue-management-profile/config/name`

Create Scheduler-policies Entries

Release

This configuration was introduced in OcNOS version 6.5.0.

Configuration

On DC platforms, there are limitations to configure QoS WRED and tail-drops data together. Hence, the Scheduler-policies entries is divided into ones configured with leaf `/openconfig-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-bytes` container, and the ones that do not have this leaf.

The scheduler-policies without leaf `/openconfig-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-bytes`, configures the WRED configuration on OcNOS and sets data based on OpenConfig `queue-management-profiles` container.

The scheduler-policies with leaf `/openconfig-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-bytes`, configures the tail-drops configuration on OcNOS. It is based on data set OpenConfig leaf `/openconfig-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-bytes` to configure OcNOS leaf `/ipi-qos:qos/global/policy-maps/policy-map/classes/class/queue-mode/tail-drops/tail-drop/config/max-threshold`.

The scheduler-policies input configuration for OpenConfig XPath `/oc-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/inputs/input/config` now has its leaf `queue` as mandatory in operations "**create**", "**delete**", "**remove**" and "**merge**". This is because the translation mapping done on OcNOS

datamodel to XPath `/qos/global/policy-maps/policy-map/classes/class` and the queue leaf points to `class-map-name` leaf on OcNOS. If this condition is not addressed, the Translation Framework throws an error when the OpenConfig payload is applied.

Create Scheduler-policies entries without leaf max-queue-depth-bytes

Release

This configuration was introduced in OcNOS version 6.5.0.

Configuration

On DC platforms, there are limitations to configure QoS WRED and tail-drops data together. Hence, the Scheduler-policies entries is divided into ones configured with leaf `/openconfig-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-bytes` container, and the ones that do not have this leaf.

The scheduler-policies without leaf `/openconfig-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-bytes`, configures the WRED configuration on OcNOS and sets data based on OpenConfig `queue-management-profiles` container.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create Scheduler-policies entries without leaf max-queue-depth-bytes.

```
<qos xmlns="http://openconfig.net/yang/qos">
   <queues>
        <queue>
            <name>q0</name>
            <config>
                <name>q0</name>
                <queue-id>0</queue-id>
            </config>
        </queue>
        <queue>
            <name>q1</name>
            <config>
                <name>q1</name>
                <queue-id>1</queue-id>
            </config>
        </queue>
    </queues>
    <queue-management-profiles>
        <queue-management-profile>
            <name>q0</name>
            <config>
                <name>q0</name>
            </config>
            <wred>
                <uniform>
```

```
                    <config>
                        <min-threshold>128000</min-threshold>
                        <max-threshold>256000</max-threshold>
                    </config>
                </uniform>
            </wred>
        </queue-management-profile>
        <queue-management-profile>
            <name>q1</name>
            <config>
                <name>q1</name>
            </config>
            <wred>
                <uniform>
                    <config>
                        <min-threshold>256000</min-threshold>
                        <max-threshold>512000</max-threshold>
                    </config>
                </uniform>
            </wred>
        </queue-management-profile>
    </queue-management-profiles>
    <forwarding-groups>
        <forwarding-group>
            <name>q0</name>
            <config>
                <name>q0</name>
                <output-queue>q0</output-queue>
            </config>
        </forwarding-group>
    </forwarding-groups>
    <classifiers>
        <classifier>
            <name>IN_CUSTOMERIF</name>
            <config>
                <name>IN_CUSTOMERIF</name>
                <type>IPV4</type>
            </config>
            <terms>
                <term>
                    <id>10</id>
                    <config>
                        <id>10</id>
                    </config>
                    <conditions>
                        <ipv4>
                            <config>
                                <source-address>1.1.1.1/24</source-address>
                                <destination-address>2.2.2.2/24</destination-
address>
                                <dscp>af21</dscp>
                            </config>
                        </ipv4>
                    </conditions>
                    <actions>
                        <config>
                            <target-group>q0</target-group>
```

```
                        </config>
                    </actions>
                </term>
                <term>
                    <id>20</id>
                    <config>
                        <id>20</id>
                    </config>
                    <conditions>
                        <ipv4>
                            <config>
                                <source-address>3.3.3.3/24</source-address>
                                <destination-address>4.4.4.4/24</destination-
address>
                                <dscp>26</dscp>
                            </config>
                        </ipv4>
                    </conditions>
                    <actions>
                        <config>
                            <target-group>q1</target-group>
                        </config>
                    </actions>
                </term>
            </terms>
        </classifier>
    </classifiers>
    <scheduler-policies>
        <scheduler-policy>
            <name>SCHEDULER_POLICY_1</name>
            <config>
                <name>SCHEDULER_POLICY_1</name>
            </config>
            <schedulers>
                <scheduler>
                    <sequence>10</sequence>
                    <config>
                        <sequence>10</sequence>
                        <type>oc-qos-
types:QOS_SCHEDULER_TYPE:ONE_RATE_TWO_COLOR</type>
                        <priority>STRICT</priority>
                    </config>
                    <inputs>
                        <input>
                            <id>SCHEDULER_POLICY_AF1</id>
                            <config>
                                <id>SCHEDULER_POLICY_AF1</id>
                                <input-type>QUEUE</input-type>
                                <queue>q0</queue>
                                <weight>5</weight>
                            </config>
                        </input>
                    </inputs>
                </scheduler>
            </schedulers>
        </scheduler-policy>
    </scheduler-policies>
```

```
</qos>
```

OcNOS CLI command

The below CLI command is used to create Scheduler-policies entries without leaf max-queue-depth-bytes.

```
qos enable
!
ip access-list IN_CUSTOMERIF$10
 1 permit tcp 1.1.1.0/24 2.2.2.0/24 dscp af21
ip access-list IN_CUSTOMERIF$20
 1 permit tcp 3.3.3.0/24 4.4.4.0/24 dscp af31
!
class-map type qos match-any IN_CUSTOMERIF$10
 match access-group IN_CUSTOMERIF$10
!
class-map type qos match-any IN_CUSTOMERIF$20
 match access-group IN_CUSTOMERIF$20
!
policy-map type qos IN_CUSTOMERIF
 class type qos IN_CUSTOMERIF$10
  set queue 0
  exit
 class type qos IN_CUSTOMERIF$20
  set queue 1
  exit
!
policy-map type queuing default SCHEDULER_POLICY_1
 class type queuing default q0
  wrr-queue weight 5
  random-detect min-threshold 128000 max-threshold 256000 bytes drop-
probability 80
  exit
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create Scheduler-policies entries without leaf max-queue-depth-bytes.

```
<acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
  <acl-sets>
    <acl-set>
      <name>IN_CUSTOMERIF$10</name>
      <type>ip</type>
      <config>
        <name>IN_CUSTOMERIF$10</name>
        <type>ip</type>
      </config>
      <acl-entries>
        <acl-entry>
          <sequence-id>1</sequence-id>
          <config>
            <sequence-id>1</sequence-id>
          </config>
          <ipv4>
            <config>
```

```
              <forwarding-action>permit</forwarding-action>
              <source-address>1.1.1.0/24</source-address>
              <destination-address>2.2.2.0/24</destination-address>
              <dscp>af21</dscp>
              <protocol-tcp/>
            </config>
          </ipv4>
        </acl-entry>
      </acl-entries>
    </acl-set>
    <acl-set>
      <name>IN_CUSTOMERIF$20</name>
      <type>ip</type>
      <config>
        <name>IN_CUSTOMERIF$20</name>
        <type>ip</type>
      </config>
      <acl-entries>
        <acl-entry>
          <sequence-id>1</sequence-id>
          <config>
            <sequence-id>1</sequence-id>
          </config>
          <ipv4>
            <config>
              <forwarding-action>permit</forwarding-action>
              <source-address>3.3.3.0/24</source-address>
              <destination-address>4.4.4.0/24</destination-address>
              <dscp>af31</dscp>
              <protocol-tcp/>
            </config>
          </ipv4>
        </acl-entry>
      </acl-entries>
    </acl-set>
  </acl-sets>
</acl>
<qos xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-qos">
  <global>
    <config>
      <enable-qos>enable</enable-qos>
      <statistics-enabled/>
    </config>
    <class-maps>
      <class-map>
        <name>IN_CUSTOMERIF$10</name>
        <config>
          <name>IN_CUSTOMERIF$10</name>
          <type>qos</type>
          <match-criteria>match-any</match-criteria>
        </config>
        <match-any-conditions>
          <config>
            <access-control-list-name>IN_CUSTOMERIF$10</access-control-list-
name>
          </config>
        </match-any-conditions>
```

```
      </class-map>
      <class-map>
        <name>IN_CUSTOMERIF$20</name>
        <config>
          <name>IN_CUSTOMERIF$20</name>
          <type>qos</type>
          <match-criteria>match-any</match-criteria>
        </config>
        <match-any-conditions>
          <config>
            <access-control-list-name>IN_CUSTOMERIF$20</access-control-list-
name>
          </config>
        </match-any-conditions>
      </class-map>
    </class-maps>
    <policy-maps>
      <policy-map>
        <policy-map-name>IN_CUSTOMERIF</policy-map-name>
        <config>
          <policy-map-name>IN_CUSTOMERIF</policy-map-name>
          <type>qos</type>
        </config>
        <classes>
          <class>
            <class-map-name>IN_CUSTOMERIF$10</class-map-name>
            <config>
              <class-map-name>IN_CUSTOMERIF$10</class-map-name>
              <type>qos</type>
            </config>
            <qos-mode>
              <config>
                <queue-id>0</queue-id>
              </config>
            </qos-mode>
          </class>
          <class>
            <class-map-name>IN_CUSTOMERIF$20</class-map-name>
            <config>
              <class-map-name>IN_CUSTOMERIF$20</class-map-name>
              <type>qos</type>
            </config>
            <qos-mode>
              <config>
                <queue-id>1</queue-id>
              </config>
            </qos-mode>
          </class>
        </classes>
      </policy-map>
      <policy-map>
        <policy-map-name>SCHEDULER_POLICY_1</policy-map-name>
        <config>
          <policy-map-name>SCHEDULER_POLICY_1</policy-map-name>
          <type>queuing-default</type>
        </config>
        <classes>
```

```
            <class>
              <class-map-name>q0</class-map-name>
              <config>
                <class-map-name>q0</class-map-name>
                <type>queuing-default</type>
              </config>
              <queue-mode>
                <config>
                  <weighted-round-robin-queue-weight>5</weighted-round-robin-
queue-weight>
                </config>
                <red>
                  <wred>
                    <config>
                      <min-threshold>128000</min-threshold>
                      <max-threshold>256000</max-threshold>
                      <threshold-unit>bytes</threshold-unit>
                      <drop-probability>80</drop-probability>
                    </config>
                  </wred>
                </red>
              </queue-mode>
            </class>
          </classes>
        </policy-map>
        <policy-map>
          <policy-map-name>subif-default-out-policy</policy-map-name>
          <config>
            <policy-map-name>subif-default-out-policy</policy-map-name>
            <type>queuing-default</type>
          </config>
          <classes>
            <class>
              <class-map-name>q1</class-map-name>
              <config>
                <class-map-name>q1</class-map-name>
                <type>queuing-default</type>
              </config>
              <queue-mode>
                <config>
                  <priority-level>0</priority-level>
                </config>
              </queue-mode>
            </class>
            <class>
              <class-map-name>q2</class-map-name>
              <config>
                <class-map-name>q2</class-map-name>
                <type>queuing-default</type>
              </config>
              <queue-mode>
                <config>
                  <priority-level>0</priority-level>
                </config>
              </queue-mode>
            </class>
            <class>
```

```
  <class-map-name>q3</class-map-name>
  <config>
    <class-map-name>q3</class-map-name>
    <type>queuing-default</type>
  </config>
  <queue-mode>
    <config>
      <priority-level>0</priority-level>
    </config>
  </queue-mode>
</class>
<class>
  <class-map-name>q4</class-map-name>
  <config>
    <class-map-name>q4</class-map-name>
    <type>queuing-default</type>
  </config>
  <queue-mode>
    <config>
      <priority-level>0</priority-level>
    </config>
  </queue-mode>
</class>
<class>
  <class-map-name>q5</class-map-name>
  <config>
    <class-map-name>q5</class-map-name>
    <type>queuing-default</type>
  </config>
  <queue-mode>
    <config>
      <priority-level>0</priority-level>
    </config>
  </queue-mode>
</class>
<class>
  <class-map-name>q6</class-map-name>
  <config>
    <class-map-name>q6</class-map-name>
    <type>queuing-default</type>
  </config>
  <queue-mode>
    <config>
      <priority-level>0</priority-level>
    </config>
  </queue-mode>
</class>
<class>
  <class-map-name>q7</class-map-name>
  <config>
    <class-map-name>q7</class-map-name>
    <type>queuing-default</type>
  </config>
  <queue-mode>
    <config>
      <priority-level>0</priority-level>
    </config>
```

```
            </queue-mode>
          </class>
        </classes>
      </policy-map>
    </policy-maps>
  </global>
</qos>
```

Validation with NetConf get

Here is the NetConf response that gives detailed information about creating Scheduler-policies entries without leaf max-queue-depth-bytes.

```
<qos xmlns="http://openconfig.net/yang/qos">
  <classifiers>
    <classifier>
      <name>IN_CUSTOMERIF</name>
      <config>
        <name>IN_CUSTOMERIF</name>
        <type>IPV4</type>
      </config>
      <state>
        <name>IN_CUSTOMERIF</name>
        <type>IPV4</type>
      </state>
      <terms>
        <term>
          <id>10</id>
          <config>
            <id>10</id>
          </config>
          <state>
            <id>10</id>
          </state>
          <actions>
            <config>
              <target-group>q0</target-group>
            </config>
            <state>
              <target-group>q0</target-group>
            </state>
          </actions>
          <conditions>
            <ipv4>
              <config>
                <source-address>1.1.1.0/24</source-address>
                <destination-address>2.2.2.0/24</destination-address>
                <dscp>18</dscp>
              </config>
              <state>
                <source-address>1.1.1.0/24</source-address>
                <destination-address>2.2.2.0/24</destination-address>
                <dscp>18</dscp>
              </state>
            </ipv4>
          </conditions>
```

```
        </term>
        <term>
          <id>20</id>
          <config>
            <id>20</id>
          </config>
          <state>
            <id>20</id>
          </state>
          <actions>
            <config>
              <target-group>q1</target-group>
            </config>
            <state>
              <target-group>q1</target-group>
            </state>
          </actions>
          <conditions>
            <ipv4>
              <config>
                <source-address>3.3.3.0/24</source-address>
                <destination-address>4.4.4.0/24</destination-address>
                <dscp>26</dscp>
              </config>
              <state>
                <source-address>3.3.3.0/24</source-address>
                <destination-address>4.4.4.0/24</destination-address>
                <dscp>26</dscp>
              </state>
            </ipv4>
          </conditions>
        </term>
      </terms>
    </classifier>
  </classifiers>
  <scheduler-policies>
    <scheduler-policy>
      <name>SCHEDULER_POLICY_1</name>
      <config>
        <name>SCHEDULER_POLICY_1</name>
      </config>
      <state>
        <name>SCHEDULER_POLICY_1</name>
      </state>
      <schedulers>
        <scheduler>
          <sequence>10</sequence>
          <config>
            <sequence>10</sequence>
            <type
              xmlns:oc-qos-types="http://openconfig.net/yang/qos-types">oc-
qos-types:ONE_RATE_TWO_COLOR</type>
            <priority>STRICT</priority>
          </config>
          <inputs>
            <input>
              <id>SCHEDULER_POLICY_AF1</id>
```

```
              <config>
                <id>SCHEDULER_POLICY_AF1</id>
                <queue>q0</queue>
                <weight>5</weight>
                <input-type>QUEUE</input-type>
              </config>
              <state>
                <weight>5</weight>
                <id>SCHEDULER_POLICY_AF1</id>
                <queue>q0</queue>
                <input-type>QUEUE</input-type>
              </state>
            </input>
          </inputs>
          <state>
            <sequence>10</sequence>
            <type
              xmlns:oc-qos-types="http://openconfig.net/yang/qos-types">oc-
qos-types:ONE_RATE_TWO_COLOR</type>
            <priority>STRICT</priority>
          </state>
        </scheduler>
      </schedulers>
    </scheduler-policy>
  </scheduler-policies>
  <queue-management-profiles>
    <queue-management-profile>
      <name>q0</name>
      <config>
        <name>q0</name>
      </config>
      <state>
        <name>q0</name>
      </state>
      <wred>
        <uniform>
          <config>
            <min-threshold>128000</min-threshold>
            <max-threshold>256000</max-threshold>
            <weight>20</weight>
            <max-threshold>90</max-threshold>
          </config>
          <state>
            <min-threshold>128000</min-threshold>
            <max-threshold>256000</max-threshold>
            <weight>20</weight>
            <max-threshold>90</max-threshold>
          </state>
        </uniform>
      </wred>
    </queue-management-profile>
    <queue-management-profile>
      <name>q1</name>
      <config>
        <name>q1</name>
      </config>
      <state>
```

```
        <name>q1</name>
      </state>
      <wred>
        <uniform>
          <config>
            <min-threshold>256000</min-threshold>
            <max-threshold>512000</max-threshold>
            <weight>10</weight>
            <max-threshold>70</max-threshold>
          </config>
          <state>
            <min-threshold>256000</min-threshold>
            <max-threshold>512000</max-threshold>
            <weight>10</weight>
            <max-threshold>70</max-threshold>
          </state>
        </uniform>
      </wred>
    </queue-management-profile>
  </queue-management-profiles>
  <forwarding-groups>
    <forwarding-group>
      <name>q0</name>
      <config>
        <name>q0</name>
        <output-queue>q0</output-queue>
        <fabric-priority>128</fabric-priority>
      </config>
      <state>
        <name>q0</name>
        <output-queue>q0</output-queue>
        <fabric-priority>128</fabric-priority>
      </state>
    </forwarding-group>
  </forwarding-groups>
  <queues>
    <queue>
      <name>q0</name>
      <config>
        <name>q0</name>
        <queue-id>0</queue-id>
      </config>
      <state>
        <name>q0</name>
        <queue-id>0</queue-id>
      </state>
    </queue>
    <queue>
      <name>q1</name>
      <config>
        <name>q1</name>
        <queue-id>1</queue-id>
      </config>
      <state>
        <name>q1</name>
        <queue-id>1</queue-id>
      </state>
```

```
      </queue>
    </queues>
  </qos>
```

Restrictions

- Path `/qos/queue-management-profiles` is available on OpenConfig versions above 1.0.0.
- Path `/qos/queues` has been restructured on OpenConfig versions above 1.0.0.
- The only valid value for path `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/config/priority` is **STRICT**.
- The leaf name for path `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/inputs/input/config/queue` have fixed names that follow the pattern **q[0-7]**.
- The scheduler-policies input configuration for OpenConfig XPath `/oc-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/inputs/input/config` now has its leaf `queue` as mandatory in operations "**create**", "**delete**", "**remove**" and "**merge**". This is because the translation mapping done on OcNOS datamodel to XPath `/qos/global/policy-maps/policy-map/classes/class` and the queue leaf points to `class-map-name` leaf on OcNOS. If this condition is not addressed, the Translation Framework throws an error when the OpenConfig payload is applied.
- All the paths mentioned below have restrictions:
  - `/qos/interfaces/interface/input/scheduler-policy`
    This association is not valid on OcNOS and is not supported.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/output`
    This association is not valid on OcNOS and is not supported.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/bc`
    This association is not valid on OcNOS and is not supported.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/cir-pct`
    This association is not valid on OcNOS and is not supported..
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler`
    This list has a fixed max-element as one entry.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/config/type`
    This configuration has a fixed value: **ONE_RATE_TWO_COLOR**.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/inputs/input/config/input-type`
    This configuration has a fixed value: **QUEUE**.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/cir-pct-remaining`
    This association is not valid on OcNOS and is not supported.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/queuing-behavior`
    This configuration has a fixed value: **SHAPE**.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-packets`
    This association is not valid on OcNOS and is not supported.

- `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-percent`
  This association is not valid on OcNOS and is not supported..
- `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/conform-action`
  This association is not valid on OcNOS and is not supported.
- `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/exceed-action`
  This association is not valid on OcNOS and is not supported..
- `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/two-rate-three-color`
  This association is not valid on OcNOS and is not supported.

Create Scheduler-policies Entries with leaf max-queue-depth-bytes

Release

This configuration was introduced in OcNOS version 6.5.0.

Configuration

On DC platforms, there are limitations to configure QoS WRED and tail-drops data together. Hence, the Scheduler-policies entries is divided into ones configured with leaf `/openconfig-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-bytes` container, and the ones that do not have this leaf.

The scheduler-policies with leaf `/openconfig-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-bytes`, configures the tail-drops configuration on OcNOS. It is based on data set OpenConfig leaf `/openconfig-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-bytes` to configure OcNOS leaf `/ipi-qos:qos/global/policy-maps/policy-map/classes/class/queue-mode/tail-drops/tail-drop/config/max-threshold`.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create Scheduler-policies entries with leaf max-queue-depth-bytes.

```
<qos xmlns="http://openconfig.net/yang/qos">
   <queues>
        <queue>
            <name>q0</name>
            <config>
                <name>q0</name>
                <queue-id>0</queue-id>
            </config>
        </queue>
        <queue>
            <name>q1</name>
            <config>
                <name>q1</name>
                <queue-id>1</queue-id>
```

```
        </config>
    </queue>
</queues>
<queue-management-profiles>
    <queue-management-profile>
        <name>q0</name>
        <config>
            <name>q0</name>
        </config>
        <wred>
            <uniform>
                <config>
                    <min-threshold>128000</min-threshold>
                    <max-threshold>256000</max-threshold>
                </config>
            </uniform>
        </wred>
    </queue-management-profile>
    <queue-management-profile>
        <name>q1</name>
        <config>
            <name>q1</name>
        </config>
        <wred>
            <uniform>
                <config>
                    <min-threshold>256000</min-threshold>
                    <max-threshold>512000</max-threshold>
                </config>
            </uniform>
        </wred>
    </queue-management-profile>
</queue-management-profiles>
<forwarding-groups>
    <forwarding-group>
        <name>q0</name>
        <config>
            <name>q0</name>
            <output-queue>q0</output-queue>
        </config>
    </forwarding-group>
</forwarding-groups>
<classifiers>
    <classifier>
        <name>IN_CUSTOMERIF</name>
        <config>
            <name>IN_CUSTOMERIF</name>
            <type>IPV4</type>
        </config>
        <terms>
            <term>
                <id>10</id>
                <config>
                    <id>10</id>
                </config>
                <conditions>
                    <ipv4>
```

```
                            <config>
                                <source-address>1.1.1.1/24</source-address>
                                <destination-address>2.2.2.2/24</destination-
address>
                                <dscp>af21</dscp>
                            </config>
                        </ipv4>
                    </conditions>
                    <actions>
                        <config>
                            <target-group>q0</target-group>
                        </config>
                    </actions>
                </term>
                <term>
                    <id>20</id>
                    <config>
                        <id>20</id>
                    </config>
                    <conditions>
                        <ipv4>
                            <config>
                                <source-address>3.3.3.3/24</source-address>
                                <destination-address>4.4.4.4/24</destination-
address>
                                <dscp>26</dscp>
                            </config>
                        </ipv4>
                    </conditions>
                    <actions>
                        <config>
                            <target-group>q1</target-group>
                        </config>
                    </actions>
                </term>
            </terms>
        </classifier>
    </classifiers>
    <scheduler-policies>
      <scheduler-policy>
          <name>SCHEDULER_POLICY_2</name>
          <config>
            <name>SCHEDULER_POLICY_2</name>
          </config>
          <schedulers>
            <scheduler>
              <sequence>20</sequence>
              <config>
                <sequence>20</sequence>
                <type
                  xmlns:oc-qos-types="http://openconfig.net/yang/qos-
types">oc-qos-types:ONE_RATE_TWO_COLOR</type>
                <priority>STRICT</priority>
              </config>
              <inputs>
                <input>
                  <id>SCHEDULER_POLICY_AF1</id>
```

```
                    <config>
                      <id>SCHEDULER_POLICY_AF1</id>
                      <queue>q0</queue>
                      <weight>5</weight>
                      <input-type>QUEUE</input-type>
                    </config>
                  </input>
                  <input>
                    <id>SCHEDULER_POLICY_AF2</id>
                    <config>
                      <id>SCHEDULER_POLICY_AF2</id>
                      <queue>q1</queue>
                      <weight>14</weight>
                      <input-type>QUEUE</input-type>
                    </config>
                  </input>
                </inputs>
                <one-rate-two-color>
                  <config>
                    <max-queue-depth-bytes>64000</max-queue-depth-bytes>
                    <cir>256000000</cir>
                    <queuing-behavior>SHAPE</queuing-behavior>
                  </config>
                </one-rate-two-color>
              </scheduler>
            </schedulers>
          </scheduler-policy>
      </scheduler-policies>
</qos>
```

OcNOS CLI command

The below CLI command is used to create Scheduler-policies entries with leaf max-queue-depth-bytes.

```
qos enable
!
ip access-list IN_CUSTOMERIF$10
 1 permit tcp 1.1.1.0/24 2.2.2.0/24 dscp af21
ip access-list IN_CUSTOMERIF$20
 1 permit tcp 3.3.3.0/24 4.4.4.0/24 dscp af31
!
class-map type qos match-any IN_CUSTOMERIF$10
 match access-group IN_CUSTOMERIF$10
!
class-map type qos match-any IN_CUSTOMERIF$20
 match access-group IN_CUSTOMERIF$20
!
policy-map type qos IN_CUSTOMERIF
 class type qos IN_CUSTOMERIF$10
  set queue 0
  exit
 class type qos IN_CUSTOMERIF$20
  set queue 1
  exit
!
policy-map type queuing default SCHEDULER_POLICY_2
 class type queuing default q0
```

```
  shape 256000000 kbps
  wrr-queue weight 5
  queue-limit 64000 bytes
  exit
 class type queuing default q1
  shape 256000000 kbps
  wrr-queue weight 14
  queue-limit 64000 bytes
  exit
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create Scheduler-policies entries with leaf max-queue-depth-bytes.

```
<acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
  <acl-sets>
    <acl-set>
      <name>IN_CUSTOMERIF$10</name>
      <type>ip</type>
      <config>
        <name>IN_CUSTOMERIF$10</name>
        <type>ip</type>
      </config>
      <acl-entries>
        <acl-entry>
          <sequence-id>1</sequence-id>
          <config>
            <sequence-id>1</sequence-id>
          </config>
          <ipv4>
            <config>
              <forwarding-action>permit</forwarding-action>
              <source-address>1.1.1.0/24</source-address>
              <destination-address>2.2.2.0/24</destination-address>
              <dscp>af21</dscp>
              <protocol-tcp/>
            </config>
          </ipv4>
        </acl-entry>
      </acl-entries>
    </acl-set>
    <acl-set>
      <name>IN_CUSTOMERIF$20</name>
      <type>ip</type>
      <config>
        <name>IN_CUSTOMERIF$20</name>
        <type>ip</type>
      </config>
      <acl-entries>
        <acl-entry>
          <sequence-id>1</sequence-id>
          <config>
            <sequence-id>1</sequence-id>
          </config>
          <ipv4>
            <config>
```

```
              <forwarding-action>permit</forwarding-action>
              <source-address>3.3.3.0/24</source-address>
              <destination-address>4.4.4.0/24</destination-address>
              <dscp>af31</dscp>
              <protocol-tcp/>
            </config>
          </ipv4>
        </acl-entry>
      </acl-entries>
    </acl-set>
  </acl-sets>
</acl>
<qos xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-qos">
  <global>
    <config>
      <enable-qos>enable</enable-qos>
      <statistics-enabled/>
    </config>
    <class-maps>
      <class-map>
        <name>IN_CUSTOMERIF$10</name>
        <config>
          <name>IN_CUSTOMERIF$10</name>
          <type>qos</type>
          <match-criteria>match-any</match-criteria>
        </config>
        <match-any-conditions>
          <config>
            <access-control-list-name>IN_CUSTOMERIF$10</access-control-list-
name>
          </config>
        </match-any-conditions>
      </class-map>
      <class-map>
        <name>IN_CUSTOMERIF$20</name>
        <config>
          <name>IN_CUSTOMERIF$20</name>
          <type>qos</type>
          <match-criteria>match-any</match-criteria>
        </config>
        <match-any-conditions>
          <config>
            <access-control-list-name>IN_CUSTOMERIF$20</access-control-list-
name>
          </config>
        </match-any-conditions>
      </class-map>
    </class-maps>
    <policy-maps>
      <policy-map>
        <policy-map-name>IN_CUSTOMERIF</policy-map-name>
        <config>
          <policy-map-name>IN_CUSTOMERIF</policy-map-name>
          <type>qos</type>
        </config>
        <classes>
          <class>
```

```
            <class-map-name>IN_CUSTOMERIF$10</class-map-name>
            <config>
              <class-map-name>IN_CUSTOMERIF$10</class-map-name>
              <type>qos</type>
            </config>
            <qos-mode>
              <config>
                <queue-id>0</queue-id>
              </config>
            </qos-mode>
          </class>
          <class>
            <class-map-name>IN_CUSTOMERIF$20</class-map-name>
            <config>
              <class-map-name>IN_CUSTOMERIF$20</class-map-name>
              <type>qos</type>
            </config>
            <qos-mode>
              <config>
                <queue-id>1</queue-id>
              </config>
            </qos-mode>
          </class>
        </classes>
      </policy-map>
      <policy-map>
        <policy-map-name>SCHEDULER_POLICY_2</policy-map-name>
        <config>
          <policy-map-name>SCHEDULER_POLICY_2</policy-map-name>
          <type>queuing-default</type>
        </config>
        <classes>
          <class>
            <class-map-name>q0</class-map-name>
            <config>
              <class-map-name>q0</class-map-name>
              <type>queuing-default</type>
            </config>
            <queue-mode>
              <config>
                <weighted-round-robin-queue-weight>5</weighted-round-robin-
queue-weight>
              </config>
              <tail-drops>
                <tail-drop>
                  <max-threshold>64000</max-threshold>
                  <max-threshold-type>bytes</max-threshold-type>
                  <config>
                    <max-threshold>64000</max-threshold>
                    <max-threshold-type>bytes</max-threshold-type>
                  </config>
                </tail-drop>
              </tail-drops>
              <shapes>
                <shape>
                  <rate-value>256000000</rate-value>
                  <rate-unit>kbps</rate-unit>
```

```
                    <config>
                      <rate-value>256000000</rate-value>
                      <rate-unit>kbps</rate-unit>
                    </config>
                  </shape>
                </shapes>
              </queue-mode>
            </class>
            <class>
              <class-map-name>q1</class-map-name>
              <config>
                <class-map-name>q1</class-map-name>
                <type>queuing-default</type>
              </config>
              <queue-mode>
                <config>
                  <weighted-round-robin-queue-weight>14</weighted-round-robin-
queue-weight>
                </config>
                <tail-drops>
                  <tail-drop>
                    <max-threshold>64000</max-threshold>
                    <max-threshold-type>bytes</max-threshold-type>
                    <config>
                      <max-threshold>64000</max-threshold>
                      <max-threshold-type>bytes</max-threshold-type>
                    </config>
                  </tail-drop>
                </tail-drops>
                <shapes>
                  <shape>
                    <rate-value>256000000</rate-value>
                    <rate-unit>kbps</rate-unit>
                    <config>
                      <rate-value>256000000</rate-value>
                      <rate-unit>kbps</rate-unit>
                    </config>
                  </shape>
                </shapes>
              </queue-mode>
            </class>
          </classes>
        </policy-map>
        <policy-map>
          <policy-map-name>subif-default-out-policy</policy-map-name>
          <config>
            <policy-map-name>subif-default-out-policy</policy-map-name>
            <type>queuing-default</type>
          </config>
          <classes>
            <class>
              <class-map-name>q1</class-map-name>
              <config>
                <class-map-name>q1</class-map-name>
                <type>queuing-default</type>
              </config>
              <queue-mode>
```

```
    <config>
      <priority-level>0</priority-level>
    </config>
  </queue-mode>
</class>
<class>
  <class-map-name>q2</class-map-name>
  <config>
    <class-map-name>q2</class-map-name>
    <type>queuing-default</type>
  </config>
  <queue-mode>
    <config>
      <priority-level>0</priority-level>
    </config>
  </queue-mode>
</class>
<class>
  <class-map-name>q3</class-map-name>
  <config>
    <class-map-name>q3</class-map-name>
    <type>queuing-default</type>
  </config>
  <queue-mode>
    <config>
      <priority-level>0</priority-level>
    </config>
  </queue-mode>
</class>
<class>
  <class-map-name>q4</class-map-name>
  <config>
    <class-map-name>q4</class-map-name>
    <type>queuing-default</type>
  </config>
  <queue-mode>
    <config>
      <priority-level>0</priority-level>
    </config>
  </queue-mode>
</class>
<class>
  <class-map-name>q5</class-map-name>
  <config>
    <class-map-name>q5</class-map-name>
    <type>queuing-default</type>
  </config>
  <queue-mode>
    <config>
      <priority-level>0</priority-level>
    </config>
  </queue-mode>
</class>
<class>
  <class-map-name>q6</class-map-name>
  <config>
    <class-map-name>q6</class-map-name>
```

```
            <type>queuing-default</type>
          </config>
          <queue-mode>
            <config>
              <priority-level>0</priority-level>
            </config>
          </queue-mode>
        </class>
        <class>
          <class-map-name>q7</class-map-name>
          <config>
            <class-map-name>q7</class-map-name>
            <type>queuing-default</type>
          </config>
          <queue-mode>
            <config>
              <priority-level>0</priority-level>
            </config>
          </queue-mode>
        </class>
      </classes>
    </policy-map>
  </policy-maps>
 </global>
</qos>
```

Validation with NetConf get

Here is the NetConf response that gives detailed information about creating Scheduler-policies entries with leaf max-queue-depth-bytes.

```
<qos xmlns="http://openconfig.net/yang/qos">
  <classifiers>
    <classifier>
      <name>IN_CUSTOMERIF</name>
      <config>
        <name>IN_CUSTOMERIF</name>
        <type>IPV4</type>
      </config>
      <state>
        <name>IN_CUSTOMERIF</name>
        <type>IPV4</type>
      </state>
      <terms>
        <term>
          <id>10</id>
          <config>
            <id>10</id>
          </config>
          <state>
            <id>10</id>
          </state>
          <actions>
            <config>
              <target-group>q0</target-group>
            </config>
```

```
            <state>
              <target-group>q0</target-group>
            </state>
          </actions>
          <conditions>
            <ipv4>
              <config>
                <source-address>1.1.1.0/24</source-address>
                <destination-address>2.2.2.0/24</destination-address>
                <dscp>18</dscp>
              </config>
              <state>
                <source-address>1.1.1.0/24</source-address>
                <destination-address>2.2.2.0/24</destination-address>
                <dscp>18</dscp>
              </state>
            </ipv4>
          </conditions>
        </term>
        <term>
          <id>20</id>
          <config>
            <id>20</id>
          </config>
          <state>
            <id>20</id>
          </state>
          <actions>
            <config>
              <target-group>q1</target-group>
            </config>
            <state>
              <target-group>q1</target-group>
            </state>
          </actions>
          <conditions>
            <ipv4>
              <config>
                <source-address>3.3.3.0/24</source-address>
                <destination-address>4.4.4.0/24</destination-address>
                <dscp>26</dscp>
              </config>
              <state>
                <source-address>3.3.3.0/24</source-address>
                <destination-address>4.4.4.0/24</destination-address>
                <dscp>26</dscp>
              </state>
            </ipv4>
          </conditions>
        </term>
      </terms>
    </classifier>
  </classifiers>
  <scheduler-policies>
    <scheduler-policy>
      <name>SCHEDULER_POLICY_2</name>
      <config>
```

```
        <name>SCHEDULER_POLICY_2</name>
      </config>
      <state>
        <name>SCHEDULER_POLICY_2</name>
      </state>
      <schedulers>
        <scheduler>
          <sequence>20</sequence>
          <config>
            <sequence>20</sequence>
            <type
                  xmlns:oc-qos-types="http://openconfig.net/yang/qos-
types">oc-qos-types:ONE_RATE_TWO_COLOR</type>
            <priority>STRICT</priority>
          </config>
          <inputs>
            <input>
              <id>SCHEDULER_POLICY_AF1</id>
              <config>
                <id>SCHEDULER_POLICY_AF1</id>
                <queue>q0</queue>
                <weight>5</weight>
                <input-type>QUEUE</input-type>
              </config>
              <state>
                <weight>5</weight>
                <id>SCHEDULER_POLICY_AF1</id>
                <queue>q0</queue>
                <input-type>QUEUE</input-type>
              </state>
            </input>
            <input>
              <id>SCHEDULER_POLICY_AF2</id>
              <config>
                <id>SCHEDULER_POLICY_AF2</id>
                <queue>q1</queue>
                <weight>14</weight>
                <input-type>QUEUE</input-type>
              </config>
              <state>
                <weight>14</weight>
                <id>SCHEDULER_POLICY_AF2</id>
                <queue>q1</queue>
                <input-type>QUEUE</input-type>
              </state>
            </input>
          </inputs>
          <state>
            <sequence>20</sequence>
            <type
                  xmlns:oc-qos-types="http://openconfig.net/yang/qos-
types">oc-qos-types:ONE_RATE_TWO_COLOR</type>
            <priority>STRICT</priority>
          </state>
          <one-rate-two-color>
            <state>
              <queuing-behavior>SHAPE</queuing-behavior>
```

```
            <max-queue-depth-bytes>64000</max-queue-depth-bytes>
            <cir>256000000</cir>
          </state>
          <config>
            <max-queue-depth-bytes>64000</max-queue-depth-bytes>
            <cir>256000000</cir>
            <queuing-behavior>SHAPE</queuing-behavior>
          </config>
        </one-rate-two-color>
      </scheduler>
    </schedulers>
  </scheduler-policy>
</scheduler-policies>
<queue-management-profiles>
  <queue-management-profile>
    <name>q0</name>
    <config>
      <name>q0</name>
    </config>
    <state>
      <name>q0</name>
    </state>
    <wred>
      <uniform>
        <config>
          <min-threshold>128000</min-threshold>
          <max-threshold>256000</max-threshold>
          <weight>20</weight>
          <max-threshold>90</max-threshold>
        </config>
        <state>
          <min-threshold>128000</min-threshold>
          <max-threshold>256000</max-threshold>
          <weight>20</weight>
          <max-threshold>90</max-threshold>
        </state>
      </uniform>
    </wred>
  </queue-management-profile>
  <queue-management-profile>
    <name>q1</name>
    <config>
      <name>q1</name>
    </config>
    <state>
      <name>q1</name>
    </state>
    <wred>
      <uniform>
        <config>
          <min-threshold>256000</min-threshold>
          <max-threshold>512000</max-threshold>
          <weight>10</weight>
          <max-threshold>70</max-threshold>
        </config>
        <state>
          <min-threshold>256000</min-threshold>
```

```
            <max-threshold>512000</max-threshold>
            <weight>10</weight>
            <max-threshold>70</max-threshold>
          </state>
        </uniform>
      </wred>
    </queue-management-profile>
  </queue-management-profiles>
  <forwarding-groups>
    <forwarding-group>
      <name>q0</name>
      <config>
        <name>q0</name>
        <output-queue>q0</output-queue>
        <fabric-priority>128</fabric-priority>
      </config>
      <state>
        <name>q0</name>
        <output-queue>q0</output-queue>
        <fabric-priority>128</fabric-priority>
      </state>
    </forwarding-group>
  </forwarding-groups>
  <queues>
    <queue>
      <name>q0</name>
      <config>
        <name>q0</name>
        <queue-id>0</queue-id>
      </config>
      <state>
        <name>q0</name>
        <queue-id>0</queue-id>
      </state>
    </queue>
    <queue>
      <name>q1</name>
      <config>
        <name>q1</name>
        <queue-id>1</queue-id>
      </config>
      <state>
        <name>q1</name>
        <queue-id>1</queue-id>
      </state>
    </queue>
  </queues>
</qos>
```

Restrictions

- The path `/qos/queue-management-profiles` is available on Open Config versions above 1.0.0.
- The path `/qos/queues` has been restructured on Open Config versions above 1.0.0.
- The only valid value for path /`qos/scheduler-policies/scheduler-policy/schedulers/scheduler/config/priority` is **STRICT**.

- The leaf name for path `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/inputs/input/config/queue` must have fixed names that follow the pattern **q[0-7]**.
- The scheduler-policies input configuration for OpenConfig XPath `/oc-qos:qos/scheduler-policies/scheduler-policy/schedulers/scheduler/inputs/input/config` now has its leaf `queue` as mandatory in operations "**create**", "**delete**", "**remove**" and "**merge**". This is because the translation mapping done on OcNOS datamodel to XPath `/qos/global/policy-maps/policy-map/classes/class` and the queue leaf points to `class-map-name` leaf on OcNOS. If this condition is not addressed, the Translation Framework throws an error when the OpenConfig payload is applied.
- All the paths shown below have restrictions:
  - `/qos/interfaces/interface/input/scheduler-policy`

    This association is not valid on OcNOS and is not supported.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/output`

    This association is not valid on OcNOS and is not supported.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/bc`

    This association is not valid on OcNOS and is not supported.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/cir-pct`

    This association is not valid on OcNOS and is not supported.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler`

    This list has a fixed max-element as one entry.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/config/type`

    This configuration has a fixed value as **ONE_RATE_TWO_COLOR**.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/inputs/input/config/input-type`

    This configurations has a fixed value as **QUEUE**.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/cir-pct-remaining`

    This association is not valid on OcNOS and is not supported.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/queuing-behavior`

    This configuration has a fixed value as **SHAPE**.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-packets`

    This association is not valid on OcNOS and is not supported.
  - /`qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/config/max-queue-depth-percent`

    This association is not valid on OcNOS and is not supported.
  - `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/conform-action`

    This association is not valid on OcNOS and is not supported.

- `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/one-rate-two-color/exceed-action`

  This association is not valid on OcNOS and is not supported.

- `/qos/scheduler-policies/scheduler-policy/schedulers/scheduler/two-rate-three-color`

  This association is not valid on OcNOS and is not supported.

Create Interfaces Classifier Association

Release

This configuration was introduced in OcNOS version 6.5.0.

Configuration

On OpenConfig model, the classifier profile can be associated to an interface on egress and ingress direction, and a list of classifiers can be associated to an interface. But on OcNOS model, the interface only allows one classifier object, and the association is in ingress direction.

On OcNOS model, the association between QoS ingress interface and QoS classifier profile needs the hardware-profile `ingress-ipv4-qos` to be enabled before the association. The translation adds the hardware-profile `ingress-ipv4-qos` configuration during translation on XPath `/oc-qos:qos/interfaces/interface/input/classifiers/classifier/config/name`.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create an interfaces classifier association.

```
<qos xmlns="http://openconfig.net/yang/qos">
   <queues>
        <queue>
            <name>q0</name>
            <config>
                <name>q0</name>
                <queue-id>0</queue-id>
            </config>
        </queue>
    </queues>
    <queue-management-profiles>
        <queue-management-profile>
            <name>q0</name>
            <config>
                <name>q0</name>
            </config>
            <wred>
                <uniform>
                    <config>
                        <min-threshold>128000</min-threshold>
                        <max-threshold>256000</max-threshold>
                        <weight>20</weight>
```

```
                        <max-drop-probability-percent>90</max-drop-
probability-percent>
                    </config>
                </uniform>
            </wred>
        </queue-management-profile>
    </queue-management-profiles>
    <forwarding-groups>
        <forwarding-group>
            <name>q0</name>
            <config>
                <name>q0</name>
                <output-queue>q0</output-queue
            </config>
        </forwarding-group>
    </forwarding-groups>
    <classifiers>
        <classifier>
            <name>IN_CUSTOMERIF</name>
            <config>
                <name>IN_CUSTOMERIF</name>
                <type>IPV4</type>
            </config>
            <terms>
                <term>
                    <id>10</id>
                    <config>
                        <id>10</id>
                    </config>
                    <conditions>
                        <ipv4>
                            <config>
                                <source-address>1.1.1.1/24</source-address>
                                <destination-address>2.2.2.2/24</destination-
address>
                                <dscp>af21</dscp>
                            </config>
                        </ipv4>
                    </conditions>
                    <actions>
                        <config>
                            <target-group>q0</target-group>
                        </config>
                    </actions>
                </term>
            </terms>
        </classifier>
    </classifiers>
    <interfaces>
        <interface>
            <interface-id>eth2</interface-id>
            <config>
                <interface-id>eth2</interface-id>
            </config>
            <interface-ref>
                <config>
                    <interface>eth2</interface>
```

```
                </config>
            </interface-ref>
            <input>
                <classifiers>
                    <classifier>
                        <type>IPV4</type>
                         <config>
                            <name>IN_CUSTOMERIF</name>
                            <type>IPV4</type>
                         </config>
                    </classifier>
                </classifiers>
            </input>
        </interface>
    </interfaces>
</qos>
```

OcNOS CLI command

```
hardware-profile filter ingress-ipv4-qos enable
qos enable
!
ip access-list IN_CUSTOMERIF$10
 1 permit tcp 1.1.1.0/24 2.2.2.0/24 dscp af21
!
class-map type qos match-any IN_CUSTOMERIF$10
 match access-group IN_CUSTOMERIF$10
!
policy-map type qos IN_CUSTOMERIF
 class type qos IN_CUSTOMERIF$10
  set queue 0
  exit
 class type qos IN_CUSTOMERIF$20
  set queue 1
  exit
!
interface eth2
 service-policy type qos input IN_CUSTOMERIF
!
```

OcNOS NetConf Payload

```
            <profiles xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-
platform">
      <hardware-profile>
        <filters>
          <config>
            <ingress-ipv4-qos/>
          </config>
        </filters>
      </hardware-profile>
    </profiles>
    <acl xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-acl">
      <acl-sets>
        <acl-set>
          <name>IN_CUSTOMERIF$10</name>
```

```
            <type>ip</type>
            <config>
              <name>IN_CUSTOMERIF$10</name>
              <type>ip</type>
            </config>
            <acl-entries>
              <acl-entry>
                <sequence-id>1</sequence-id>
                <config>
                  <sequence-id>1</sequence-id>
                </config>
                <ipv4>
                  <config>
                    <forwarding-action>permit</forwarding-action>
                    <source-address>1.1.1.0/24</source-address>
                    <destination-address>2.2.2.0/24</destination-address>
                    <dscp>af21</dscp>
                    <protocol-tcp/>
                  </config>
                </ipv4>
              </acl-entry>
            </acl-entries>
          </acl-set>
        </acl-sets>
      </acl>
      <qos xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-qos">
        <global>
          <config>
            <enable-qos>enable</enable-qos>
          </config>
          <class-maps>
            <class-map>
              <name>IN_CUSTOMERIF$10</name>
              <config>
                <name>IN_CUSTOMERIF$10</name>
                <type>qos</type>
                <match-criteria>match-any</match-criteria>
              </config>
              <match-any-conditions>
                <config>
                  <access-control-list-name>IN_CUSTOMERIF$10</access-control-
list-name>
                </config>
              </match-any-conditions>
            </class-map>
          </class-maps>
          <policy-maps>
            <policy-map>
              <policy-map-name>IN_CUSTOMERIF</policy-map-name>
              <config>
                <policy-map-name>IN_CUSTOMERIF</policy-map-name>
                <type>qos</type>
              </config>
              <classes>
                <class>
                  <class-map-name>IN_CUSTOMERIF$10</class-map-name>
                  <config>
```

```
                    <class-map-name>IN_CUSTOMERIF$10</class-map-name>
                    <type>qos</type>
                  </config>
                  <qos-mode>
                    <config>
                      <queue-id>0</queue-id>
                    </config>
                  </qos-mode>
                </class>
              </classes>
            </policy-map>
          </policy-maps>
        </global>
        <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-qos-if">
          <interface>
            <name>eth2</name>
            <config>
              <name>eth2</name>
            </config>
            <service-policy>
              <ingress>
                <config>
                  <type-qos-policy-map-name>IN_CUSTOMERIF</type-qos-policy-map-
name>
                </config>
              </ingress>
            </service-policy>
          </interface>
        </interfaces>
```

Validation with NetConf get

```
<qos xmlns="http://openconfig.net/yang/qos">
  <classifiers>
    <classifier>
      <name>IN_CUSTOMERIF</name>
      <config>
        <name>IN_CUSTOMERIF</name>
        <type>IPV4</type>
      </config>
      <state>
        <name>IN_CUSTOMERIF</name>
        <type>IPV4</type>
      </state>
      <terms>
        <term>
          <id>10</id>
          <config>
            <id>10</id>
          </config>
          <state>
            <id>10</id>
          </state>
          <actions>
            <config>
              <target-group>q0</target-group>
            </config>
```

```
            <state>
              <target-group>q0</target-group>
            </state>
          </actions>
          <conditions>
            <ipv4>
              <config>
                <source-address>1.1.1.0/24</source-address>
                <destination-address>2.2.2.0/24</destination-address>
                <dscp>18</dscp>
              </config>
              <state>
                <source-address>1.1.1.0/24</source-address>
                <destination-address>2.2.2.0/24</destination-address>
                <dscp>18</dscp>
              </state>
            </ipv4>
          </conditions>
        </term>
        <term>
          <id>20</id>
          <config>
            <id>20</id>
          </config>
          <state>
            <id>20</id>
          </state>
          <actions>
            <config>
              <target-group>q1</target-group>
            </config>
            <state>
              <target-group>q1</target-group>
            </state>
          </actions>
          <conditions>
            <ipv4>
              <config>
                <source-address>3.3.3.0/24</source-address>
                <destination-address>4.4.4.0/24</destination-address>
                <dscp>26</dscp>
              </config>
              <state>
                <source-address>3.3.3.0/24</source-address>
                <destination-address>4.4.4.0/24</destination-address>
                <dscp>26</dscp>
              </state>
            </ipv4>
          </conditions>
        </term>
      </terms>
    </classifier>
  </classifiers>
  <interfaces>
    <interface>
      <interface-id>eth2</interface-id>
      <config>
```

```
        <interface-id>eth2</interface-id>
      </config>
      <input>
        <classifiers>
          <classifier>
            <config>
              <name>IN_CUSTOMERIF</name>
              <type>IPV4</type>
            </config>
            <type>IPV4</type>
            <state>
              <name>IN_CUSTOMERIF</name>
              <type>IPV4</type>
            </state>
            <terms>
              <term>
                <id>10</id>
                <state>
                  <id>10</id>
                  <matched-packets>0</matched-packets>
                  <matched-octets>0</matched-octets>
                </state>
              </term>
              <term>
                <id>20</id>
                <state>
                  <id>20</id>
                  <matched-packets>0</matched-packets>
                  <matched-octets>0</matched-octets>
                </state>
              </term>
            </terms>
          </classifier>
        </classifiers>
      </input>
      <interface-ref>
        <config>
          <interface>eth2</interface>
        </config>
        <state>
          <interface>eth2</interface>
        </state>
      </interface-ref>
      <state>
        <interface-id>eth2</interface-id>
      </state>
    </interface>
  </interfaces>
  <queue-management-profiles>
    <queue-management-profile>
      <name>q0</name>
      <config>
        <name>q0</name>
      </config>
      <state>
        <name>q0</name>
      </state>
```

```
      <wred>
        <uniform>
          <config>
            <min-threshold>128000</min-threshold>
            <max-threshold>256000</max-threshold>
            <weight>20</weight>
            <max-threshold>90</max-threshold>
          </config>
          <state>
            <min-threshold>128000</min-threshold>
            <max-threshold>256000</max-threshold>
            <weight>20</weight>
            <max-threshold>90</max-threshold>
          </state>
        </uniform>
      </wred>
    </queue-management-profile>
    <queue-management-profile>
      <name>q1</name>
      <config>
        <name>q1</name>
      </config>
      <state>
        <name>q1</name>
      </state>
      <wred>
        <uniform>
          <config>
            <min-threshold>256000</min-threshold>
            <max-threshold>512000</max-threshold>
            <weight>10</weight>
            <max-threshold>70</max-threshold>
          </config>
          <state>
            <min-threshold>256000</min-threshold>
            <max-threshold>512000</max-threshold>
            <weight>10</weight>
            <max-threshold>70</max-threshold>
          </state>
        </uniform>
      </wred>
    </queue-management-profile>
  </queue-management-profiles>
  <forwarding-groups>
    <forwarding-group>
      <name>q0</name>
      <config>
        <name>q0</name>
        <output-queue>q0</output-queue>
        <fabric-priority>128</fabric-priority>
      </config>
      <state>
        <name>q0</name>
        <output-queue>q0</output-queue>
        <fabric-priority>128</fabric-priority>
      </state>
    </forwarding-group>
```

```
    </forwarding-groups>
    <queues>
      <queue>
        <name>q0</name>
        <config>
          <name>q0</name>
          <queue-id>0</queue-id>
        </config>
        <state>
          <name>q0</name>
          <queue-id>0</queue-id>
        </state>
      </queue>
      <queue>
        <name>q1</name>
        <config>
          <name>q1</name>
          <queue-id>1</queue-id>
        </config>
        <state>
          <name>q1</name>
          <queue-id>1</queue-id>
        </state>
      </queue>
    </queues>
  </qos>
```

Restrictions

- The translation of XPath `/oc-qos:qos/interfaces/interface/input/classifiers/classifier/config/name` adds the OcNOS hardware-profile `ingress-ipv4-qos` configuration.
- Path `/qos/queue-management-profiles` is available on OpenConfig versions above 1.0.0.
- Path `/qos/queues` has been restructured on Open Config versions above 1.0.0.
- All the paths shown below have restrictions:
  - `/qos/interfaces/interface/input/classifiers`

    Only one entry can be inserted on this list.
  - /`qos/interfaces/interface/output/classifiers`

    This association is not supported on OcNOS model.
  - /qos/interfaces/interface/interface-id

    This leaf must have the format "<**interface**>.<**subinterface**>", e.g., xe10.2, and it is limited to 32 characters.

Create Interfaces Scheduler-policies Association

Release

This configuration was introduced in OcNOS version 6.5.0.

Configuration

On OpenConfig model, the Scheduler-policies profile can be associated to an interface on egress and ingress direction.
But on OcNOS model, the interface only allows one scheduler-policies object, and the association is in ingress direction.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create interfaces scheduler-policies association.

```
<qos xmlns="http://openconfig.net/yang/qos">
    <queues>
        <queue>
            <name>q0</name>
            <config>
                <name>q0</name>
                <queue-id>0</queue-id>
            </config>
        </queue>
    </queues>
    <queue-management-profiles>
        <queue-management-profile>
            <name>q0</name>
            <config>
                <name>q0</name>
            </config>
            <wred>
                <uniform>
                    <config>
                        <min-threshold>128000</min-threshold>
                        <max-threshold>256000</max-threshold>
                        <weight>20</weight>
                        <max-drop-probability-percent>90</max-drop-
probability-percent>
                    </config>
                </uniform>
            </wred>
        </queue-management-profile>
    </queue-management-profiles>
    <forwarding-groups>
        <forwarding-group>
            <name>q0</name>
            <config>
                <name>q0</name>
                <output-queue>q0</output-queue>
            </config>
        </forwarding-group>
    </forwarding-groups>
    <scheduler-policies>
        <scheduler-policy>
            <name>SCHEDULER_POLICY_1</name>
            <config>
                <name>SCHEDULER_POLICY_1</name>
            </config>
            <schedulers>
```

```
                <scheduler>
                    <sequence>10</sequence>
                    <config>
                        <sequence>10</sequence>
                        <type>ONE_RATE_TWO_COLOR</type>
                        <priority>STRICT</priority>
                    </config>
                    <inputs>
                        <input>
                            <id>SCHEDULER_POLICY_AF1</id>
                            <config>
                                <id>SCHEDULER_POLICY_AF1</id>
                                <input-type>QUEUE</input-type>
                                <queue>q0</queue>
                                <weight>5</weight>
                            </config>
                        </input>
                    </inputs>
                </scheduler>
            </schedulers>
        </scheduler-policy>
    </scheduler-policies>
    <interfaces>
        <interface>
            <interface-id>eth2</interface-id>
            <config>
                <interface-id>eth2</interface-id>
            </config>
            <interface-ref>
                <config>
                    <interface>eth2</interface>
                </config>
            </interface-ref>
            <output>
                <scheduler-policy>
                    <config>
                        <name>SCHEDULER_POLICY_1</name>
                    </config>
                </scheduler-policy>
            </output>
        </interface>
    </interfaces>
</qos>
```

OcNOS CLI command

The below CLI command is used to create interfaces scheduler-policies association.

```
qos enable
!
policy-map type queuing default SCHEDULER_POLICY_1
 class type queuing default q0
  wrr-queue weight 5
  random-detect min-threshold 128000 max-threshold 256000 bytes drop-
probability 80
  exit
!
```

```
interface eth2
 service-policy type queuing output SCHEDULER_POLICY_1
!
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create interfaces scheduler-policies association.

```
              <qos xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-qos">
        <global>
          <config>
            <enable-qos>enable</enable-qos>
          </config>
          <policy-maps>
            <policy-map>
              <policy-map-name>SCHEDULER_POLICY_1</policy-map-name>
              <config>
                <policy-map-name>SCHEDULER_POLICY_1</policy-map-name>
                <type>queuing-default</type>
              </config>
              <classes>
                <class>
                  <class-map-name>q0</class-map-name>
                  <config>
                    <class-map-name>q0</class-map-name>
                    <type>queuing-default</type>
                  </config>
                  <queue-mode>
                    <config>
                      <weighted-round-robin-queue-weight>5</weighted-round-
robin-queue-weight>
                    </config>
                    <red>
                      <wred>
                        <config>
                          <min-threshold>128000</min-threshold>
                          <threshold-unit>bytes</threshold-unit>
                          <max-threshold>256000</max-threshold>
                          <drop-probability>80</drop-probability>
                        </config>
                      </wred>
                    </red>
                  </queue-mode>
                </class>
              </classes>
            </policy-map>
          </policy-maps>
        </global>
        <interfaces xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-qos-if">
          <interface>
            <name>eth2</name>
            <config>
              <name>eth2</name>
            </config>
            <service-policy>
              <egress>
                <config>
```

```
                <type-queuing-policy-map-name>SCHEDULER_POLICY_1</type-
queuing-policy-map-name>
              </config>
            </egress>
          </service-policy>
        </interface>
      </interfaces>
    </qos>
```

Validation with NetConf get

Here is a NetConf validation response that provides detailed information about creating interfaces scheduler-policies association.

```
<qos xmlns="http://openconfig.net/yang/qos">
  <scheduler-policies>
    <scheduler-policy>
      <name>SCHEDULER_POLICY_1</name>
      <config>
        <name>SCHEDULER_POLICY_1</name>
      </config>
      <state>
        <name>SCHEDULER_POLICY_1</name>
      </state>
      <schedulers>
        <scheduler>
          <sequence>10</sequence>
          <config>
            <sequence>10</sequence>
            <type
              xmlns:oc-qos-types="http://openconfig.net/yang/qos-types">oc-
qos-types:ONE_RATE_TWO_COLOR</type>
            <priority>STRICT</priority>
          </config>
          <inputs>
            <input>
              <id>SCHEDULER_POLICY_AF1</id>
              <config>
                <id>SCHEDULER_POLICY_AF1</id>
                <queue>q0</queue>
                <weight>5</weight>
                <input-type>QUEUE</input-type>
              </config>
              <state>
                <weight>5</weight>
                <id>SCHEDULER_POLICY_AF1</id>
                <queue>q0</queue>
                <input-type>QUEUE</input-type>
              </state>
            </input>
          </inputs>
          <state>
            <sequence>10</sequence>
            <type
              xmlns:oc-qos-types="http://openconfig.net/yang/qos-types">oc-
qos-types:ONE_RATE_TWO_COLOR</type>
            <priority>STRICT</priority>
```

```
          </state>
        </scheduler>
      </schedulers>
    </scheduler-policy>
  </scheduler-policies>
  <interfaces>
    <interface>
      <interface-id>eth2</interface-id>
      <config>
        <interface-id>eth2</interface-id>
      </config>
      <output>
        <scheduler-policy>
          <config>
            <name>SCHEDULER_POLICY_1</name>
          </config>
          <state>
            <name>SCHEDULER_POLICY_1</name>
          </state>
          <schedulers>
            <scheduler>
              <sequence>10</sequence>
              <state>
                <sequence>10</sequence>
                <conforming-octets>0</conforming-octets>
                <conforming-pkts>0</conforming-pkts>
                <exceeding-octets>0</exceeding-octets>
                <exceeding-pkts>0</exceeding-pkts>
              </state>
            </scheduler>
          </schedulers>
        </scheduler-policy>
      </output>
      <interface-ref>
        <config>
          <interface>eth2</interface>
        </config>
        <state>
          <interface>eth2</interface>
        </state>
      </interface-ref>
      <state>
        <interface-id>eth2</interface-id>
      </state>
    </interface>
  </interfaces>
  <queue-management-profiles>
    <queue-management-profile>
      <name>q0</name>
      <config>
        <name>q0</name>
      </config>
      <state>
        <name>q0</name>
      </state>
      <wred>
        <uniform>
```

```
          <config>
            <min-threshold>128000</min-threshold>
            <max-threshold>256000</max-threshold>
            <weight>20</weight>
            <max-threshold>90</max-threshold>
          </config>
          <state>
            <min-threshold>128000</min-threshold>
            <max-threshold>256000</max-threshold>
            <weight>20</weight>
            <max-threshold>90</max-threshold>
          </state>
        </uniform>
      </wred>
    </queue-management-profile>
    <queue-management-profile>
      <name>q1</name>
      <config>
        <name>q1</name>
      </config>
      <state>
        <name>q1</name>
      </state>
      <wred>
        <uniform>
          <config>
            <min-threshold>256000</min-threshold>
            <max-threshold>512000</max-threshold>
            <weight>10</weight>
            <max-threshold>70</max-threshold>
          </config>
          <state>
            <min-threshold>256000</min-threshold>
            <max-threshold>512000</max-threshold>
            <weight>10</weight>
            <max-threshold>70</max-threshold>
          </state>
        </uniform>
      </wred>
    </queue-management-profile>
  </queue-management-profiles>
  <forwarding-groups>
    <forwarding-group>
      <name>q0</name>
      <config>
        <name>q0</name>
        <output-queue>q0</output-queue>
        <fabric-priority>128</fabric-priority>
      </config>
      <state>
        <name>q0</name>
        <output-queue>q0</output-queue>
        <fabric-priority>128</fabric-priority>
      </state>
    </forwarding-group>
  </forwarding-groups>
  <queues>
```

```
      <queue>
        <name>q0</name>
        <config>
          <name>q0</name>
          <queue-id>0</queue-id>
        </config>
        <state>
          <name>q0</name>
          <queue-id>0</queue-id>
        </state>
      </queue>
      <queue>
        <name>q1</name>
        <config>
          <name>q1</name>
          <queue-id>1</queue-id>
        </config>
        <state>
          <name>q1</name>
          <queue-id>1</queue-id>
        </state>
      </queue>
    </queues>
  </qos>
```

Restrictions

- The path `/qos/queue-management-profiles` is available on Open Config versions above 1.0.0.
- The path `/qos/queues` has been restructured on OpenConfig versions above 1.0.0.
- The path `/qos/interfaces/interface/interface-id` has the following restriction:
  - It must be in the format **<interface>.<subinterface>** For example: xe10.2, and limited to 32 characters.

OpenZR+ OpenConfig Translation

General Restrictions

Operation create

NETCONF's `operation="create"` only supports *objectlist* elements, for example: `components/component[name]` or `/terminal-device/logical-channels/channel[index]`.
Payloads with this operation on other elements have undefined behavior.

Operation merge and create

- It is not possible to create or merge a single instance of an OpenConfig component for OpenZR+ (module or optical channel) without some other valid configuration as OcNOS does not accept it.
- The creation or merging of the OpenConfig logical-channel instance for OpenZR+ must also be accompanied by the configuration of loopback-mode.

Laser frequency configuration in OpenZR+ media channel

- It is not possible to separately configure the grid, channel and fine-tune-frequency for laser configuration in a media channel for OpenZR+ in OpenConfig. The configuration of only the total frequency value is possible.
- In this way the central frequency is fixed at 193.1 THz and the grid is fixed at 100 GHz. With these values it is possible to calculate the channel and fine-tune-frequency for OcNOS.

Disable/enable OpenZR+ transceiver

This XML configuration snippet is used to disable/enable OpenZR+ transceiver.

Release

This configuration was introduced in OcNOS version 6.5.1.

Disable configuration

Here are the configuration details to disable OpenZR+ transceiver.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to disable OpenZR+ transceiver.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
```

```
        <name>CMIS-MODULE-50</name><config>
          <name>CMIS-MODULE-50</name>
        </config>
        <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
          <config>
            <enabled>false</enabled>
          </config>
        </transceiver>
      </component>
    </components>
  </config>
```

OcNOS CLI Command

The below CLI command is used to disable OpenZR+ transceiver.

```
 qsfp-dd 50
 service-disable
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to disable OpenZR+ transceiver.

```
<qsfp-dds xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
  <qsfp-dd>
    <fp-port>50</fp-port>
    <config>
      <fp-port>50</fp-port>
      <service-disable />
    </config>
  </qsfp-dd>
</qsfp-dds>
```

Enable configuration

Here are the configuration steps to enable OpenZR+ transceiver.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to enable OpenZR+ transceiver.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>CMIS-MODULE-50</name><config>
        <name>CMIS-MODULE-50</name>
      </config>
      <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
        <config>
          <enabled>true</enabled>
        </config>
      </transceiver>
    </component>
  </components>
</config>
```

OcNOS CLI Command

The below CLI command is used to enable OpenZR+ transceiver.

```
qsfp-dd 50
no service-disable
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to enable OpenZR+ transceiver.

```
<qsfp-dds xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
  <qsfp-dd>
    <fp-port>50</fp-port>
    <config>
      <fp-port>50</fp-port>
      <service-disable operation="delete" />
    </config>
  </qsfp-dd>
</qsfp-dds>
```

Configure OpenZR+ optical channel operational mode

This XML configuration snippet is used to configure OpenZR+ optical channel operational mode.

Release

This configuration was introduced in OcNOS version 6.5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure OpenZR+ optical channel operational mode.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>OCH-0/50</name>
      <config>
        <name>OCH-0/50</name>
      </config>
      <optical-channel>
        <config>
          <operational-mode>10</operational-mode>
        </config>
      </optical-channel>
    </component>
  </components>
</config>
```

OcNOS CLI Command

The below CLI is used to configure OpenZR+ optical channel operational mode.

```
qsfp-dd 50
 application 10
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure OpenZR+ optical channel operational mode.

```
<qsfp-dds xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
  <qsfp-dd>
    <fp-port>50</fp-port>
    <config>
      <fp-port>50</fp-port>
      <application>10</application>
    </config>
  </qsfp-dd>
</qsfp-dds>
```

Unconfiguration

Here are the commands to unconfigure OpenZR+ channel operational mode.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to unconfigure OpenZR+ optical channel operational mode.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>OCH-0/50</name>
      <optical-channel>
        <config>
          <operational-mode operation="delete" />
        </config>
      </optical-channel>
    </component>
  </components>
</config>
```

OcNOS CLI Command

The below CLI is used to unconfigure OpenZR+ optical channel operational mode.

```
qsfp-dd 50
 no application
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to unconfigure OpenZR+ optical channel operational mode.

```
<qsfp-dds xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
  <qsfp-dd>
    <fp-port>50</fp-port>
    <config>
      <application operation="delete" />
    </config>
```

```
  </qsfp-dd>
</qsfp-dds>
```

Configure OpenZR+ optical channel target output power

This XML configuration snippet is used to configure OpenZR+ optical channel target output power.

Release

This configuration was introduced in OcNOS version 6.5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure OpenZR+ optical channel target output power.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>OCH-0/50</name>
      <config>
        <name>OCH-0/50</name>
      </config>
      <optical-channel>
        <config>
          <target-output-power>1.00</target-output-power>
        </config>
      </optical-channel>
    </component>
  </components>
</config>
```

OcNOS CLI Command

The below CLI command is used to configure OpenZR+ optical channel target output power.

```
qsfp-dd 50
 media-lane 1
  laser output-power 1.00
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure OpenZR+ optical channel target output power.

```
<qsfp-dds xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
  <qsfp-dd>
    <fp-port>50</fp-port>
    <config>
      <fp-port>50</fp-port>
    </config>
    <media>
      <lanes>
        <lane>
          <lane-number>1</lane-number>
```

```
            <laser>
              <config>
                <output-power>1.00</output-power>
              </config>
            </laser>
          </lane>
        </lanes>
      </media>
    </qsfp-dd>
  </qsfp-dds>
```

Unconfiguration

Here are the commands to unconfigure OpenZR+ channel target output power.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to unconfigure OpenZR+ optical channel target output power.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>OCH-0/50</name>
      <optical-channel>
        <config>
          <target-output-power operation="delete" />
        </config>
      </optical-channel>
    </component>
  </components>
</config>
```

OcNOS CLI Command

The below CLI command is used to unconfigure OpenZR+ optical channel target output power.

```
qsfp-dd 50
 media-lane 1
  no laser output-power
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to unconfigure OpenZR+ optical channel target output power.

```
<qsfp-dds xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
  <qsfp-dd>
    <fp-port>50</fp-port>
    <media>
      <lanes>
        <lane>
          <lane-number>1</lane-number>
          <laser>
            <config>
              <output-power operation="delete" />
            </config>
```

```
          </laser>
        </lane>
      </lanes>
    </media>
  </qsfp-dd>
</qsfp-dds>
```

Configure OpenZR+ optical channel frequency

This XML configuration snippet is used to configure OpenZR+ optical channel frequency.

Release

This configuration was introduced in OcNOS version 6.5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure OpenZR+ optical channel frequency.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>OCH-0/50</name>
      <config>
        <name>OCH-0/50</name>
      </config>
      <optical-channel>
        <config>
          <frequency>191300005</frequency>
        </config>
      </optical-channel>
    </component>
  </components>
</config>
```

OcNOS CLI Command

The below CLI command is used to configure OpenZR+ optical channel frequency.

```
qsfp-dd 50
 media-lane 1
  laser grid 100
  laser channel -18
  laser fine-tune-freq 0.005
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure OpenZR+ optical channel frequency.

```
<qsfp-dds xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
  <qsfp-dd>
    <fp-port>50</fp-port>
    <config>
```

```
        <fp-port>50</fp-port>
      </config>
      <media>
        <lanes>
          <lane>
            <lane-number>1</lane-number>
            <laser>
              <config>
                <channel>-18</channel>
                <grid>100</grid>
                <fine-tune-freq>0.005</fine-tune-freq>
              </config>
            </laser>
          </lane>
        </lanes>
      </media>
    </qsfp-dd>
  </qsfp-dds>
```

Unconfiguration

Here are the commands to unconfigure OpenZR+ optical channel frequency.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to unconfigure OpenZR+ optical channel frequency.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>OCH-0/50</name>
      <optical-channel>
        <config>
          <frequency operation="delete" />
        </config>
      </optical-channel>
    </component>
  </components>
</config>
```

OcNOS CLI Command

The below CLI command is used to unconfigure OpenZR+ optical channel frequency.

```
qsfp-dd 50
 media-lane 1
  no laser grid
  no laser channel
  no laser fine-tune-freq
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to unconfigure OpenZR+ optical channel frequency.

```
<qsfp-dds xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
```

```
  <qsfp-dd>
    <fp-port>50</fp-port>
    <media>
      <lanes>
        <lane>
          <lane-number>1</lane-number>
          <laser>
            <config>
              <channel operation="delete" />
              <grid operation="delete" />
              <fine-tune-freq operation="delete" />
            </config>
          </laser>
        </lane>
      </lanes>
    </media>
  </qsfp-dd>
</qsfp-dds>
```

Configure OpenZR+ loopback mode

This XML configuration snippet is used to configure OpenZR+ loopback mode.

Release

This configuration was introduced in OcNOS version 6.5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure OpenZR+ loopback mode.

```
<config>
  <terminal-device xmlns="http://openconfig.net/yang/terminal-device">
    <logical-channels>
      <channel>
        <index>838861056</index>
        <config>
          <index>838861056</index>
          <loopback-mode>TERMINAL</loopback-mode>
        </config>
      </channel>
    </logical-channels>
  </terminal-device>
</config>
```

OcNOS CLI Command

The below CLI command is used to configure OpenZR+ loopback mode.

```
qsfp-dd 50
 loopback in media
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure OpenZR+ loopback mode.

```
<qsfp-dds xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
  <qsfp-dd>
    <fp-port>50</fp-port>
    <config>
      <fp-port>50</fp-port>
    </config>
    <media>
      <loopback>
        <config>
          <type>in</type>
        </config>
      </loopback>
    </media>
  </qsfp-dd>
</qsfp-dds>
```

Unconfiguration

Here are the commands to unconfigure OpenZR+ loopback mode.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to unconfigure OpenZR+ loopback mode.

```
<config>
  <terminal-device xmlns="http://openconfig.net/yang/terminal-device">
    <logical-channels>
      <channel>
        <index>838861056</index>
        <config>
          <loopback-mode operation="delete" />
        </config>
      </channel>
    </logical-channels>
  </terminal-device>
</config>
```

OcNOS CLI Command

The below CLI command is used to unconfigure OpenZR+ loopback mode.

```
qsfp-dd 50
 no loopback media
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to unconfigure OpenZR+ loopback mode.

```
<qsfp-dds xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-platform">
  <qsfp-dd>
    <fp-port>50</fp-port>
```

```
    <media>
      <loopback>
        <config>
          <type operation="delete" />
        </config>
      </loopback>
    </media>
  </qsfp-dd>
</qsfp-dds>
```

Validate OpenZR+ module state

Use these commands to validate OpenZR+ module state.

Release

This configuration was introduced in OcNOS version 6.5.1.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>CMIS-MODULE-50</name>
      <state />
    </component>
  </components>
</config>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for validating OpenZR+ module state.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>CMIS-MODULE-50</name>
    <state>
      <id>CMIS-MODULE-50</id>
      <name>CMIS-MODULE-50</name>
      <type>oc-platform-types:TRANSCEIVER</type>
      <location>50</location>
      <mfg-name>SmartOptics</mfg-name>
      <mfg-date>2022-03-18</mfg-date>
      <description>CMIS Transceiver</description>
      <hardware-version>49.48</hardware-version>
      <firmware-version>61.20</firmware-version>
      <software-version>NA</software-version>
      <serial-no>214156344</serial-no>
      <part-no>SO-TQSFPDD4CCZRP</part-no>
      <removable>true</removable>
      <oper-status
```

```
        xmlns:oc-platform-types="http://openconfig.net/yang/platform-
types">oc-platform-types:INACTIVE</oper-status>
      <parent>PORT-QSFP-50</parent>
      <empty>false</empty>
      <allocated-power>0</allocated-power>
      <temperature>
        <instant>0.0</instant>
      </temperature>
    </state>
  </component>
</components>
```

Validate OpenZR+ transceiver state

Use these commands to validate OpenZR+ transceiver state.

Release

This configuration was introduced in OcNOS version 6.5.1.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>CMIS-MODULE-50</name>
      <transceiver>
        <state />
      </transceiver>
    </component>
  </components>
</config>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for validating OpenZR+ transceiver state.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>CMIS-MODULE-50</name>
    <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
      <state>
        <form-factor
          xmlns:oc-opt-types="http://openconfig.net/yang/transport-types">oc-
opt-types:QSFP56_DD_TYPE1</form-factor>
        <connector-type
          xmlns:oc-opt-types="http://openconfig.net/yang/transport-types">oc-
opt-types:LC_CONNECTOR</connector-type>
        <vendor>SmartOptics</vendor>
        <vendor-part>SO-TQSFPDD4CCZRP</vendor-part>
        <vendor-rev>A</vendor-rev>
```

```
          <serial-no>214156344</serial-no>
          <date-code>220318</date-code>
          <supply-voltage>
            <instant>3.32</instant>
          </supply-voltage>
        </state>
      </transceiver>
    </component>
  </components>
```

Validate OpenZR+ transceiver thresholds

Use these commands to validate OpenZR+ transceiver thresholds.

Release

This configuration was introduced in OcNOS version 6.5.1.

Severity CRITICAL

The below commands are used to validate the thresholds with critical severity.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>CMIS-MODULE-50</name>
      <transceiver>
        <thresholds>
          <threshold>
            <severity>CRITICAL</severity>
          </threshold>
        </thresholds>
      </transceiver>
    </component>
  </components>
</config>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for validating OpenZR+ transceiver thresholds.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-types">
    <name>CMIS-MODULE-50</name>
    <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
      <thresholds>
        <threshold>
          <severity>CRITICAL</severity>
```

```
            <state>
              <severity>CRITICAL</severity>
              <input-power-upper>101.000000</input-power-upper>
              <input-power-lower>8.000000</input-power-lower>
            </state>
          </threshold>
        </thresholds>
      </transceiver>
    </component>
  </components>
```

Severity MAJOR

The below commands are used to validate thresholds with major severity.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>CMIS-MODULE-50</name>
      <transceiver>
        <thresholds>
          <threshold>
            <severity>MAJOR</severity>
          </threshold>
        </thresholds>
      </transceiver>
    </component>
  </components>
</config>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for validating the OpenZR+ transceiver thresholds with major severity.

```
 <components xmlns="http://openconfig.net/yang/platform">
  <component xmlns:oc-opt-types="http://openconfig.net/yang/transport-types">
    <name>CMIS-MODULE-50</name>
    <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
      <thresholds>
        <threshold>
          <severity>MAJOR</severity>
          <state>
            <severity>MAJOR</severity>
            <input-power-upper>96.000000</input-power-upper>
            <input-power-lower>9.000000</input-power-lower>
          </state>
        </threshold>
      </thresholds>
    </transceiver>
  </component>
```

```
</components>
```

Validate OpenZR+ transceiver physical channels

Use these commands to validate OpenZR+ transceiver physical channels.

Release

This configuration was introduced in OcNOS version 6.5.1.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>CMIS-MODULE-50</name>
      <transceiver>
        <physical-channels />
      </transceiver>
    </component>
  </components>
</config>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for validating OpenZR+ transceiver channels.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>CMIS-MODULE-50</name>
    <transceiver xmlns="http://openconfig.net/yang/platform/transceiver">
      <physical-channels>
        <channel>
          <index>1</index>
          <state>
            <laser-temperature>
              <instant>0.0</instant>
            </laser-temperature>
            <index>1</index>
            <laser-age>0</laser-age>
          </state>
        </channel>
      </physical-channels>
    </transceiver>
  </component>
</components>
```

Validate OpenZR+ transceiver optical channel state

Use these commands to validate OpenZR+ transceiver optical channel state.

Release

This configuration was introduced in OcNOS version 6.5.1.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>OCH-0/50</name>
      <optical-channel>
        <state />
      </optical-channel>
    </component>
  </components>
</config>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for validating OpenZR+ transceiver optical channel state.

```
<components xmlns="http://openconfig.net/yang/platform">
  <component>
    <name>OCH-0/50</name>
    <optical-channel>
      <state>
        <input-power>
          <instant>100.00</instant>
        </input-power>
        <output-power>
          <instant>100.00</instant>
        </output-power>
        <laser-bias-current>
          <instant>0.00</instant>
        </laser-bias-current>
        <pre-fec-ber>
          <min>0.00</min>
          <max>0.00</max>
          <avg>0.00</avg>
          <instant>0.00</instant>
        </pre-fec-ber>
        <post-fec-ber>
          <min>0.00</min>
          <max>0.00</max>
          <avg>0.00</avg>
          <instant>0.00</instant>
```

```
</post-fec-ber>
<modulator-bias-xi>
  <instant>0.00</instant>
</modulator-bias-xi>
<modulator-bias-xq>
  <instant>0.00</instant>
</modulator-bias-xq>
<modulator-bias-yi>
  <instant>0.00</instant>
</modulator-bias-yi>
<modulator-bias-yq>
  <instant>0.00</instant>
</modulator-bias-yq>
<modulator-bias-x-phase>
  <instant>0.00</instant>
</modulator-bias-x-phase>
<modulator-bias-y-phase>
  <instant>0.00</instant>
</modulator-bias-y-phase>
<chromatic-dispersion>
  <max>0.00</max>
  <min>0.00</min>
</chromatic-dispersion>
<polarization-mode-dispersion>
  <instant>0.00</instant>
  <avg>0.00</avg>
  <min>0.00</min>
  <max>0.00</max>
</polarization-mode-dispersion>
<second-order-polarization-mode-dispersion>
  <instant>0.00</instant>
</second-order-polarization-mode-dispersion>
<polarization-dependent-loss>
  <instant>0.00</instant>
  <avg>0.00</avg>
  <min>0.00</min>
  <max>0.00</max>
</polarization-dependent-loss>
<osnr>
  <instant>0.00</instant>
  <avg>0.00</avg>
  <min>0.00</min>
  <max>0.00</max>
</osnr>
<esnr>
  <instant>0.00</instant>
  <avg>0.00</avg>
  <min>0.00</min>
  <max>0.00</max>
</esnr>
<carrier-frequency-offset>
  <instant>0.00</instant>
  <avg>0.00</avg>
  <min>0.00</min>
  <max>0.00</max>
</carrier-frequency-offset>
<sop-roc>
```

```
            <instant>0.00</instant>
            <avg>0.00</avg>
            <min>0.00</min>
            <max>0.00</max>
          </sop-roc>
          <fec-uncorrectable-blocks>
            <instant>0</instant>
          </fec-uncorrectable-blocks>
          <frequency>193100000</frequency>
          <target-output-power>0.00</target-output-power>
        </state>
      </optical-channel>
    </component>
  </components>
```

Validate OpenZR+ logical channels

Use these commands to validate OpenZR+ transceiver logical channels.

Release

This configuration was introduced in OcNOS version 6.5.1.

Optical channel assignment type

The index value in the Openconfig datamodel is shown in ASCII bytes format.

Transforming the index value to the hexadecimal, it is in the format 0xFFSSMMHH, where:

- FF is fp-port (in hexadecimal format);
- SS is slot index, fixed to 0 in case of CMIS modules (in hexadecimal format);
- MM is the optical channel media lane (in hexadecimal format);
- HH is the host lane to which the data-path is assigned (in hexadecimal format).

For example, to calculate the index for an optical channel assignment type:

- fp-port 50 (0x32 in hexadecimal);
- slot-index 0 (0x00 in hexadecimal);
- optical channel media lane 1 (0x01 in hexadecimal);
- host lane 0 (0x00 in hexadecimal).

Index in hexadecimal: 0x32000100

Transforming it to the ASCII bytes format: 838861056

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<config>
  <terminal-device xmlns="http://openconfig.net/yang/terminal-device">
    <logical-channels>
      <channel>
```

```
        <index>838861056</index>
      </channel>
    </logical-channels>
  </terminal-device>
</config>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for validating OpenZR+ logical channels.

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
  <logical-channels>
    <channel>
      <index>838861056</index>
      <logical-channel-assignments>
        <assignment>
          <index>1</index>
          <state>
            <assignment-type>OPTICAL_CHANNEL</assignment-type>
            <optical-channel>OCH-0/50</optical-channel>
            <index>1</index>
            <allocation>400.000</allocation>
          </state>
        </assignment>
      </logical-channel-assignments>
      <config>
        <logical-channel-type
          xmlns:oc-opt-types="http://openconfig.net/yang/transport-types">oc-
opt-types:PROT_OTN</logical-channel-type>
      </config>
      <state>
        <logical-channel-type
          xmlns:oc-opt-types="http://openconfig.net/yang/transport-types">oc-
opt-types:PROT_OTN</logical-channel-type>
      </state>
    </channel>
  </logical-channels>
</terminal-device>
```

Logical channel assignment type

The index value in the Openconfig datamodel is shown in ASCII bytes format.

Transforming the index value to the hexadecimal, it is in the format 0xFFSSMMHH, where:

- FF is the fp-port (in hexadecimal format);
- SS is the slot-index, fixed to 0 in case of CMIS modules (in hexadecimal format);
- MM is the optical channel media lane (in hexadecimal format);
- HH is the host lane to which the data-path is assigned (in hexadecimal format).

For example, to calculate the index for an logical channel assignment type:

- fp-port 50 (0x32 in hexadecimal);
- slot-index 0 (0x00 in hexadecimal);
- optical channel media lane 0 (0x00 in hexadecimal);

- host lane 1 (0x01 in hexadecimal).

Index in hexadecimal: 0x32000001

Transforming it to the ASCII bytes format: 838860801

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<config>
  <terminal-device xmlns="http://openconfig.net/yang/terminal-device">
    <logical-channels>
      <channel>
        <index>838860801</index>
      </channel>
    </logical-channels>
  </terminal-device>
</config>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for validating OpenZR+ logical channels.

```
<terminal-device xmlns="http://openconfig.net/yang/terminal-device">
  <logical-channels>
    <channel>
      <index>838860801</index>
      <logical-channel-assignments>
        <assignment>
          <index>1</index>
          <state>
            <assignment-type>LOGICAL_CHANNEL</assignment-type>
            <logical-channel>838861056</logical-channel>
            <index>1</index>
            <allocation>400.000</allocation>
          </state>
        </assignment>
      </logical-channel-assignments>
      <config>
        <logical-channel-type
          xmlns:oc-opt-types="http://openconfig.net/yang/transport-types">oc-
opt-types:PROT_ETHERNET</logical-channel-type>
      </config>
      <state>
        <logical-channel-type
          xmlns:oc-opt-types="http://openconfig.net/yang/transport-types">oc-
opt-types:PROT_ETHERNET</logical-channel-type>
      </state>
      <ingress>
        <state>
          <interface>cd50</interface>
        </state>
      </ingress>
      <ethernet>
        <state>
```

```
            <pre-fec-ber>
              <min>0.0</min>
              <max>0.0</max>
              <avg>0.0</avg>
              <instant>0.0</instant>
            </pre-fec-ber>
            <post-fec-ber>
              <min>0.0</min>
              <max>0.0</max>
              <avg>0.0</avg>
              <instant>0.0</instant>
            </post-fec-ber>
            <out-8021q-frames>0</out-8021q-frames>
            <fec-uncorrectable-blocks>0</fec-uncorrectable-blocks>
          </state>
        </ethernet>
        <state>
          <index>838860801</index>
        </state>
      </channel>
    </logical-channels>
</terminal-device>
```

Configure OpenZR+ port-breakout

Use the commands to configure OpenZR+ port-breakout.

Release

This configuration was introduced in OcNOS version 6.5.1.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to configure OpenZR+ port-breakout.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>PORT-CMIS-MODULE-50</name>
      <port>
        <breakout-mode xmlns="http://openconfig.net/yang/platform/port">
          <groups>
            <group>
              <index>0</index>
              <config>
                <index>0</index>
                <num-breakouts>1</num-breakouts>
                <breakout-speed xmlns="http://openconfig.net/yang/interfaces/
ethernet">SPEED_100GB</breakout-speed>
                <num-physical-channels>4</num-physical-channels>
              </config>
            </group>
          </groups>
        </breakout-mode>
```

```
      </port>
      <config>
        <name>PORT-CMIS-MODULE-50</name>
      </config>
    </component>
  </components>
</config>
```

OcNOS CLI Command

The below CLI command is used to configure OpenZR+ port-breakout.

```
 port cd50 breakout 1X100g serdes 25g
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to configure OpenZR+ port-breakout.

```
<port-breakout xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-port-breakout">
  <breakouts>
    <breakout>
      <interface>cd50</interface>
      <config>
        <interface>cd50</interface>
        <mode>1X100g</mode>
        <serdes>25g</serdes>
      </config>
    </breakout>
  </breakouts>
</port-breakout>
```

Unconfiguration

Use these commands to unconfigure OpenZR+ port-breakout.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to unconfigure OpenZR+ port-breakout.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>PORT-CMIS-MODULE-50</name>
      <port>
        <breakout-mode xmlns="http://openconfig.net/yang/platform/port">
          <groups>
            <group operation="delete">
              <index>0</index>
              <config>
                <index>0</index>
                <num-breakouts>1</num-breakouts>
                <breakout-speed xmlns="http://openconfig.net/yang/interfaces/
ethernet">SPEED_100GB</breakout-speed>
                <num-physical-channels>4</num-physical-channels>
              </config>
```

```
            </group>
          </groups>
        </breakout-mode>
      </port>
      <config>
        <name>PORT-CMIS-MODULE-50</name>
      </config>
    </component>
  </components>
</config>
```

OcNOS CLI Command

The below CLI command is used to unconfigure OpenZR+ port-breakout.

```
no port cd50 breakout
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to unconfigure OpenZR+ port-breakout.

```
<port-breakout xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-port-breakout">
  <breakouts>
    <breakout operation="delete">
      <interface>cd50</interface>
    </breakout>
  </breakouts>
</port-breakout>
```

Validate OpenZR+ port-breakout

Use these commands to validate OpenZR+ port-breakout.

Release

This configuration was introduced in OcNOS version 6.5.1.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>CMIS-MODULE-50</name>
      <port>
        <breakout-mode>
          <groups>
            <group>
              <index>0</index>
              <state />
            </group>
          </groups>
```

```
        </breakout-mode>
      </port>
    </component>
  </components>
</config>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for validating OpenZR+ port-breakout.

```
<config>
  <components xmlns="http://openconfig.net/yang/platform">
    <component>
      <name>PORT-CMIS-MODULE-50</name>
      <port>
        <breakout-mode xmlns="http://openconfig.net/yang/platform/port">
          <groups>
            <group>
              <index>0</index>
              <state>
                <index>0</index>
                <num-breakouts>1</num-breakouts>
                <breakout-speed xmlns="http://openconfig.net/yang/interfaces/
ethernet">SPEED_100GB</breakout-speed>
                <num-physical-channels>4</num-physical-channels>
              </state>
            </group>
          </groups>
        </breakout-mode>
      </port>
    </component>
  </components>
</config>
```

Validate OpenZR+ Operational Modes

Use the commands to validate QSFP-DD Mode Descriptor module state.

Release

This configuration was introduced in OcNOS version 6.6.0.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<operational-modes xmlns="http://openconfig.net/yang/openconfig-terminal-
device-properties">
 <mode-descriptor>
   <mode-id>4901</mode-id>
  </mode-descriptor>
</operational-modes>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime for validating OpenZR+ Operational Modes.

```
<operational-modes xmlns="http://openconfig.net/yang/openconfig-terminal-
device-properties">
  <mode-descriptor>
    <mode-id>5001</mode-id>
    <state>
      <mode-type
        xmlns:oc-opt-term-prop-types="http://openconfig.net/yang/openconfig-
terminal-device-property-types">oc-opt-term-prop-
types:TRANSCEIVER_MODE_TYPE_EXPLICIT</mode-type>
      <mode-id>5001</mode-id>
    </state>
    <explicit-mode>
      <operational-mode-capabilities>
        <state>
          <bit-rate
            xmlns:oc-opt-types="http://openconfig.net/yang/transport-
types">oc-opt-types:TRIB_RATE_500G</bit-rate>
          <baud-rate>59.84375</baud-rate>
          <modulation-format>MODULATION_FORMAT_DP_16QAM</modulation-format>
        </state>
      </operational-mode-capabilities>
      <optical-channel-config-value-constraints>
        <state>
          <adjustment-granularity
            xmlns:oc-opt-term-prop-types="http://openconfig.net/yang/
openconfig-terminal-device-property-types">oc-opt-term-prop-types:G_3_125GHZ</
adjustment-granularity>
          <min-output-power>-22.900</min-output-power>
          <max-output-power>4.000</max-output-power>
          <min-central-frequency>191274992</min-central-frequency>
          <max-central-frequency>196100000</max-central-frequency>
        </state>
      </optical-channel-config-value-constraints>
    </explicit-mode>
  </mode-descriptor>
</operational-modes>
```

BFD OpenConfig Translation

Create BFD Sessions over Routing Protocols

ISIS

For information on ISIS configuration, refer the section Configure Interface BFD Parameter.

OSPF

For information on OSPF configuration, refer the section Create OSPF Process.

BGP

For information on BGP configuration, refer the section Create BGP Neighbors.

Static Routes

For information on Static Routes configuration, refer the chapter Static Route OpenConfig Translation.

Configuration

Use this configuration to create BFD sessions over routing protocols.

OpenConfig NetConf Payload

Here is a sample OpenConfig NetConf Payload to create BFD sessions over routing protocols.

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:STATIC</identifier>
        <name>static-routes</name>
        <static-routes>
          <static>
            <prefix>30.1.1.0/24</prefix>
            <next-hops>
              <next-hop>
                <index>20.1.1.3</index>
                <config>
                  <next-hop>20.1.1.3</next-hop>
```

```
                  <index>20.1.1.3</index>
                </config>
                <enable-bfd>
                  <config>
                    <enabled>true</enabled>
                  </config>
                </enable-bfd>
              </next-hop>
            </next-hops>
            <config>
              <prefix>30.1.1.0/24</prefix>
            </config>
          </static>
        </static-routes>
      </protocol>
    </protocols>
  </network-instance>
  <network-instance>
    <name>management</name>
  </network-instance>
</network-instances>
```

OcNOS CLI Command

The below CLI command is used to create BFD sessions over routing protocols.

```
 interface eth1
 ip address 20.1.1.2/24
!
interface eth2
 ip address 10.1.1.1/24
!
ip route 30.1.1.0/24 20.1.1.3
ip static 30.1.1.0/24 20.1.1.3 fall-over-bfd enable
commit
```

OcNOS NetConf Payload

Here is a sample OcNOS NetConf Payload to create BFD sessions over routing protocols.

```
<routing xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-rib">
  <static-routes>
    <ipv4>
      <routes>
        <route>
          <destination-prefix>30.1.1.0/24</destination-prefix>
          <gateway-address>20.1.1.3</gateway-address>
          <config>
            <destination-prefix>30.1.1.0/24</destination-prefix>
            <gateway-address>20.1.1.3</gateway-address>
            <bfd-state>enable</bfd-state>
          </config>
        </route>
      </routes>
    </ipv4>
  </static-routes>
```

```
</routing>
```

Validation with NetConf get

Here is the NetConf validation response:

```
<network-instances xmlns="http://openconfig.net/yang/network-instance">
  <network-instance>
    <name>default</name>
    <protocols>
      <protocol>
        <identifier
          xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-pol-
types:STATIC</identifier>
        <name>static-routes</name>
        <static-routes>
          <static>
            <prefix>30.1.1.0/24</prefix>
            <next-hops>
              <next-hop>
                <index>20.1.1.3</index>
                <config>
                  <next-hop>20.1.1.3</next-hop>
                  <index>20.1.1.3</index>
                </config>
                <enable-bfd>
                  <config>
                    <enabled>true</enabled>
                  </config>
                </enable-bfd>
              </next-hop>
            </next-hops>
            <config>
              <prefix>30.1.1.0/24</prefix>
            </config>
          </static>
        </static-routes>
      </protocol>
    </protocols>
  </network-instance>
  <network-instance>
    <name>management</name>
  </network-instance>
</network-instances>
```

Restrictions

None.

Configure BFD Interface Intervals

Release

This configuration was introduced in OcNOS version 6.6.0.

Configuration

Use this configuration to configure BFD interface intervals.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to configure BFD interface intervals.

```
<bfd xmlns="http://openconfig.net/yang/bfd">
  <interfaces>
    <interface>
      <id>eth1</id>
      <config>
        <id>eth1</id>
        <enabled>true</enabled>
        <desired-minimum-tx-interval>100</desired-minimum-tx-interval>
        <required-minimum-receive>200</required-minimum-receive>
        <detection-multiplier>4</detection-multiplier>
      </config>
      <interface-ref>
        <config>
          <interface>eth1</interface>
        </config>
      </interface-ref>
    </interface>
  </interfaces>
</bfd>
```

OcNOS CLI command

The below CLI command is used to configure BFD interface intervals.

```
interface eth1
 bfd interval 100 minrx 200 multiplier 4
commit
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to configure BFD interface intervals.

```
    <bfd xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bfd">
  <interfaces>
    <interface>
      <name>eth1</name>
      <config>
        <name>eth1</name>
```

```
        </config>
        <intervals>
          <interval>
            <desired-minimum-tx-interval>100</desired-minimum-tx-interval>
            <required-minimum-rx-interval>200</required-minimum-rx-interval>
            <detection-multiplier>4</detection-multiplier>
            <config>
              <desired-minimum-tx-interval>100</desired-minimum-tx-interval>
              <required-minimum-rx-interval>200</required-minimum-rx-interval>
              <detection-multiplier>4</detection-multiplier>
            </config>
          </interval>
        </intervals>
      </interface>
    </interfaces>
  </bfd>
```

Validation with NETCONF get

Here is a NetConf validation response:

```
  <rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
    <data>
      <bfd xmlns="http://openconfig.net/yang/bfd">
        <interfaces>
          <interface>
            <id>eth1</id>
            <config>
              <id>eth1</id>
              <enabled>true</enabled>
              <desired-minimum-tx-interval>100</desired-minimum-tx-interval>
              <required-minimum-receive>200</required-minimum-receive>
              <detection-multiplier>4</detection-multiplier>
            </config>
            <interface-ref>
              <config>
                <interface>eth1</interface>
              </config>
              <state>
                <interface>eth1</interface>
              </state>
            </interface-ref>
            <state>
              <enable-per-member-link>false</enable-per-member-link>
              <id>eth1</id>
              <enabled>true</enabled>
              <desired-minimum-tx-interval>100</desired-minimum-tx-interval>
              <required-minimum-receive>200</required-minimum-receive>
              <detection-multiplier>4</detection-multiplier>
            </state>
          </interface>
        </interfaces>
      </bfd>
    </data>
  </rpc-reply>
```

Restrictions

The command `/bfd/interfaces/interface[id='eth1']/config` uses `ipi-oc-bfd-deviations` to set a constraint on OpenConfig where all three intervals attributes must be set together. So leaves d`esired-minimum-tx-interval`, `required-minimum-receive` and `detection-multiplier` must be present in payload so that it can be accepted. For deletion, operation “delete” or “remove” must be present in the three attributes at the same time.

/`bfd/interfaces/interface[id='eth1']/interface-ref/config/interface` must be the same as `/bfd/interfaces/interface/id`.

Disable BFD on Interface

Release

This configuration was introduced in OcNOS version 6.6.0.

Configuration

Use this configuration to disable BFD on interface.

OpenConfig NETCONF Payload

Here is a sample OpenConfig NetConf Payload to disable BFD on interface.

```
<bfd xmlns="http://openconfig.net/yang/bfd">
  <interfaces>
    <interface>
      <id>eth1</id>
      <config>
        <id>eth1</id>
        <enabled>false</enabled>
      </config>
      <interface-ref>
        <config>
          <interface>eth1</interface>
        </config>
      </interface-ref>
    </interface>
  </interfaces>
</bfd>
```

OcNOS CLI command

The below CLI command is used to disable BFD on interface.

```
interface eth1
 bfd disable
commit
```

OcNOS NETCONF Payload

Here is a sample OcNOS NetConf Payload to disable BFD on interface.

```
        <bfd xmlns="http://www.ipinfusion.com/yang/ocnos/ipi-bfd">
      <interfaces>
        <interface>
          <name>eth1</name>
          <config>
            <name>eth1</name>
            <bfd-disabled />
          </config>
        </interface>
      </interfaces>
    </bfd>
```

Validation with NETCONF get

Here is a NetConf validation response:

```
    <rpc-reply xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">
      <data>
        <bfd xmlns="http://openconfig.net/yang/bfd">
          <interfaces>
            <interface>
              <id>eth1</id>
              <config>
                <id>eth1</id>
                <enabled>false</enabled>
              </config>
              <interface-ref>
                <config>
                  <interface>eth1</interface>
                </config>
                <state>
                  <interface>eth1</interface>
                </state>
              </interface-ref>
              <state>
                <enable-per-member-link>false</enable-per-member-link>
                <id>eth1</id>
                <enabled>false</enabled>
              </state>
            </interface>
          </interfaces>
        </bfd>
      </data>
    </rpc-reply>
```

Restrictions

/`bfd/interfaces/interface[id='eth1']/interface-ref/config/interface` must be the same as `/bfd/interfaces/interface/id`.

Validate BFD micro-bfd-sessions state

Release

This configuration was introduced in OcNOS version 6.6.0.

Validation

Use these commands to validate BFD micro-bfd-sessions state. Micro BFD sessions are created automatically for each member-interface of the aggregated link when a session is configured in a PO or SA interface.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<bfd xmlns="http://openconfig.net/yang/bfd">
  <interfaces>
    <interface>
      <id>po1</id>
      <micro-bfd-sessions>
        <micro-bfd-session>
          <state />
        </micro-bfd-session>
      </micro-bfd-sessions>
    </interface>
  </interfaces>
</bfd>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime to validate BFD micro-bfd-sessions state.

```
<bfd xmlns="http://openconfig.net/yang/bfd">
  <interfaces>
    <interface>
      <id>po1</id>
      <micro-bfd-sessions>
        <micro-bfd-session>
          <member-interface>xe12</member-interface>
          <state>
            <member-interface>xe12</member-interface>
            <remote-session-state>UP</remote-session-state>
            <remote-diagnostic-code>NO_DIAGNOSTIC</remote-diagnostic-code>
            <remote-discriminator>1</remote-discriminator>
            <session-state>UP</session-state>
            <local-diagnostic-code>NO_DIAGNOSTIC</local-diagnostic-code>
          </state>
        </micro-bfd-session>
      </micro-bfd-sessions>
    </interface>
  </interfaces>
```

```
</bfd>
```

Validate BFD Peers State

Release

This configuration was introduced in OcNOS version 6.6.0.

Validation

Use these commands to validate BFD peers state.

Get OpenConfig Payload

This filter for the Get operation results in the Get OpenConfig Return output shown below.

```
<bfd xmlns="http://openconfig.net/yang/bfd">
  <interfaces>
    <interface>
      <id>eth1</id>
      <peers>
        <peer>
          <state />
        </peer>
      </peers>
    </interface>
  </interfaces>
</bfd>
```

Get OpenConfig Return

This validation response provides information on the configuration and runtime to validate BFD peers state.

```
<<bfd xmlns="http://openconfig.net/yang/bfd">
  <interfaces>
    <interface>
      <id>eth1</id>
      <peers>
        <peer>
          <local-discriminator>1</local-discriminator>
          <state>
            <remote-authentication-enabled>false</remote-authentication-
enabled>
            <remote-address>10.1.1.2</remote-address>
            <local-address>10.1.1.1</local-address>
            <remote-discriminator>1</remote-discriminator>
            <local-discriminator>1</local-discriminator>
            <session-state>UP</session-state>
            <local-diagnostic-code>NO_DIAGNOSTIC</local-diagnostic-code>
            <remote-minimum-receive-interval>250</remote-minimum-receive-
interval>
            <echo>
              <up-transitions>1</up-transitions>
```

```
              <transmitted-packets>0</transmitted-packets>
              <active>false</active>
            </echo>
            <async>
              <up-transitions>1</up-transitions>
              <transmitted-packets>1683</transmitted-packets>
              <received-packets>1683</received-packets>
            </async>
            <demand-mode-requested>false</demand-mode-requested>
            <subscribed-protocols
              xmlns:oc-pol-types="http://openconfig.net/yang/policy-types">oc-
pol-types:ISIS</subscribed-protocols>
          </state>
        </peer>
      </peers>
    </interface>
  </interfaces>
</bfd>
```

PYANG Tree

openconfig-acl

```
+--rw acl
   +--rw acl-sets
   |  +--rw acl-set* [name type]
   |     +--rw name           -> ../config/name
   |     +--rw type           -> ../config/type
   |     +--rw config
   |     |  +--rw name?          string
   |     |  +--rw type?          identityref
   |     |  +--rw description?   string
   |     +--ro state
   |     |  +--ro name?          string
   |     |  +--ro type?          identityref
   |     |  +--ro description?   string
   |     +--rw acl-entries
   |        +--rw acl-entry* [sequence-id]
   |           +--rw sequence-id    -> ../config/sequence-id
   |           +--rw config
   |           |  +--rw sequence-id?   uint32
   |           +--ro state
   |           |  +--ro sequence-id?   uint32
   |           +--rw l2
   |           |  +--rw config
   |           |  |  +--rw source-mac?             openconfig-yang-types:mac-address
   |           |  |  +--rw source-mac-mask?        openconfig-yang-types:mac-address
   |           |  |  +--rw destination-mac?        openconfig-yang-types:mac-address
   |           |  |  +--rw destination-mac-mask?   openconfig-yang-types:mac-address
   |           |  |  +--rw ethertype?              oc-pkt-match-types:ethertype-type
   |           |  +--ro state
   |           |     +--ro source-mac?             openconfig-yang-types:mac-address
   |           |     +--ro source-mac-mask?        openconfig-yang-types:mac-address
   |           |     +--ro destination-mac?        openconfig-yang-types:mac-address
   |           |     +--ro destination-mac-mask?   openconfig-yang-types:mac-address
   |           |     +--ro ethertype?              oc-pkt-match-types:ethertype-type
   |           +--rw ipv4
   |           |  +--rw config
   |           |  |  +--rw source-address?        oc-inet:ipv4-prefix
   |           |  |  +--rw destination-address?   oc-inet:ipv4-prefix
   |           |  |  +--rw dscp?                  oc-inet:dscp
   |           |  |  +--rw protocol?              oc-pkt-match-types:ip-protocol-type
   |           |  +--ro state
   |           |     +--ro source-address?        oc-inet:ipv4-prefix
   |           |     +--ro destination-address?   oc-inet:ipv4-prefix
```

```
     |           |     +--ro dscp?                  oc-inet:dscp
     |           |     +--ro protocol?              oc-pkt-match-types:ip-protocol-type
     |           +--rw ipv6
     |           |  +--rw config
     |           |  |  +--rw source-address?        oc-inet:ipv6-prefix
     |           |  |  +--rw source-flow-label?     oc-inet:ipv6-flow-label
     |           |  |  +--rw destination-address?   oc-inet:ipv6-prefix
     |           |  |  +--rw dscp?                  oc-inet:dscp
     |           |  |  +--rw protocol?              oc-pkt-match-types:ip-protocol-type
     |           |  +--ro state
     |           |     +--ro source-address?        oc-inet:ipv6-prefix
     |           |     +--ro destination-address?   oc-inet:ipv6-prefix
     |           |     +--ro dscp?                  oc-inet:dscp
     |           |     +--ro protocol?              oc-pkt-match-types:ip-protocol-type
     |           +--rw transport
     |           |  +--rw config
     |           |  |  +--rw source-port?          oc-pkt-match-types:port-num-range
     |           |  |  +--rw destination-port?     oc-pkt-match-types:port-num-range
     |           |  |  +--rw detail-mode?          enumeration
     |           |  |  +--rw explicit-tcp-flags*   identityref
     |           |  +--ro state
     |           |     +--ro source-port?          oc-pkt-match-types:port-num-range
     |           |     +--ro destination-port?     oc-pkt-match-types:port-num-range
     |           |     +--ro detail-mode?          enumeration
     |           |     +--ro explicit-tcp-flags*   identityref
     |           +--rw actions
     |              +--rw config
     |              |  +--rw forwarding-action    identityref
     |              |  +--rw log-action?          identityref
     |              +--ro state
     |                 +--ro forwarding-action    identityref
     |                 +--ro log-action?          identityref
     +--rw interfaces
        +--rw interface* [id]
           +--rw id                  -> ../config/id
           +--rw config
           |  +--rw id?   openconfig-interfaces:interface-id
           +--ro state
           |  +--ro id?   openconfig-interfaces:interface-id
           +--rw interface-ref
           |  +--rw config
           |  |  +--rw interface?      -> /openconfig-interfaces:interfaces/interface/
name
           |  |  +--rw subinterface?   -> /openconfig-interfaces:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
           |  +--ro state
           |     +--ro interface?      -> /openconfig-interfaces:interfaces/interface/
name
           |     +--ro subinterface?   -> /openconfig-interfaces:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
           +--rw ingress-acl-sets
```

```
           |  +--rw ingress-acl-set* [set-name type]
           |     +--rw set-name    -> ../config/set-name
           |     +--rw type        -> ../config/type
           |     +--rw config
           |     |  +--rw set-name?   -> ../../../../../../acl-sets/acl-set/config/name
           |     |  +--rw type?       -> ../../../../../../acl-sets/acl-
set[name=current()/../set-name]/config/type
           |     +--ro state
           |        +--ro set-name?   -> ../../../../../../acl-sets/acl-set/config/name
           |        +--ro type?       -> ../../../../../../acl-sets/acl-
set[name=current()/../set-name]/config/type
           +--rw egress-acl-sets
              +--rw egress-acl-set* [set-name type]
                 +--rw set-name    -> ../config/set-name
                 +--rw type        -> ../config/type
                 +--rw config
                 |  +--rw set-name?   -> ../../../../../../acl-sets/acl-set/config/name
                 |  +--rw type?       -> ../../../../../../acl-sets/acl-
set[name=current()/../set-name]/config/type
                 +--ro state
                    +--ro set-name?   -> ../../../../../../acl-sets/acl-set/config/name
                    +--ro type?       -> ../../../../../../acl-sets/acl-
set[name=current()/../set-name]/config/type
```

openconfig-bfd

```
  +--rw bfd
     +--rw interfaces
        +--rw interface* [id]
           +--rw id                     -> ../config/id
           +--rw config
           |  +--rw id?                              openconfig-interfaces:interface-id
           |  +--rw enabled?                         boolean
           |  +--rw desired-minimum-tx-interval?     uint32
           |  +--rw required-minimum-receive?        uint32
           |  +--rw detection-multiplier?            uint8
           +--ro state
           |  +--ro id?                              openconfig-interfaces:interface-id
           |  +--ro enabled?                         boolean
           |  +--ro desired-minimum-tx-interval?     uint32
           |  +--ro required-minimum-receive?        uint32
           |  +--ro detection-multiplier?            uint8
           |  +--ro enable-per-member-link?          boolean
           +--rw interface-ref
           |  +--rw config
           |  |  +--rw interface?      -> /openconfig-interfaces:interfaces/interface/
name
           |  |  +--rw subinterface?   -> /openconfig-interfaces:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
           |  +--ro state
```

```
           |     +--ro interface?      -> /openconfig-interfaces:interfaces/interface/
name
          |     +--ro subinterface?   -> /openconfig-interfaces:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
           +--rw micro-bfd-sessions
           |  +--ro micro-bfd-session* [member-interface]
           |     +--ro member-interface    -> ../state/member-interface
           |     +--ro state
           |        +--ro member-interface?        -> /openconfig-interfaces:interfaces/
interface/config/name
           |        +--ro session-state?            bfd-session-state
           |        +--ro remote-session-state?     bfd-session-state
           |        +--ro local-discriminator?      string
           |        +--ro remote-discriminator?     string
           |        +--ro local-diagnostic-code?    bfd-diagnostic-code
           |        +--ro remote-diagnostic-code?   bfd-diagnostic-code
           +--rw peers
              +--ro peer* [local-discriminator]
                 +--ro local-discriminator    -> ../state/local-discriminator
                 +--ro state
                    +--ro local-address?                    openconfig-inet-types:ip-
address
                    +--ro remote-address?                   openconfig-inet-types:ip-
address
                    +--ro subscribed-protocols*             identityref
                    +--ro session-state?                    bfd-session-state
                    +--ro remote-session-state?             bfd-session-state
                    +--ro local-discriminator?              string
                    +--ro remote-discriminator?             string
                    +--ro local-diagnostic-code?            bfd-diagnostic-code
                    +--ro remote-minimum-receive-interval?  uint32
                    +--ro demand-mode-requested?            boolean
                    +--ro remote-authentication-enabled?    boolean
                    +--ro echo
                    |  +--ro active?                boolean
                    |  +--ro transmitted-packets?   uint64
                    |  +--ro up-transitions?        uint64
                    +--ro async
                       +--ro transmitted-packets?   uint64
                       +--ro received-packets?      uint64
                       +--ro up-transitions?        uint64
```

openconfig-if-aggregate

```
  augment /oc-if:interfaces/oc-if:interface/oc-eth:ethernet/oc-eth:config:
    +--rw aggregate-id?   -> /openconfig-interfaces:interfaces/interface/name
  augment /oc-if:interfaces/oc-if:interface/oc-eth:ethernet/oc-eth:state:
    +--ro aggregate-id?   -> /openconfig-interfaces:interfaces/interface/name
```

openconfig-if-ip

```
  augment /oc-if:interfaces/oc-if:interface/oc-vlan:routed-vlan:
    +--rw ipv4
       +--rw addresses
       |  +--rw address* [ip]
       |     +--rw ip        -> ../config/ip
       |     +--rw config
       |     |  +--rw ip?              openconfig-inet-types:ipv4-address
       |     |  +--rw prefix-length?   uint8
       |     |  +--rw type?            ipv4-address-type
       |     +--ro state
       |     |  +--ro ip?              openconfig-inet-types:ipv4-address
       |     |  +--ro prefix-length?   uint8
       |     |  +--ro type?            ipv4-address-type
       |     |  +--ro origin?          ip-address-origin
       |     +--rw vrrp
       |        +--rw vrrp-group* [virtual-router-id]
       |           +--rw virtual-router-id     -> ../config/virtual-router-id
       |           +--rw config
       |           |  +--rw virtual-router-id?        uint8
       |           |  +--rw virtual-address*          openconfig-inet-types:ip-address
       |           |  +--rw priority?                 uint8
       |           |  +--rw preempt?                  boolean
       |           |  +--rw preempt-delay?            uint16
       |           |  +--rw accept-mode?              boolean
       |           |  +--rw advertisement-interval?   uint16
       |           +--ro state
       |           |  +--ro virtual-router-id?        uint8
       |           |  +--ro virtual-address*          openconfig-inet-types:ip-address
       |           |  +--ro priority?                 uint8
       |           |  +--ro preempt?                  boolean
       |           |  +--ro preempt-delay?            uint16
       |           |  +--ro accept-mode?              boolean
       |           |  +--ro advertisement-interval?   uint16
       |           |  +--ro current-priority?         uint8
       |           +--rw interface-tracking
       |              +--rw config
       |              |  +--rw track-interface*     -> /openconfig-interfaces:interfaces/
interface/name
       |              |  +--rw priority-decrement?   uint8
       |              +--ro state
       |              |  +--ro track-interface*     -> /openconfig-interfaces:interfaces/
interface/name
       |                 +--ro priority-decrement?   uint8
       +--rw proxy-arp
       |  +--rw config
       |  |  +--rw mode?   enumeration
       |  +--ro state
       |     +--ro mode?   enumeration
```

```
       +--rw neighbors
       |  +--rw neighbor* [ip]
       |     +--rw ip        -> ../config/ip
       |     +--rw config
       |     |  +--rw ip?                   openconfig-inet-types:ipv4-address
       |     |  +--rw link-layer-address    openconfig-yang-types:phys-address
       |     +--ro state
       |        +--ro ip?                   openconfig-inet-types:ipv4-address
       |        +--ro link-layer-address    openconfig-yang-types:phys-address
       |        +--ro origin?               neighbor-origin
       +--rw unnumbered
       |  +--rw config
       |  |  +--rw enabled?   boolean
       |  +--ro state
       |  |  +--ro enabled?   boolean
       |  +--rw interface-ref
       |     +--rw config
       |     |  +--rw interface?     -> /openconfig-interfaces:interfaces/interface/name
       |     |  +--rw subinterface?   -> /openconfig-interfaces:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
       |     +--ro state
       |       +--ro interface?     -> /openconfig-interfaces:interfaces/interface/name
       |        +--ro subinterface?   -> /openconfig-interfaces:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
       +--rw config
       |  +--rw enabled?       boolean
       |  +--rw mtu?           uint16
       |  +--rw dhcp-client?   boolean
       +--ro state
          +--ro enabled?       boolean
          +--ro mtu?           uint16
          +--ro dhcp-client?   boolean
          +--ro counters
             +--ro in-pkts?                openconfig-yang-types:counter64
             +--ro in-octets?              openconfig-yang-types:counter64
             +--ro in-multicast-pkts?      openconfig-yang-types:counter64
             +--ro in-multicast-octets?    openconfig-yang-types:counter64
             +--ro in-error-pkts?          openconfig-yang-types:counter64
             +--ro in-forwarded-pkts?      openconfig-yang-types:counter64
             +--ro in-forwarded-octets?    openconfig-yang-types:counter64
             +--ro in-discarded-pkts?      openconfig-yang-types:counter64
             +--ro out-pkts?               openconfig-yang-types:counter64
             +--ro out-octets?             openconfig-yang-types:counter64
             +--ro out-multicast-pkts?     openconfig-yang-types:counter64
             +--ro out-multicast-octets?   openconfig-yang-types:counter64
             +--ro out-error-pkts?         openconfig-yang-types:counter64
             +--ro out-forwarded-pkts?     openconfig-yang-types:counter64
             +--ro out-forwarded-octets?   openconfig-yang-types:counter64
             +--ro out-discarded-pkts?     openconfig-yang-types:counter64
  augment /oc-if:interfaces/oc-if:interface/oc-vlan:routed-vlan:
    +--rw ipv6
```

```
       +--rw addresses
       |  +--rw address* [ip]
       |     +--rw ip        -> ../config/ip
       |     +--rw config
       |     |  +--rw ip?              openconfig-inet-types:ipv6-address
       |     |  +--rw prefix-length    uint8
       |     |  +--rw type?            openconfig-inet-types:ipv6-address-type
       |     +--ro state
       |     |  +--ro ip?              openconfig-inet-types:ipv6-address
       |     |  +--ro prefix-length    uint8
       |     |  +--ro type?            openconfig-inet-types:ipv6-address-type
       |     |  +--ro origin?          ip-address-origin
       |     |  +--ro status?          enumeration
       |     +--rw vrrp
       |        +--rw vrrp-group* [virtual-router-id]
       |           +--rw virtual-router-id     -> ../config/virtual-router-id
       |           +--rw config
       |           |  +--rw virtual-router-id?        uint8
       |           |  +--rw virtual-address*          openconfig-inet-types:ip-address
       |           |  +--rw priority?                 uint8
       |           |  +--rw preempt?                  boolean
       |           |  +--rw preempt-delay?            uint16
       |           |  +--rw accept-mode?              boolean
       |           |  +--rw advertisement-interval?   uint16
       |           |  +--rw virtual-link-local?       openconfig-inet-types:ip-address
       |           +--ro state
       |           |  +--ro virtual-router-id?        uint8
       |           |  +--ro virtual-address*          openconfig-inet-types:ip-address
       |           |  +--ro priority?                 uint8
       |           |  +--ro preempt?                  boolean
       |           |  +--ro preempt-delay?            uint16
       |           |  +--ro accept-mode?              boolean
       |           |  +--ro advertisement-interval?   uint16
       |           |  +--ro current-priority?         uint8
       |           |  +--ro virtual-link-local?       openconfig-inet-types:ip-address
       |           +--rw interface-tracking
       |              +--rw config
      |              |  +--rw track-interface*     -> /openconfig-interfaces:interfaces/
interface/name
       |              |  +--rw priority-decrement?   uint8
       |              +--ro state
      |               +--ro track-interface*     -> /openconfig-interfaces:interfaces/
interface/name
       |                 +--ro priority-decrement?   uint8
       +--rw router-advertisement
       |  +--rw config
       |  |  +--rw enable?         boolean
       |  |  +--rw interval?       uint32
       |  |  +--rw lifetime?       uint32
       |  |  x--rw suppress?       boolean
       |  |  +--rw mode?           enumeration
```

```
       |  |  +--rw managed?        boolean
       |  |  +--rw other-config?   boolean
       |  +--ro state
       |  |  +--ro enable?         boolean
       |  |  +--ro interval?       uint32
       |  |  +--ro lifetime?       uint32
       |  |  x--ro suppress?       boolean
       |  |  +--ro mode?           enumeration
       |  |  +--ro managed?        boolean
       |  |  +--ro other-config?   boolean
       |  +--rw prefixes
       |     +--rw prefix* [prefix]
       |        +--rw prefix    -> ../config/prefix
       |        +--rw config
       |        |  +--rw prefix?                     openconfig-inet-types:ipv6-prefix
       |        |  +--rw valid-lifetime?             uint32
       |        |  +--rw preferred-lifetime?         uint32
       |        |  +--rw disable-advertisement?      boolean
       |        |  +--rw disable-autoconfiguration?  boolean
       |        |  +--rw enable-onlink?              boolean
       |        +--ro state
       |           +--ro prefix?                     openconfig-inet-types:ipv6-prefix
       |           +--ro valid-lifetime?             uint32
       |           +--ro preferred-lifetime?         uint32
       |           +--ro disable-advertisement?      boolean
       |           +--ro disable-autoconfiguration?  boolean
       |           +--ro enable-onlink?              boolean
       +--rw neighbors
       |  +--rw neighbor* [ip]
       |     +--rw ip        -> ../config/ip
       |     +--rw config
       |     |  +--rw ip?                  openconfig-inet-types:ipv6-address
       |     |  +--rw link-layer-address   openconfig-yang-types:phys-address
       |     +--ro state
       |        +--ro ip?                  openconfig-inet-types:ipv6-address
       |        +--ro link-layer-address   openconfig-yang-types:phys-address
       |        +--ro origin?              neighbor-origin
       |        +--ro is-router?           boolean
       |        +--ro neighbor-state?      enumeration
       +--rw unnumbered
       |  +--rw config
       |  |  +--rw enabled?   boolean
       |  +--ro state
       |  |  +--ro enabled?   boolean
       |  +--rw interface-ref
       |     +--rw config
       |     |  +--rw interface?     -> /openconfig-interfaces:interfaces/interface/name
       |     |  +--rw subinterface?   -> /openconfig-interfaces:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
       |     +--ro state
       |       +--ro interface?     -> /openconfig-interfaces:interfaces/interface/name
```

```
      |       +--ro subinterface?   -> /openconfig-interfaces:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
      +--rw config
      |  +--rw enabled?                     boolean
      |  +--rw mtu?                         uint32
      |  +--rw dup-addr-detect-transmits?   uint32
      |  +--rw dhcp-client?                 boolean
      +--ro state
         +--ro enabled?                     boolean
         +--ro mtu?                         uint32
         +--ro dup-addr-detect-transmits?   uint32
         +--ro dhcp-client?                 boolean
         +--ro counters
            +--ro in-pkts?               openconfig-yang-types:counter64
            +--ro in-octets?             openconfig-yang-types:counter64
            +--ro in-multicast-pkts?     openconfig-yang-types:counter64
            +--ro in-multicast-octets?   openconfig-yang-types:counter64
            +--ro in-error-pkts?         openconfig-yang-types:counter64
            +--ro in-forwarded-pkts?     openconfig-yang-types:counter64
            +--ro in-forwarded-octets?   openconfig-yang-types:counter64
            +--ro in-discarded-pkts?     openconfig-yang-types:counter64
            +--ro out-pkts?              openconfig-yang-types:counter64
            +--ro out-octets?            openconfig-yang-types:counter64
            +--ro out-multicast-pkts?    openconfig-yang-types:counter64
            +--ro out-multicast-octets?  openconfig-yang-types:counter64
            +--ro out-error-pkts?        openconfig-yang-types:counter64
            +--ro out-forwarded-pkts?    openconfig-yang-types:counter64
            +--ro out-forwarded-octets?  openconfig-yang-types:counter64
            +--ro out-discarded-pkts?    openconfig-yang-types:counter64
```

openconfig-interfaces

```
  +--rw interfaces
     +--rw interface* [name]
        +--rw name                   -> ../config/name
        +--rw config
        |  +--rw name?           string
        |  +--rw type            identityref
        |  +--rw mtu?            uint16
        |  +--rw description?    string
        |  +--rw enabled?        boolean
        |  +--rw openconfig-vlan:tpid?   identityref
        +--ro state
        |  +--ro name?           string
        |  +--ro type            identityref
        |  +--ro mtu?            uint16
        |  +--ro description?    string
        |  +--ro enabled?        boolean
        |  +--ro ifindex?        uint32
        |  +--ro admin-status    enumeration
```

```
|  +--ro oper-status     enumeration
|  +--ro last-change?    openconfig-types:timeticks64
|  +--ro logical?        boolean
|  +--ro counters
|  |  +--ro in-octets?            openconfig-yang-types:counter64
|  |  +--ro in-pkts?              openconfig-yang-types:counter64
|  |  +--ro in-unicast-pkts?      openconfig-yang-types:counter64
|  |  +--ro in-broadcast-pkts?    openconfig-yang-types:counter64
|  |  +--ro in-multicast-pkts?    openconfig-yang-types:counter64
|  |  +--ro in-errors?            openconfig-yang-types:counter64
|  |  +--ro in-discards?          openconfig-yang-types:counter64
|  |  +--ro out-octets?           openconfig-yang-types:counter64
|  |  +--ro out-pkts?             openconfig-yang-types:counter64
|  |  +--ro out-unicast-pkts?     openconfig-yang-types:counter64
|  |  +--ro out-broadcast-pkts?   openconfig-yang-types:counter64
|  |  +--ro out-multicast-pkts?   openconfig-yang-types:counter64
|  |  +--ro out-discards?         openconfig-yang-types:counter64
|  |  +--ro out-errors?           openconfig-yang-types:counter64
|  |  +--ro last-clear?           openconfig-types:timeticks64
|  |  +--ro in-fcs-errors?        openconfig-yang-types:counter64
|  +--ro openconfig-vlan:tpid?   identityref
+--rw subinterfaces
|  +--rw subinterface* [index]
|     +--rw index           -> ../config/index
|     +--rw config
|     |  +--rw index?         uint32
|     |  +--rw description?   string
|     |  +--rw enabled?       boolean
|     +--ro state
|     |  +--ro index?         uint32
|     |  +--ro description?   string
|     |  +--ro enabled?       boolean
|     |  +--ro name?          string
|     |  +--ro ifindex?       uint32
|     |  +--ro oper-status    enumeration
|     |  +--ro last-change?   openconfig-types:timeticks64
|     |  +--ro logical?       boolean
|     |  +--ro counters
|     |     +--ro in-octets?           openconfig-yang-types:counter64
|     |     +--ro in-pkts?             openconfig-yang-types:counter64
|     |     +--ro in-unicast-pkts?     openconfig-yang-types:counter64
|     |     +--ro in-broadcast-pkts?   openconfig-yang-types:counter64
|     |     +--ro in-multicast-pkts?   openconfig-yang-types:counter64
|     |     +--ro in-errors?           openconfig-yang-types:counter64
|     |     +--ro in-discards?         openconfig-yang-types:counter64
|     |     +--ro out-octets?          openconfig-yang-types:counter64
|     |     +--ro out-pkts?            openconfig-yang-types:counter64
|     |     +--ro out-unicast-pkts?    openconfig-yang-types:counter64
|     |     +--ro out-broadcast-pkts?  openconfig-yang-types:counter64
|     |     +--ro out-multicast-pkts?  openconfig-yang-types:counter64
```

```
        |     |     +--ro out-discards?         openconfig-yang-types:counter64
        |     |     +--ro out-errors?           openconfig-yang-types:counter64
        |     |     +--ro last-clear?           openconfig-types:timeticks64
        |     |     x--ro in-fcs-errors?        openconfig-yang-types:counter64
        |     +--rw openconfig-vlan:vlan
        |     |  +--rw openconfig-vlan:match
        |     |  |  +--rw openconfig-vlan:single-tagged-list
        |     |  |  |  +--rw openconfig-vlan:config
        |     |  |  |  |  +--rw openconfig-vlan:vlan-ids*   openconfig-vlan-types:vlan-id
        |     |  |  |  +--ro openconfig-vlan:state
        |     |  |  |     +--ro openconfig-vlan:vlan-ids*   openconfig-vlan-types:vlan-id
        |     |  |  +--rw openconfig-vlan:single-tagged-range
        |     |  |  |  +--rw openconfig-vlan:config
        |     |  |  |  |  +--rw openconfig-vlan:low-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  |  |  +--rw openconfig-vlan:high-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  |  +--ro openconfig-vlan:state
        |     |  |  |     +--ro openconfig-vlan:low-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  |     +--ro openconfig-vlan:high-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  +--rw openconfig-vlan:double-tagged
        |     |  |  |  +--rw openconfig-vlan:config
        |     |  |  |  |  +--rw openconfig-vlan:inner-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  |  |  +--rw openconfig-vlan:outer-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  |  +--ro openconfig-vlan:state
        |     |  |  |     +--ro openconfig-vlan:inner-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  |     +--ro openconfig-vlan:outer-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  +--rw openconfig-vlan:double-tagged-outer-list
        |     |  |  |  +--rw openconfig-vlan:config
        |     |  |  |  |  +--rw openconfig-vlan:outer-vlan-ids*   openconfig-vlan-
types:vlan-id
        |     |  |  |  +--ro openconfig-vlan:state
        |     |  |  |     +--ro openconfig-vlan:outer-vlan-ids*   openconfig-vlan-
types:vlan-id
        |     |  |  +--rw openconfig-vlan:double-tagged-outer-range
        |     |  |  |  +--rw openconfig-vlan:config
        |     |  |  |  |  +--rw openconfig-vlan:outer-low-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  |  |  +--rw openconfig-vlan:outer-high-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  |  +--ro openconfig-vlan:state
        |     |  |  |     +--ro openconfig-vlan:outer-low-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  |     +--ro openconfig-vlan:outer-high-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |  +--rw openconfig-vlan:double-tagged-inner-outer-range
        |     |  |     +--rw openconfig-vlan:config
```

```
        |     |  |     |  +--rw openconfig-vlan:inner-low-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |     |  +--rw openconfig-vlan:inner-high-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |     |  +--rw openconfig-vlan:outer-low-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |     |  +--rw openconfig-vlan:outer-high-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |     +--ro openconfig-vlan:state
        |     |  |        +--ro openconfig-vlan:inner-low-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |        +--ro openconfig-vlan:inner-high-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |        +--ro openconfig-vlan:outer-low-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  |        +--ro openconfig-vlan:outer-high-vlan-id?   openconfig-vlan-
types:vlan-id
        |     |  +--rw openconfig-vlan:ingress-mapping
        |     |     +--rw openconfig-vlan:config
        |     |     |  +--rw openconfig-vlan:vlan-stack-action?   openconfig-vlan-
types:vlan-stack-action
        |     |     |  +--rw openconfig-vlan:vlan-id?     openconfig-vlan-types:vlan-id
        |     |     |  +--rw openconfig-vlan:tpid?        identityref
        |     |     +--ro openconfig-vlan:state
        |     |        +--ro openconfig-vlan:vlan-stack-action?   openconfig-vlan-
types:vlan-stack-action
        |     |        +--ro openconfig-vlan:vlan-id?     openconfig-vlan-types:vlan-id
        |     |        +--ro openconfig-vlan:tpid?        identityref
        |     +--rw openconfig-if-ip:ipv4
        |     |  +--rw openconfig-if-ip:addresses
        |     |  |  +--rw openconfig-if-ip:address* [ip]
        |     |  |     +--rw openconfig-if-ip:ip   -> ../config/ip
        |     |  |     +--rw openconfig-if-ip:config
        |     |  |     |  +--rw openconfig-if-ip:ip?   openconfig-inet-types:ipv4-address
        |     |  |     |  +--rw openconfig-if-ip:prefix-length?   uint8
        |     |  |     |  +--rw openconfig-if-ip:type?   ipv4-address-type
        |     |  |     +--ro openconfig-if-ip:state
        |     |  |        +--ro openconfig-if-ip:ip?   openconfig-inet-types:ipv4-address
        |     |  |        +--ro openconfig-if-ip:prefix-length?   uint8
        |     |  |        +--ro openconfig-if-ip:type?   ipv4-address-type
        |     |  +--rw openconfig-if-ip:config
        |     |  |  +--rw openconfig-if-ip:dhcp-client?   boolean
        |     |  +--ro openconfig-if-ip:state
        |     |     +--ro openconfig-if-ip:dhcp-client?   boolean
        |     +--rw openconfig-if-ip:ipv6
        |        +--rw openconfig-if-ip:addresses
        |        |  +--rw openconfig-if-ip:address* [ip]
        |        |     +--rw openconfig-if-ip:ip   -> ../config/ip
        |        |     +--rw openconfig-if-ip:config
        |        |     |  +--rw openconfig-if-ip:ip?   openconfig-inet-types:ipv6-address
        |        |     |  +--rw openconfig-if-ip:prefix-length   uint8
        |        |     +--ro openconfig-if-ip:state
        |        |        +--ro openconfig-if-ip:ip?   openconfig-inet-types:ipv6-address
```

```
        |        |        +--ro openconfig-if-ip:prefix-length   uint8
        |        +--rw openconfig-if-ip:config
        |        |  +--rw openconfig-if-ip:dhcp-client?   boolean
        |        +--ro openconfig-if-ip:state
        |           +--ro openconfig-if-ip:dhcp-client?   boolean
        +--rw openconfig-if-ethernet:ethernet
        |  +--rw openconfig-if-ethernet:config
        |  |  +--rw openconfig-if-ethernet:mac-address?   openconfig-yang-types:mac-
address
        |  |  +--rw openconfig-if-ethernet:auto-negotiate?   boolean
        |  |  +--rw openconfig-if-ethernet:duplex-mode?   enumeration
        |  |  +--rw openconfig-if-ethernet:port-speed?    identityref
        |  |  +--rw openconfig-if-aggregate:aggregate-id?   -> /openconfig-
interfaces:interfaces/interface/name
        |  |  +--rw ipi-oc-if-deviations:lacp-mode?      openconfig-lacp:lacp-activity-
type
        |  |  x--rw ipi-oc-if-deviations:load-interval?   uint16
        |  +--ro openconfig-if-ethernet:state
        |  |  +--ro openconfig-if-ethernet:mac-address?   openconfig-yang-types:mac-
address
        |  |  +--ro openconfig-if-ethernet:auto-negotiate?   boolean
        |  |  +--ro openconfig-if-ethernet:duplex-mode?   enumeration
        |  |  +--ro openconfig-if-ethernet:port-speed?    identityref
        |  |  +--ro openconfig-if-ethernet:hw-mac-address?   string
        |  |  +--ro openconfig-if-ethernet:negotiated-duplex-mode?   enumeration
        |  |  +--ro openconfig-if-ethernet:negotiated-port-speed?   identityref
        |  |  +--ro openconfig-if-ethernet:counters
        |  |  |  +--ro openconfig-if-ethernet:in-oversize-frames?   openconfig-yang-
types:counter64
        |  |  |  +--ro openconfig-if-ethernet:in-jabber-frames?   openconfig-yang-
types:counter64
        |  |  |  +--ro openconfig-if-ethernet:in-fragment-frames?   openconfig-yang-
types:counter64
        |  |  |  +--ro openconfig-if-ethernet:in-crc-errors?   openconfig-yang-
types:counter64
        |  |  +--ro openconfig-if-aggregate:aggregate-id?   -> /openconfig-
interfaces:interfaces/interface/name
        |  |  +--ro ipi-oc-if-deviations:lacp-mode?      openconfig-lacp:lacp-activity-
type
        |  |  x--ro ipi-oc-if-deviations:load-interval?   uint16
        |  +--rw openconfig-vlan:switched-vlan
        |     +--rw openconfig-vlan:config
        |     |  +--rw openconfig-vlan:interface-mode?   openconfig-vlan-types:vlan-
mode-type
        |     |  +--rw openconfig-vlan:native-vlan?   openconfig-vlan-types:vlan-id
        |     |  +--rw openconfig-vlan:access-vlan?   openconfig-vlan-types:vlan-id
        |     |  +--rw openconfig-vlan:trunk-vlans*   union
        |     +--ro openconfig-vlan:state
        |        +--ro openconfig-vlan:interface-mode?   openconfig-vlan-types:vlan-mode-
type
        |        +--ro openconfig-vlan:native-vlan?   openconfig-vlan-types:vlan-id
        |        +--ro openconfig-vlan:access-vlan?   openconfig-vlan-types:vlan-id
        |        +--ro openconfig-vlan:trunk-vlans*   union
```

```
        +--rw openconfig-if-aggregate:aggregation
        |  +--rw openconfig-if-aggregate:config
        |  |  +--rw openconfig-if-aggregate:lag-type?   aggregation-type
        |  |  +--rw openconfig-if-aggregate:min-links?   uint8
        |  |  +--rw ipi-oc-if-deviations:mlag-id?   uint16
        |  +--ro openconfig-if-aggregate:state
        |  |  +--ro openconfig-if-aggregate:lag-type?   aggregation-type
        |  |  +--ro openconfig-if-aggregate:min-links?   uint16
        |  |  +--ro ipi-oc-if-deviations:mlag-id?   uint16
        |  +--rw openconfig-vlan:switched-vlan
        |     +--rw openconfig-vlan:config
        |     |  +--rw openconfig-vlan:interface-mode?   openconfig-vlan-types:vlan-
mode-type
        |     |  +--rw openconfig-vlan:native-vlan?   openconfig-vlan-types:vlan-id
        |     |  +--rw openconfig-vlan:access-vlan?   openconfig-vlan-types:vlan-id
        |     |  +--rw openconfig-vlan:trunk-vlans*   union
        |     +--ro openconfig-vlan:state
        |        +--ro openconfig-vlan:interface-mode?   openconfig-vlan-types:vlan-mode-
type
        |        +--ro openconfig-vlan:native-vlan?   openconfig-vlan-types:vlan-id
        |        +--ro openconfig-vlan:access-vlan?   openconfig-vlan-types:vlan-id
        |        +--ro openconfig-vlan:trunk-vlans*   union
        +--rw openconfig-if-tunnel:tunnel
        |  +--rw openconfig-if-tunnel:config
        |  |  +--rw openconfig-if-tunnel:src?   openconfig-inet-types:ip-address
        |  |  +--rw openconfig-if-tunnel:dst?   openconfig-inet-types:ip-address
        |  |  +--rw openconfig-if-tunnel:ttl?   uint8
        |  +--ro openconfig-if-tunnel:state
        |  |  +--ro openconfig-if-tunnel:src?   openconfig-inet-types:ip-address
        |  |  +--ro openconfig-if-tunnel:dst?   openconfig-inet-types:ip-address
        |  |  +--ro openconfig-if-tunnel:ttl?   uint8
        |  +--rw openconfig-if-tunnel:ipv4
        |  |  +--rw openconfig-if-tunnel:addresses
        |  |  |  +--rw openconfig-if-tunnel:address* [ip]
        |  |  |     +--rw openconfig-if-tunnel:ip   -> ../config/ip
        |  |  |     +--rw openconfig-if-tunnel:config
        |  |  |     |  +--rw openconfig-if-tunnel:ip?   openconfig-inet-types:ipv4-
address
        |  |  |     |  +--rw openconfig-if-tunnel:prefix-length?   uint8
        |  |  |     |  +--rw openconfig-if-tunnel:type?   ipv4-address-type
        |  |  |     +--ro openconfig-if-tunnel:state
        |  |  |        +--ro openconfig-if-tunnel:ip?   openconfig-inet-types:ipv4-
address
        |  |  |        +--ro openconfig-if-tunnel:prefix-length?   uint8
        |  |  |        +--ro openconfig-if-tunnel:type?   ipv4-address-type
        |  |  +--rw openconfig-if-tunnel:unnumbered
        |  |     +--rw openconfig-if-tunnel:config
        |  |     |  +--rw openconfig-if-tunnel:enabled?   boolean
        |  |     +--ro openconfig-if-tunnel:state
        |  |     |  +--ro openconfig-if-tunnel:enabled?   boolean
        |  |     +--rw openconfig-if-tunnel:interface-ref
```

```
        |  |        +--rw openconfig-if-tunnel:config
        |  |        |  +--rw openconfig-if-tunnel:interface?   -> /openconfig-
interfaces:interfaces/interface/name
        |  |        |  +--rw openconfig-if-tunnel:subinterface?   -> /openconfig-
interfaces:interfaces/interface[oc-if:name=current()/../interface]/subinterfaces/
subinterface/index
        |  |        +--ro openconfig-if-tunnel:state
        |  |           +--ro openconfig-if-tunnel:interface?   -> /openconfig-
interfaces:interfaces/interface/name
        |  |           +--ro openconfig-if-tunnel:subinterface?   -> /openconfig-
interfaces:interfaces/interface[oc-if:name=current()/../interface]/subinterfaces/
subinterface/index
        |  +--rw openconfig-if-tunnel:ipv6
        |     +--rw openconfig-if-tunnel:addresses
        |        +--rw openconfig-if-tunnel:address* [ip]
        |           +--rw openconfig-if-tunnel:ip   -> ../config/ip
        |           +--rw openconfig-if-tunnel:config
        |           |  +--rw openconfig-if-tunnel:ip?   openconfig-inet-types:ipv6-
address
        |           |  +--rw openconfig-if-tunnel:prefix-length   uint8
        |           +--ro openconfig-if-tunnel:state
        |              +--ro openconfig-if-tunnel:ip?   openconfig-inet-types:ipv6-
address
        |              +--ro openconfig-if-tunnel:prefix-length   uint8
        +--rw openconfig-if-rates:rates
           +--rw openconfig-if-rates:config
           |  +--rw openconfig-if-rates:load-interval?   uint16
           +--ro openconfig-if-rates:state
              +--ro openconfig-if-rates:load-interval?   uint16
              +--ro openconfig-if-rates:out-bits-rate?   uint64
              +--ro openconfig-if-rates:in-bits-rate?   uint64
              +--ro openconfig-if-rates:out-pkts-rate?   uint64
              +--ro openconfig-if-rates:in-pkts-rate?   uint64
```

openconfig-lacp

```
  +--rw lacp
     +--rw config
     |  +--rw system-priority?   uint16
     +--ro state
        +--ro system-priority?   uint16
```

openconfig-lldp

```
  +--rw lldp
     +--rw config
     |  +--rw enabled?                      boolean
     |  +--rw suppress-tlv-advertisement*   identityref
     |  +--rw system-name?                  string
     |  +--rw chassis-id?                   string
```

```
|  +--rw chassis-id-type?              openconfig-lldp-types:chassis-id-type
+--ro state
|  +--ro enabled?                     boolean
|  +--ro suppress-tlv-advertisement*  identityref
|  +--ro system-name?                 string
|  +--ro chassis-id?                  string
|  +--ro chassis-id-type?             openconfig-lldp-types:chassis-id-type
+--rw interfaces
   +--rw interface* [name]
      +--rw name         -> ../config/name
      +--rw config
      |  +--rw name?      openconfig-interfaces:base-interface-ref
      |  +--rw enabled?   boolean
      +--ro state
      |  +--ro name?       openconfig-interfaces:base-interface-ref
      |  +--ro enabled?    boolean
      |  +--ro counters
      |     +--ro frame-out?    ietf-yang-types:counter64
      |     +--ro last-clear?   ietf-yang-types:date-and-time
      +--ro neighbors
         +--ro neighbor* [id]
            +--ro id              -> ../state/id
            +--ro state
            |  +--ro system-name?               string
            |  +--ro system-description?        string
            |  +--ro chassis-id?                string
             |  +--ro chassis-id-type?          openconfig-lldp-types:chassis-id-type
            |  +--ro id?                        string
            |  +--ro ttl?                       uint16
            |  +--ro port-id?                   string
            |  +--ro port-id-type?              openconfig-lldp-types:port-id-type
            |  +--ro port-description?          string
            |  +--ro management-address?        string
            |  +--ro management-address-type?   string
            +--ro custom-tlvs
            |  +--ro tlv* [type oui oui-subtype]
            |     +--ro type           -> ../state/type
            |     +--ro oui            -> ../state/oui
            |     +--ro oui-subtype    -> ../state/oui-subtype
            |     +--ro config
            |     +--ro state
            |        +--ro type?          int32
            |        +--ro oui?           string
            |        +--ro oui-subtype?   string
            |        +--ro value?         binary
            +--ro capabilities
               +--ro capability* [name]
                  +--ro name      -> ../state/name
                  +--ro config
                  +--ro state
```

```
                        +--ro name?      identityref
                        +--ro enabled?   boolean
```

openconfig-network-instance

```
  +--rw network-instances
     +--rw network-instance* [name]
        +--rw name                        -> ../config/name
        +--rw config
        |  +--rw name?                                    string
        |  +--rw type                                     identityref
        |  +--rw description?                             string
        |  +--rw router-id?                               openconfig-yang-types:dotted-quad
        |  +--rw route-distinguisher?                     openconfig-network-instance-
types:route-distinguisher
        |  +--rw fallback-network-instance?               network-instance-ref
        |  +--rw ipi-oc-ni-augments:bridge-protocol?      enumeration
        +--ro state
        |  +--ro name?                                    string
        |  +--ro type                                     identityref
        |  +--ro description?                             string
        |  +--ro router-id?                               openconfig-yang-types:dotted-quad
        |  +--ro route-distinguisher?                     openconfig-network-instance-
types:route-distinguisher
        |  +--ro ipi-oc-ni-augments:bridge-protocol?      enumeration
        +--rw fdb
        |  +--rw config
        |  |  +--rw mac-learning?      boolean
        |  |  +--rw maximum-entries?   uint16
        |  +--ro state
        |  |  +--ro mac-learning?      boolean
        |  |  +--ro maximum-entries?   uint16
        |  +--rw mac-table
        |     +--rw entries
        |        +--rw entry* [mac-address vlan]
        |           +--rw mac-address    -> ../config/mac-address
        |           +--rw vlan           -> ../config/vlan
        |           +--rw config
        |              +--rw mac-address?   openconfig-yang-types:mac-address
        |              +--rw vlan?          -> ../../../../../../vlans/vlan/config/vlan-id
        +--rw evpn
        |  +--rw evpn-instances
        |     +--rw evpn-instance* [evi]
        |        +--rw evi       -> ../config/evi
        |        +--rw config
        |        |  +--rw evi?                   string
        |        |  +--rw encapsulation-type?   identityref
        |        +--ro state
        |           +--ro evi?                    string
        |           +--ro encapsulation-type?     identityref
```

```
        |           +--ro service-type?           identityref
        |           +--ro multicast-group?        openconfig-inet-types:ip-address
        |           +--ro multicast-mask?         openconfig-inet-types:ip-address
        |           +--ro replication-mode?       enumeration
        |           +--ro control-word-enabled?   boolean
        +--rw encapsulation
        |  +--rw config
        |  |  +--rw encapsulation-type?      identityref
        |  |  +--rw label-allocation-mode?   identityref
        |  +--ro state
        |     +--ro encapsulation-type?      identityref
        |     +--ro label-allocation-mode?   identityref
        +--rw inter-instance-policies
        |  +--rw apply-policy
        |  |  +--rw config
        |  |  |  +--rw import-policy*   -> /openconfig-routing-policy:routing-policy/
policy-definitions/policy-definition/name
        |  |  |  +--rw export-policy*   -> /openconfig-routing-policy:routing-policy/
policy-definitions/policy-definition/name
        |  |  +--ro state
        |  |     +--ro import-policy*   -> /openconfig-routing-policy:routing-policy/
policy-definitions/policy-definition/name
        |  |     +--ro export-policy*   -> /openconfig-routing-policy:routing-policy/
policy-definitions/policy-definition/name
        |  +--rw import-export-policy
        |     +--rw config
        |     |  +--rw export-route-target*   union
        |     |  +--rw import-route-target*   union
        |     +--ro state
        |        +--ro export-route-target*   union
        |        +--ro import-route-target*   union
        +--rw table-connections
        |  +--rw table-connection* [src-protocol dst-protocol address-family]
        |     +--rw src-protocol      -> ../config/src-protocol
        |     +--rw dst-protocol      -> ../config/dst-protocol
        |     +--rw address-family    -> ../config/address-family
        |     +--rw config
        |     |  +--rw src-protocol?                      -> ../../../../tables/table/
config/protocol
        |     |  +--rw address-family?                    -> ../../../../tables/
table[protocol=current()/../src-protocol]/config/address-family
        |     |  +--rw dst-protocol?                      -> ../../../../tables/table/
config/protocol
        |     |  +--rw import-policy*                     -> /openconfig-routing-
policy:routing-policy/policy-definitions/policy-definition/name
        |     |  +--rw default-import-policy?             default-policy-type
        |     |  +--rw ipi-oc-ni-augments:dst-instance?   string
        |     +--ro state
        |        +--ro src-protocol?                -> ../../../../tables/table/config/
protocol
        |        +--ro address-family?               -> ../../../../tables/
table[protocol=current()/../src-protocol]/config/address-family
```

```
        |        +--ro dst-protocol?                -> ../../../../tables/table/config/
protocol
        |        +--ro disable-metric-propagation?   boolean
        |        +--ro import-policy*                -> /openconfig-routing-
policy:routing-policy/policy-definitions/policy-definition/name
        |        +--ro default-import-policy?        default-policy-type
        +--rw interfaces
        |  +--rw interface* [id]
        |     +--rw id        -> ../config/id
        |     +--rw config
        |     |  +--rw id?             string
        |     |  +--rw interface?      -> /openconfig-interfaces:interfaces/interface/
name
       |     |  +--rw subinterface?   -> /openconfig-interfaces:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
        |     +--ro state
        |        +--ro id?             openconfig-interfaces:interface-id
        |        +--ro interface?      -> /openconfig-interfaces:interfaces/interface/
name
       |        +--ro subinterface?   -> /openconfig-interfaces:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
        +--rw tables
        |  +--rw table* [protocol address-family]
        |     +--rw protocol          -> ../config/protocol
        |     +--rw address-family    -> ../config/address-family
        |     +--rw config
        |     |  +--rw protocol?         -> ../../../../protocols/protocol/config/
identifier
        |     |  +--rw address-family?   identityref
        |     +--ro state
        |        +--ro protocol?         -> ../../../../protocols/protocol/config/
identifier
        |        +--ro address-family?   identityref
        +--rw connection-points
        |  +--rw connection-point* [connection-point-id]
        |     +--rw connection-point-id    -> ../config/connection-point-id
        |     +--rw config
        |     |  +--rw connection-point-id?   string
        |     +--ro state
        |     |  +--ro connection-point-id?   string
        |     +--rw endpoints
        |        +--rw endpoint* [endpoint-id]
        |           +--rw endpoint-id    -> ../config/endpoint-id
        |           +--rw config
        |           |  +--rw endpoint-id?   string
        |           |  +--rw precedence?    uint16
        |           |  +--rw type?          identityref
        |           +--ro state
        |           |  +--ro endpoint-id?   string
        |           |  +--ro precedence?    uint16
        |           +--rw local
        |           |  +--rw config
```

```
        |           |  |  +--rw interface?      -> /openconfig-interfaces:interfaces/
interface/name
        |           |  |  +--rw subinterface?   -> /openconfig-interfaces:interfaces/
interface[oc-if:name=current()/../interface]/subinterfaces/subinterface/index
        |           |  +--ro state
        |           |     +--ro interface?                -> /openconfig-
interfaces:interfaces/interface/name
        |           |     +--ro subinterface?             -> /openconfig-
interfaces:interfaces/interface[oc-if:name=current()/../interface]/subinterfaces/
subinterface/index
        |           |     +--ro site-id?                  uint16
        |           |     +--ro site-label-block-offset?  uint16
        |           |     +--ro site-label-block-size?    uint16
        |           +--rw remote
        |           |  +--rw config
        |           |  |  +--rw remote-system?               openconfig-inet-types:ip-
address
        |           |  |  +--rw virtual-circuit-identifier?  uint32
        |           |  +--ro state
        |           |     +--ro remote-system?               openconfig-inet-types:ip-
address
        |           |     +--ro virtual-circuit-identifier?  uint32
        |           +--rw vxlan
        |              +--ro endpoint-peers
        |                 +--ro endpoint-peer* [peer-address]
        |                    +--ro peer-address    -> ../state/peer-address
        |                    +--ro state
        |                       +--ro peer-address?         openconfig-inet-types:ip-
address
        |                       +--ro peer-state?           enumeration
        |                       +--ro uptime?               openconfig-types:timeticks64
        |                       x--ro control-plane-vnis*   oc-evpn-types:vni-id
        |                       x--ro router-mac?           openconfig-yang-types:mac-
address
        +--rw mpls
        |  +--rw global
        |  |  +--rw config
        |  |  |  +--rw pw-encapsulation?   identityref
        |  |  +--ro state
        |  |  |  +--ro pw-encapsulation?   identityref
        |  |  +--rw interface-attributes
        |  |  |  +--rw interface* [interface-id]
        |  |  |     +--rw interface-id     -> ../config/interface-id
        |  |  |     +--rw config
        |  |  |     |  +--rw interface-id?   openconfig-interfaces:interface-id
        |  |  |     |  +--rw mpls-enabled?   boolean
        |  |  |     +--rw interface-ref
        |  |  |        +--rw config
        |  |  |           +--rw interface?      -> /openconfig-interfaces:interfaces/
interface/name
        |  |  |           +--rw subinterface?   -> /openconfig-interfaces:interfaces/
interface[oc-if:name=current()/../interface]/subinterfaces/subinterface/index
        |  |  +--rw reserved-label-blocks
```

```
        |  |     +--rw reserved-label-block* [local-id]
        |  |        +--rw local-id    -> ../config/local-id
        |  |        +--rw config
        |  |           +--rw local-id?   string
        |  +--rw te-global-attributes
        |  |  +--rw srlgs
        |  |  |  +--rw srlg* [name]
        |  |  |     +--rw name      -> ../config/name
        |  |  |     +--rw config
        |  |  |     |  +--rw name?   string
        |  |  |     +--ro state
        |  |  |        +--ro name?   string
        |  |  +--rw mpls-admin-groups
        |  |  |  +--rw admin-group* [admin-group-name]
        |  |  |     +--rw admin-group-name    -> ../config/admin-group-name
        |  |  |     +--rw config
        |  |  |     |  +--rw admin-group-name?   string
        |  |  |     |  +--rw bit-position?       uint32
        |  |  |     +--ro state
        |  |  |        +--ro admin-group-name?   string
        |  |  |        +--ro bit-position?       uint32
        |  |  +--rw te-lsp-timers
        |  |     +--rw config
        |  |     |  +--rw reoptimize-timer?   uint16
        |  |     +--ro state
        |  |        +--ro reoptimize-timer?   uint16
        |  +--rw te-interface-attributes
        |  |  +--rw interface* [interface-id]
        |  |     +--rw interface-id     -> ../config/interface-id
        |  |     +--rw config
        |  |     |  +--rw interface-id?      openconfig-interfaces:interface-id
        |  |     |  +--rw srlg-membership*   -> ../../../../te-global-attributes/srlgs/
srlg/name
        |  |     |  +--rw admin-group*       string
        |  |     +--ro state
        |  |     |  +--ro interface-id?      openconfig-interfaces:interface-id
        |  |     |  +--ro srlg-membership*   -> ../../../../te-global-attributes/srlgs/
srlg/name
        |  |     |  +--ro admin-group*       string
        |  |     +--rw interface-ref
        |  |        +--rw config
        |  |        |  +--rw interface?      -> /openconfig-interfaces:interfaces/
interface/name
        |  |        |  +--rw subinterface?   -> /openconfig-interfaces:interfaces/
interface[oc-if:name=current()/../interface]/subinterfaces/subinterface/index
        |  |        +--ro state
        |  |           +--ro interface?      -> /openconfig-interfaces:interfaces/
interface/name
        |  |           +--ro subinterface?   -> /openconfig-interfaces:interfaces/
interface[oc-if:name=current()/../interface]/subinterfaces/subinterface/index
        |  +--rw signaling-protocols
        |  |  +--rw rsvp-te
```

```
|  |  |  +--rw sessions
|  |  |  |  +--ro session* [local-index]
|  |  |  |     +--ro local-index    -> ../state/local-index
|  |  |  |     +--ro state
|  |  |  |        +--ro local-index?           uint64
|  |  |  |        +--ro source-address?        inet:ip-address
|  |  |  |        +--ro destination-address?   inet:ip-address
|  |  |  |        +--ro tunnel-id?             uint16
|  |  |  |        +--ro lsp-id?                uint16
|  |  |  |        +--ro session-name?          string
|  |  |  |        +--ro type?                  identityref
|  |  |  |        +--ro label-in?              oc-mplst:mpls-label
|  |  |  |        +--ro label-out?             oc-mplst:mpls-label
|  |  |  +--rw neighbors
|  |  |  |  +--ro neighbor* [address]
|  |  |  |     +--ro address    -> ../state/address
|  |  |  |     +--ro state
|  |  |  |        +--ro address?             inet:ip-address
|  |  |  |        +--ro neighbor-status?     enumeration
|  |  |  |        +--ro refresh-reduction?   boolean
|  |  |  +--rw global
|  |  |  |  +--rw graceful-restart
|  |  |  |  |  +--rw config
|  |  |  |  |  |  +--rw enable?          boolean
|  |  |  |  |  |  +--rw restart-time?    uint32
|  |  |  |  |  |  +--rw recovery-time?   uint32
|  |  |  |  |  +--ro state
|  |  |  |  |     +--ro enable?          boolean
|  |  |  |  |     +--ro restart-time?    uint32
|  |  |  |  |     +--ro recovery-time?   uint32
|  |  |  |  +--rw hellos
|  |  |  |  |  +--rw config
|  |  |  |  |  |  +--rw hello-interval?   uint16
|  |  |  |  |  +--ro state
|  |  |  |  |     +--ro hello-interval?   uint16
|  |  |  |  +--ro state
|  |  |  |     +--ro counters
|  |  |  |        +--ro in-path-messages?                yang:counter64
|  |  |  |        +--ro in-path-error-messages?          yang:counter64
|  |  |  |        +--ro in-path-tear-messages?           yang:counter64
|  |  |  |        +--ro in-reservation-messages?         yang:counter64
|  |  |  |        +--ro in-reservation-error-messages?   yang:counter64
|  |  |  |        +--ro in-reservation-tear-messages?    yang:counter64
|  |  |  |        +--ro in-hello-messages?               yang:counter64
|  |  |  |        +--ro in-srefresh-messages?            yang:counter64
|  |  |  |        +--ro in-ack-messages?                 yang:counter64
|  |  |  |        +--ro out-path-messages?               yang:counter64
|  |  |  |        +--ro out-path-error-messages?         yang:counter64
|  |  |  |        +--ro out-path-tear-messages?          yang:counter64
|  |  |  |        +--ro out-reservation-messages?        yang:counter64
```

```
        |  |  |  |        +--ro out-reservation-error-messages?   yang:counter64
        |  |  |  |        +--ro out-reservation-tear-messages?    yang:counter64
        |  |  |  |        +--ro out-hello-messages?               yang:counter64
        |  |  |  |        +--ro out-srefresh-messages?            yang:counter64
        |  |  |  |        +--ro out-ack-messages?                 yang:counter64
        |  |  |  +--rw interface-attributes
        |  |  |  |  +--rw interface* [interface-id]
        |  |  |  |     +--rw interface-id     -> ../config/interface-id
        |  |  |  |     +--rw config
        |  |  |  |     |  +--rw interface-id?                 openconfig-
interfaces:interface-id
        |  |  |  |     |  +--rw ipi-oc-ni-augments:enabled?   boolean
        |  |  |  |     +--ro state
        |  |  |  |     |  +--ro interface-id?                 openconfig-
interfaces:interface-id
        |  |  |  |     |  +--ro ipi-oc-ni-augments:enabled?   boolean
        |  |  |  |     +--rw interface-ref
        |  |  |  |     |  +--rw config
        |  |  |  |     |  |  +--rw interface?     -> /openconfig-interfaces:interfaces/
interface/name
        |  |  |  |     |  |  +--rw subinterface?   -> /openconfig-interfaces:interfaces/
interface[oc-if:name=current()/../interface]/subinterfaces/subinterface/index
        |  |  |  |     |  +--ro state
        |  |  |  |     |     +--ro interface?     -> /openconfig-interfaces:interfaces/
interface/name
        |  |  |  |     |     +--ro subinterface?   -> /openconfig-interfaces:interfaces/
interface[oc-if:name=current()/../interface]/subinterfaces/subinterface/index
        |  |  |  |     +--rw hellos
        |  |  |  |        +--rw config
        |  |  |  |        |  +--rw hello-interval?   uint16
        |  |  |  |        +--ro state
        |  |  |  |           +--ro hello-interval?   uint16
        |  |  |  +--rw ipi-oc-ni-augments:config
        |  |  |  |  +--rw ipi-oc-ni-augments:enabled?   empty
        |  |  |  +--ro ipi-oc-ni-augments:state
        |  |  |     +--ro ipi-oc-ni-augments:enabled?   empty
        |  |  +--rw ldp
        |  |     +--rw global
        |  |     |  +--rw config
        |  |     |  |  +--rw lsr-id?   openconfig-inet-types:ipv4-address
        |  |     |  +--ro state
        |  |     |  |  +--ro lsr-id?   openconfig-inet-types:ipv4-address
        |  |     |  +--rw graceful-restart
        |  |     |  |  +--rw config
        |  |     |  |  |  +--rw reconnect-time?   uint16
        |  |     |  |  |  +--rw recovery-time?    uint16
        |  |     |  |  |  +--rw helper-enable?    boolean
        |  |     |  |  +--ro state
        |  |     |  |     +--ro reconnect-time?   uint16
        |  |     |  |     +--ro recovery-time?    uint16
        |  |     |  |     +--ro helper-enable?    boolean
        |  |     |  +--rw authentication
```

```
        |  |     |     +--rw config
        |  |     |     |  +--rw authentication-key?   openconfig-types:routing-password
        |  |     |     +--ro state
        |  |     |        +--ro authentication-key?   openconfig-types:routing-password
        |  |     +--rw interface-attributes
        |  |     |  +--rw config
        |  |     |  |  +--rw hello-holdtime?   uint16
        |  |     |  |  +--rw hello-interval?   uint16
        |  |     |  +--ro state
        |  |     |  |  +--ro hello-holdtime?   uint16
        |  |     |  |  +--ro hello-interval?   uint16
        |  |     |  +--rw interfaces
        |  |     |     +--rw interface* [interface-id]
        |  |     |        +--rw interface-id        -> ../config/interface-id
        |  |     |        +--rw config
        |  |     |        |  +--rw interface-id?     openconfig-interfaces:interface-id
        |  |     |        |  +--rw hello-holdtime?   uint16
        |  |     |        |  +--rw hello-interval?   uint16
        |  |     |        +--ro state
        |  |     |        |  +--ro interface-id?     openconfig-interfaces:interface-id
        |  |     |        |  +--ro hello-holdtime?   uint16
        |  |     |        |  +--ro hello-interval?   uint16
        |  |     |        +--rw interface-ref
        |  |     |        |  +--rw config
        |  |     |        |  |  +--rw interface?      -> /openconfig-
interfaces:interfaces/interface/name
        |  |     |        |  |  +--rw subinterface?   -> /openconfig-
interfaces:interfaces/interface[oc-if:name=current()/../interface]/subinterfaces/
subinterface/index
        |  |     |        |  +--ro state
        |  |     |        |     +--ro interface?      -> /openconfig-
interfaces:interfaces/interface/name
        |  |     |        |     +--ro subinterface?   -> /openconfig-
interfaces:interfaces/interface[oc-if:name=current()/../interface]/subinterfaces/
subinterface/index
        |  |     |        +--rw address-families
        |  |     |           +--rw address-family* [afi-name]
        |  |     |              +--rw afi-name    -> ../config/afi-name
        |  |     |              +--rw config
        |  |     |              |  +--rw afi-name?   oc-ldp:mpls-ldp-afi
        |  |     |              |  +--rw enabled?    boolean
        |  |     |              +--ro state
        |  |     |                 +--ro afi-name?   oc-ldp:mpls-ldp-afi
        |  |     |                 +--ro enabled?    boolean
        |  |     +--rw targeted
        |  |     |  +--rw config
        |  |     |  |  +--rw hello-holdtime?   uint16
        |  |     |  |  +--rw hello-interval?   uint16
        |  |     |  +--ro state
        |  |     |  |  +--ro hello-holdtime?   uint16
        |  |     |  |  +--ro hello-interval?   uint16
        |  |     |  +--rw address-families
```

```
        |  |     |     +--rw address-family* [afi-name]
        |  |     |        +--rw afi-name    -> ../config/afi-name
        |  |     |        +--rw config
        |  |     |        |  +--rw afi-name?   oc-ldp:mpls-ldp-afi
        |  |     |        +--ro state
        |  |     |        |  +--ro afi-name?   oc-ldp:mpls-ldp-afi
        |  |     |        +--rw targets
        |  |     |           +--rw target* [remote-address]
       |  |     |            +--rw remote-address    openconfig-inet-types:ipv4-address
        |  |     |              +--rw config
        |  |     |              |  +--rw remote-address?   openconfig-inet-types:ipv4-
address
        |  |     |              |  +--rw local-address?    openconfig-inet-types:ipv4-
address
        |  |     |              |  +--rw hello-holdtime?   uint16
        |  |     |              |  +--rw hello-interval?   uint16
        |  |     |              +--ro state
        |  |     |                 +--ro remote-address?   openconfig-inet-types:ipv4-
address
        |  |     |                 +--ro local-address?    openconfig-inet-types:ipv4-
address
        |  |     |                 +--ro hello-holdtime?   uint16
        |  |     |                 +--ro hello-interval?   uint16
        |  |     +--rw neighbors
        |  |     |  +--rw neighbor* [lsr-id label-space-id]
        |  |     |     +--rw lsr-id               openconfig-inet-types:ipv4-address
        |  |     |     +--rw label-space-id       -> ../config/label-space-id
        |  |     |     +--rw config
        |  |     |     |  +--rw lsr-id?           openconfig-inet-types:ipv4-address
        |  |     |     |  +--rw label-space-id?   uint16
        |  |     |     +--ro state
        |  |     |     |  +--ro lsr-id?                                openconfig-inet-
types:ipv4-address
        |  |     |     |  +--ro label-space-id?                        uint16
        |  |     |     |  +--ro session-state?                         enumeration
        |  |     |     |  +--ro negotiated-label-advertisement-mode?   label-
advertisement-mode
        |  |     |     +--ro hello-adjacencies
        |  |     |     |  +--ro hello-adjacency* [remote-address local-address]
        |  |     |     |     +--ro remote-address    openconfig-inet-types:ipv4-address
        |  |     |     |     +--ro local-address     openconfig-inet-types:ipv4-address
        |  |     |     |     +--ro state
       |  |     |     |     |  +--ro remote-address?   openconfig-inet-types:ipv4-address
       |  |     |     |     |  +--ro local-address?    openconfig-inet-types:ipv4-address
        |  |     |     |     |  +--ro adjacency-type?   oc-ldp:mpls-ldp-adjacency-type
        |  |     |     |     +--ro interface-ref
        |  |     |     |        +--ro state
        |  |     |     |           +--ro interface?      -> /openconfig-
interfaces:interfaces/interface/name
        |  |     |     |           +--ro subinterface?   -> /openconfig-
interfaces:interfaces/interface[oc-if:name=current()/../interface]/subinterfaces/
subinterface/index
```

```
        |  |     |     +--rw authentication
        |  |     |        +--rw config
        |  |     |        |  +--rw authentication-key?   openconfig-types:routing-
password
        |  |     |        +--ro state
       |  |     |          +--ro authentication-key?   openconfig-types:routing-password
        |  |     +--rw ipi-oc-ni-augments:config
        |  |     |  +--rw ipi-oc-ni-augments:enabled?   boolean
        |  |     +--ro ipi-oc-ni-augments:state
        |  |        +--ro ipi-oc-ni-augments:enabled?   boolean
        |  +--rw lsps
        |     +--rw constrained-path
        |        +--rw named-explicit-paths
        |        |  +--rw named-explicit-path* [name]
        |        |     +--rw name                       -> ../config/name
        |        |     +--rw config
        |        |     |  +--rw name?   string
        |        |     +--ro state
        |        |     |  +--ro name?   string
        |        |     +--rw explicit-route-objects
        |        |        +--rw explicit-route-object* [index]
        |        |           +--rw index     -> ../config/index
        |        |           +--rw config
        |        |           |  +--rw address?    openconfig-inet-types:ipv4-address
        |        |           |  +--rw hop-type?   mpls-hop-type
        |        |           |  +--rw index?      uint8
        |        |           +--ro state
        |        |              +--ro address?    openconfig-inet-types:ipv4-address
        |        |              +--ro hop-type?   mpls-hop-type
        |        |              +--ro index?      uint8
        |        +--rw tunnels
        |           +--rw tunnel* [name]
        |              +--rw name                      -> ../config/name
        |              +--rw config
        |              |  +--rw name?                                  string
        |              |  +--rw type?                                  identityref
        |              |  +--rw signaling-protocol?                    identityref
        |              |  +--rw description?                           string
        |              |  +--rw admin-status?                          identityref
        |              |  +--rw metric-type?                           identityref
        |              |  +--rw metric?                                int32
        |              |  +--rw protection-style-requested?            identityref
        |              |  +--rw source?                                openconfig-inet-
types:ipv4-address
        |              |  +--rw ipi-oc-ni-augments:protection-role?    identityref
        |              +--ro state
        |              |  +--ro name?                                  string
        |              |  +--ro type?                                  identityref
        |              |  +--ro signaling-protocol?                    identityref
        |              |  +--ro description?                           string
        |              |  +--ro admin-status?                          identityref
```

```
        |               |  +--ro metric-type?                           identityref
        |               |  +--ro metric?                                int32
        |               |  +--ro protection-style-requested?            identityref
        |               |  +--ro source?                                openconfig-inet-
types:ipv4-address
        |               |  +--ro role?                                  identityref
        |               |  +--ro ipi-oc-ni-augments:protection-role?    identityref
        |               +--rw bandwidth
        |               |  +--rw config
        |               |  |  +--rw specification-type?   te-bandwidth-type
        |               |  |  +--rw set-bandwidth?        oc-mplst:bandwidth-kbps
        |               |  +--ro state
        |               |  |  +--ro specification-type?   te-bandwidth-type
        |               |  |  +--ro set-bandwidth?        oc-mplst:bandwidth-kbps
        |               |  |  +--ro signaled-bandwidth?   oc-mplst:bandwidth-kbps
        |               |  +--rw auto-bandwidth
        |               |     +--rw config
        |               |     |  +--rw min-bw?            oc-mplst:bandwidth-kbps
        |               |     |  +--rw max-bw?            oc-mplst:bandwidth-kbps
        |               |     |  +--rw adjust-interval?   uint32
        |               |     +--ro state
        |               |     |  +--ro min-bw?             oc-mplst:bandwidth-kbps
        |               |     |  +--ro max-bw?             oc-mplst:bandwidth-kbps
        |               |     |  +--ro adjust-interval?    uint32
        |               |     |  +--ro interval-high-bw?   oc-mplst:bandwidth-kbps
        |               |     +--rw overflow
        |               |     |  +--rw config
        |               |     |  |  +--rw overflow-threshold?    openconfig-
types:percentage
        |               |     |  |  +--rw trigger-event-count?   uint16
        |               |     |  +--ro state
        |               |     |     +--ro overflow-threshold?    openconfig-
types:percentage
        |               |     |     +--ro trigger-event-count?   uint16
        |               |     +--rw underflow
        |               |        +--rw config
        |               |        |  +--rw underflow-threshold?   openconfig-
types:percentage
        |               |        |  +--rw trigger-event-count?   uint16
        |               |        +--ro state
        |               |           +--ro underflow-threshold?   openconfig-
types:percentage
        |               |           +--ro trigger-event-count?   uint16
        |               +--rw p2p-tunnel-attributes
        |                  +--rw config
        |                  |  +--rw destination?            openconfig-inet-types:ipv4-
address
        |                  |  +--rw record-route-enabled?   boolean
        |                  +--ro state
        |                  |  +--ro destination?            openconfig-inet-types:ipv4-
address
        |                  |  +--ro record-route-enabled?   boolean
```

```
        |                 +--rw p2p-primary-path
        |                 |  +--rw p2p-primary-path* [name]
        |                 |     +--rw name                              -> ../config/name
        |                 |     +--rw config
        |                 |     |  +--rw name?                        string
        |                 |     |  +--rw path-computation-method?   identityref
        |                 |     |  +--rw use-cspf?                    boolean
        |                 |     |  +--rw explicit-path-name?          -> ../../../../../
../../named-explicit-paths/named-explicit-path/config/name
        |                 |     |  +--rw setup-priority?              uint8
        |                 |     |  +--rw hold-priority?               uint8
        |                 |     |  +--rw retry-timer?                 uint16
        |                 |     +--ro state
        |                 |     |  +--ro name?                         string
        |                 |     |  +--ro path-computation-method?    identityref
        |                 |     |  +--ro use-cspf?                     boolean
        |                 |     |  +--ro explicit-path-name?          -> ../../../../../
../../named-explicit-paths/named-explicit-path/config/name
        |                 |     |  +--ro setup-priority?               uint8
        |                 |     |  +--ro hold-priority?                uint8
        |                 |     |  +--ro retry-timer?                  uint16
        |                 |     |  +--ro associated-rsvp-sessions*   -> ../../../../../
../../../../signaling-protocols/rsvp-te/sessions/session/local-index
        |                 |     +--rw path-metric-bound-constraints
        |                 |     |  +--rw path-metric-bound-constraint* [type]
        |                 |     |     +--rw type      -> ../config/type
        |                 |     |     +--rw config
        |                 |     |     |  +--rw type?                   identityref
        |                 |     |     |  +--rw metric-upper-bound?   uint16
        |                 |     |     +--ro state
        |                 |     |        +--ro type?                   identityref
        |                 |     |        +--ro metric-upper-bound?   uint16
        |                 |     +--rw admin-groups
        |                 |        +--rw config
        |                 |        |  +--rw exclude-group*       -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                 |        |  +--rw include-all-group*   -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                 |        |  +--rw include-any-group*   -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                 |        +--ro state
        |                 |           +--ro exclude-group*       -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                 |           +--ro include-all-group*   -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                 |           +--ro include-any-group*   -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                 +--rw p2p-secondary-paths
        |                    +--rw p2p-secondary-path* [name]
        |                       +--rw name                               -> ../config/name
        |                       +--rw config
        |                       |  +--rw name?                        string
```

```
        |                       |  +--rw path-computation-method?   identityref
        |                       |  +--rw use-cspf?                  boolean
        |                       |  +--rw explicit-path-name?        -> ../../../../../
../../named-explicit-paths/named-explicit-path/config/name
        |                       |  +--rw setup-priority?            uint8
        |                       |  +--rw hold-priority?             uint8
        |                       |  +--rw retry-timer?               uint16
        |                       +--ro state
        |                       |  +--ro name?                       string
        |                       |  +--ro path-computation-method?    identityref
        |                       |  +--ro use-cspf?                   boolean
        |                       |  +--ro explicit-path-name?         -> ../../../../../
../../named-explicit-paths/named-explicit-path/config/name
        |                       |  +--ro setup-priority?             uint8
        |                       |  +--ro hold-priority?              uint8
        |                       |  +--ro retry-timer?                uint16
        |                       |  +--ro associated-rsvp-sessions*   -> ../../../../../
../../../../signaling-protocols/rsvp-te/sessions/session/local-index
        |                       +--rw path-metric-bound-constraints
        |                       |  +--rw path-metric-bound-constraint* [type]
        |                       |     +--rw type      -> ../config/type
        |                       |     +--rw config
        |                       |     |  +--rw type?                 identityref
        |                       |     |  +--rw metric-upper-bound?   uint16
        |                       |     +--ro state
        |                       |        +--ro type?                 identityref
        |                       |        +--ro metric-upper-bound?   uint16
        |                       +--rw admin-groups
        |                          +--rw config
        |                          |  +--rw exclude-group*       -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                          |  +--rw include-all-group*   -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                          |  +--rw include-any-group*   -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                          +--ro state
        |                             +--ro exclude-group*       -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                             +--ro include-all-group*   -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        |                             +--ro include-any-group*   -> ../../../../../../
../../../../te-global-attributes/mpls-admin-groups/admin-group/admin-group-name
        +--rw vlans
        |  +--rw vlan* [vlan-id]
        |     +--rw vlan-id    -> ../config/vlan-id
        |     +--rw config
        |     |  +--rw vlan-id?   oc-vlan-types:vlan-id
        |     |  +--rw name?      string
        |     |  +--rw status?    enumeration
        |     +--ro state
        |     |  +--ro vlan-id?   oc-vlan-types:vlan-id
        |     |  +--ro name?      string
```

```
|     |  +--ro status?    enumeration
|     +--rw members
|        +--ro member* []
|           +--ro state
|              +--ro interface?   base-interface-ref
+--rw protocols
   +--rw protocol* [identifier name]
      +--rw identifier       -> ../config/identifier
      +--rw name             -> ../config/name
      +--rw config
      |  +--rw identifier?       identityref
      |  +--rw name?             string
      |  +--rw enabled?          boolean
      |  +--rw default-metric?   uint32
      +--ro state
      |  +--ro identifier?       identityref
      |  +--ro name?             string
      |  +--ro enabled?          boolean
      |  +--ro default-metric?   uint32
      +--rw static-routes
      |  +--rw static* [prefix]
      |     +--rw prefix       -> ../config/prefix
      |     +--rw config
      |     |  +--rw prefix?        inet:ip-prefix
      |     |  +--rw set-tag?       oc-pt:tag-type
      |     |  +--rw description?   string
      |     +--ro state
      |     |  +--ro prefix?        inet:ip-prefix
      |     |  +--ro set-tag?       oc-pt:tag-type
      |     |  +--ro description?   string
      |     +--rw next-hops
      |        +--rw next-hop* [index]
      |           +--rw index            -> ../config/index
      |           +--rw config
      |           |  +--rw index?      string
      |           |  +--rw next-hop?   union
      |           |  +--rw recurse?    boolean
      |           |  +--rw metric?     uint32
      |           +--ro state
      |           |  +--ro index?        string
      |           |  +--ro next-hop?     union
      |           |  +--ro recurse?      boolean
      |           |  +--ro metric?       uint32
      |           |  +--ro preference?   uint32
      |           +--rw enable-bfd
      |           |  +--rw config
      |           |  |  +--rw enabled?   boolean
      |           |  +--ro state
      |           |     +--ro enabled?   boolean
      |           +--rw interface-ref
```

```
              |              +--rw config
              |              |  +--rw interface?      -> /openconfig-
interfaces:interfaces/interface/name
              |              |  +--rw subinterface?   -> /openconfig-
interfaces:interfaces/interface[oc-if:name=current()/../interface]/subinterfaces/
subinterface/index
              |              +--ro state
              |                 +--ro interface?      -> /openconfig-
interfaces:interfaces/interface/name
              |                 +--ro subinterface?   -> /openconfig-
interfaces:interfaces/interface[oc-if:name=current()/../interface]/subinterfaces/
subinterface/index
              +--rw bgp
              |  +--rw global
              |  |  +--rw config
              |  |  |  +--rw as           openconfig-inet-types:as-number
              |  |  |  +--rw router-id?   openconfig-yang-types:dotted-quad
              |  |  +--ro state
              |  |  |  +--ro as                openconfig-inet-types:as-number
              |  |  |  +--ro router-id?        openconfig-yang-types:dotted-quad
              |  |  |  +--ro total-prefixes?   uint32
              |  |  +--rw confederation
              |  |  |  +--rw config
              |  |  |  |  +--rw identifier?   openconfig-inet-types:as-number
              |  |  |  |  +--rw member-as*    openconfig-inet-types:as-number
              |  |  |  +--ro state
              |  |  |     +--ro identifier?   openconfig-inet-types:as-number
              |  |  |     +--ro member-as*    openconfig-inet-types:as-number
              |  |  +--rw graceful-restart
              |  |  |  +--rw config
              |  |  |  |  +--rw enabled?             boolean
              |  |  |  |  +--rw restart-time?        uint16
              |  |  |  |  +--rw stale-routes-time?   uint16
              |  |  |  |  +--rw helper-only?         boolean
              |  |  |  +--ro state
              |  |  |     +--ro enabled?             boolean
              |  |  |     +--ro restart-time?        uint16
              |  |  |     +--ro stale-routes-time?   uint16
              |  |  |     +--ro helper-only?         boolean
              |  |  +--rw route-selection-options
              |  |  |  +--rw config
              |  |  |  |  +--rw always-compare-med?           boolean
              |  |  |  |  +--rw ignore-as-path-length?        boolean
              |  |  |  |  +--rw external-compare-router-id?   boolean
              |  |  |  |  +--rw enable-aigp?                  boolean
              |  |  |  +--ro state
              |  |  |     +--ro always-compare-med?           boolean
              |  |  |     +--ro ignore-as-path-length?        boolean
              |  |  |     +--ro external-compare-router-id?   boolean
              |  |  |     +--ro enable-aigp?                  boolean
              |  |  +--rw afi-safis
              |  |  |  +--rw afi-safi* [afi-safi-name]
```

```
|  |  |     +--rw afi-safi-name         -> ../config/afi-safi-name
|  |  |     +--rw config
|  |  |     |  +--rw afi-safi-name?         identityref
|  |  |     |  +--rw send-community-type*   oc-bgp-types:community-type
|  |  |     +--ro state
|  |  |     |  +--ro afi-safi-name?         identityref
|  |  |     |  +--ro send-community-type*   oc-bgp-types:community-type
|  |  |     |  +--ro total-prefixes?        uint32
|  |  |     +--rw use-multiple-paths
|  |  |     |  +--rw config
|  |  |     |  +--rw ebgp
|  |  |     |  |  +--rw link-bandwidth-ext-community
|  |  |     |  |  |  +--rw config
|  |  |     |  |  |  |  +--rw enabled?   boolean
|  |  |     |  |  |  +--ro state
|  |  |     |  |  |     +--ro enabled?   boolean
|  |  |     |  |  +--rw config
|  |  |     |  |  |  +--rw maximum-paths?   uint32
|  |  |     |  |  +--ro state
|  |  |     |  |     +--ro maximum-paths?   uint32
|  |  |     |  +--rw ibgp
|  |  |     |     +--rw link-bandwidth-ext-community
|  |  |     |     |  +--rw config
|  |  |     |     |  |  +--rw enabled?   boolean
|  |  |     |     |  +--ro state
|  |  |     |     |     +--ro enabled?   boolean
|  |  |     |     +--rw config
|  |  |     |     |  +--rw maximum-paths?   uint32
|  |  |     |     +--ro state
|  |  |     |        +--ro maximum-paths?   uint32
|  |  |     +--rw add-paths
|  |  |     |  +--rw config
|  |  |     |  |  +--rw receive?    boolean
|  |  |     |  |  +--rw send?       boolean
|  |  |     |  |  +--rw send-max?   uint8
|  |  |     |  +--ro state
|  |  |     |     +--ro receive?    boolean
|  |  |     |     +--ro send?       boolean
|  |  |     |     +--ro send-max?   uint8
|  |  |     +--rw apply-policy
|  |  |        +--rw config
|  |  |        |  +--rw default-import-policy?   default-policy-type
|  |  |        |  +--rw default-export-policy?   default-policy-type
|  |  |        +--ro state
|  |  |           +--ro default-import-policy?   default-policy-type
|  |  |           +--ro default-export-policy?   default-policy-type
|  |  +--rw apply-policy
|  |     +--rw config
|  |     |  +--rw default-import-policy?   default-policy-type
|  |     |  +--rw default-export-policy?   default-policy-type
```

```
               |  |     +--ro state
               |  |        +--ro default-import-policy?   default-policy-type
               |  |        +--ro default-export-policy?   default-policy-type
               |  +--rw neighbors
               |  |  +--rw neighbor* [neighbor-address]
               |  |     +--rw neighbor-address    -> ../config/neighbor-address
               |  |     +--rw config
               |  |     |  +--rw peer-group?          -> ../../../../peer-groups/peer-
group/peer-group-name
               |  |     |  +--rw neighbor-address?    openconfig-inet-types:ip-address
               |  |     |  +--rw enabled?             boolean
               |  |     |  +--rw peer-as?             openconfig-inet-types:as-number
               |  |     |  +--rw local-as?            openconfig-inet-types:as-number
               |  |     |  +--rw auth-password?       openconfig-types:routing-password
               |  |     |  +--rw remove-private-as?   oc-bgp-types:remove-private-as-
option
               |  |     |  +--rw description?         string
               |  |     +--ro state
               |  |     |  +--ro peer-group?          -> ../../../../peer-groups/peer-
group/peer-group-name
               |  |     |  +--ro neighbor-address?    openconfig-inet-types:ip-address
               |  |     |  +--ro enabled?             boolean
               |  |     |  +--ro peer-as?             openconfig-inet-types:as-number
               |  |     |  +--ro local-as?            openconfig-inet-types:as-number
               |  |     |  +--ro auth-password?       openconfig-types:routing-password
               |  |     |  +--ro remove-private-as?   oc-bgp-types:remove-private-as-
option
               |  |     |  +--ro description?         string
               |  |     +--rw timers
               |  |     |  +--rw config
               |  |     |  |  +--rw connect-retry?                   uint16
               |  |     |  |  +--rw hold-time?                       uint16
               |  |     |  |  +--rw keepalive-interval?              uint16
               |  |     |  |  +--rw minimum-advertisement-interval?  uint16
               |  |     |  +--ro state
               |  |     |     +--ro connect-retry?                   uint16
               |  |     |     +--ro hold-time?                       uint16
               |  |     |     +--ro keepalive-interval?              uint16
               |  |     |     +--ro minimum-advertisement-interval?  uint16
               |  |     +--rw transport
               |  |     |  +--rw config
               |  |     |  |  +--rw passive-mode?    boolean
               |  |     |  |  +--rw local-address?   union
               |  |     |  +--ro state
               |  |     |     +--ro passive-mode?     boolean
               |  |     |     +--ro local-address?    union
               |  |     |     +--ro local-port?       openconfig-inet-types:port-number
               |  |     |     +--ro remote-address?   openconfig-inet-types:ip-address
               |  |     |     +--ro remote-port?      openconfig-inet-types:port-number
               |  |     +--rw ebgp-multihop
               |  |     |  +--rw config
```

```
               |  |     |  |  +--rw enabled?        boolean
               |  |     |  |  +--rw multihop-ttl?   uint8
               |  |     |  +--ro state
               |  |     |     +--ro enabled?        boolean
               |  |     |     +--ro multihop-ttl?   uint8
               |  |     +--rw route-reflector
               |  |     |  +--rw config
               |  |     |  |  +--rw route-reflector-client?   boolean
               |  |     |  +--ro state
               |  |     |     +--ro route-reflector-client?   boolean
               |  |     +--rw afi-safis
               |  |     |  +--rw afi-safi* [afi-safi-name]
               |  |     |     +--rw afi-safi-name           -> ../config/afi-safi-name
               |  |     |     +--rw config
               |  |     |     |  +--rw afi-safi-name?         identityref
               |  |     |     |  +--rw enabled?               boolean
               |  |     |     |  +--rw send-community-type*   oc-bgp-types:community-type
               |  |     |     +--ro state
               |  |     |     |  +--ro afi-safi-name?         identityref
               |  |     |     |  +--ro enabled?               boolean
               |  |     |     |  +--ro send-community-type*   oc-bgp-types:community-type
               |  |     |     |  +--ro prefixes
               |  |     |     |     +--ro sent?        uint32
               |  |     |     |     +--ro installed?   uint32
               |  |     |     +--rw graceful-restart
               |  |     |     |  +--rw config
               |  |     |     |  |  +--rw enabled?   boolean
               |  |     |     |  +--ro state
               |  |     |     |     +--ro enabled?      boolean
               |  |     |     |     +--ro received?     boolean
               |  |     |     |     +--ro advertised?   boolean
               |  |     |     +--rw add-paths
               |  |     |     |  +--rw config
               |  |     |     |  |  +--rw receive?    boolean
               |  |     |     |  |  +--rw send?       boolean
               |  |     |     |  |  +--rw send-max?   uint8
               |  |     |     |  +--ro state
               |  |     |     |     +--ro receive?    boolean
               |  |     |     |     +--ro send?       boolean
               |  |     |     |     +--ro send-max?   uint8
               |  |     |     +--rw apply-policy
               |  |     |     |  +--rw config
               |  |     |     |  |  +--rw import-policy*   -> /openconfig-routing-
policy:routing-policy/policy-definitions/policy-definition/name
               |  |     |     |  |  +--rw export-policy*   -> /openconfig-routing-
policy:routing-policy/policy-definitions/policy-definition/name
               |  |     |     |  +--ro state
               |  |     |     |     +--ro import-policy*   -> /openconfig-routing-
policy:routing-policy/policy-definitions/policy-definition/name
               |  |     |     |     +--ro export-policy*   -> /openconfig-routing-
policy:routing-policy/policy-definitions/policy-definition/name
```

```
              |  |     |     +--rw ipv4-unicast
              |  |     |     |  +--rw prefix-limit
              |  |     |     |  |  +--rw config
              |  |     |     |  |  |  +--rw max-prefixes?            uint32
              |  |     |     |  |  |  +--rw prevent-teardown?        boolean
              |  |     |     |  |  |  +--rw warning-threshold-pct?   openconfig-
types:percentage
              |  |     |     |  |  +--ro state
              |  |     |     |  |     +--ro max-prefixes?            uint32
              |  |     |     |  |     +--ro prevent-teardown?        boolean
              |  |     |     |  |     +--ro warning-threshold-pct?   openconfig-
types:percentage
              |  |     |     |  +--rw config
              |  |     |     |  |  +--rw send-default-route?   boolean
              |  |     |     |  +--ro state
              |  |     |     |     +--ro send-default-route?   boolean
              |  |     |     +--rw ipv6-unicast
              |  |     |     |  +--rw prefix-limit
              |  |     |     |  |  +--rw config
              |  |     |     |  |  |  +--rw max-prefixes?            uint32
              |  |     |     |  |  |  +--rw prevent-teardown?        boolean
              |  |     |     |  |  |  +--rw warning-threshold-pct?   openconfig-
types:percentage
              |  |     |     |  |  +--ro state
              |  |     |     |  |     +--ro max-prefixes?            uint32
              |  |     |     |  |     +--ro prevent-teardown?        boolean
              |  |     |     |  |     +--ro warning-threshold-pct?   openconfig-
types:percentage
              |  |     |     |  +--rw config
              |  |     |     |  |  +--rw send-default-route?   boolean
              |  |     |     |  +--ro state
              |  |     |     |     +--ro send-default-route?   boolean
              |  |     |     +--rw ipv4-labeled-unicast
              |  |     |     |  +--rw prefix-limit
              |  |     |     |     +--rw config
              |  |     |     |     |  +--rw max-prefixes?            uint32
              |  |     |     |     |  +--rw prevent-teardown?        boolean
              |  |     |     |     |  +--rw warning-threshold-pct?   openconfig-
types:percentage
              |  |     |     |     +--ro state
              |  |     |     |        +--ro max-prefixes?            uint32
              |  |     |     |        +--ro prevent-teardown?        boolean
              |  |     |     |        +--ro warning-threshold-pct?   openconfig-
types:percentage
              |  |     |     +--rw ipv6-labeled-unicast
              |  |     |     |  +--rw prefix-limit
              |  |     |     |     +--rw config
              |  |     |     |     |  +--rw max-prefixes?            uint32
              |  |     |     |     |  +--rw prevent-teardown?        boolean
              |  |     |     |     |  +--rw warning-threshold-pct?   openconfig-
types:percentage
              |  |     |     |     +--ro state
```

```
               |  |     |     |        +--ro max-prefixes?            uint32
               |  |     |     |        +--ro prevent-teardown?        boolean
               |  |     |     |        +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     +--rw l3vpn-ipv4-unicast
               |  |     |     |  +--rw prefix-limit
               |  |     |     |     +--rw config
               |  |     |     |     |  +--rw max-prefixes?            uint32
               |  |     |     |     |  +--rw prevent-teardown?        boolean
               |  |     |     |     |  +--rw warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     |     +--ro state
               |  |     |     |        +--ro max-prefixes?            uint32
               |  |     |     |        +--ro prevent-teardown?        boolean
               |  |     |     |        +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     +--rw l3vpn-ipv6-unicast
               |  |     |     |  +--rw prefix-limit
               |  |     |     |     +--rw config
               |  |     |     |     |  +--rw max-prefixes?            uint32
               |  |     |     |     |  +--rw prevent-teardown?        boolean
               |  |     |     |     |  +--rw warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     |     +--ro state
               |  |     |     |        +--ro max-prefixes?            uint32
               |  |     |     |        +--ro prevent-teardown?        boolean
               |  |     |     |        +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     +--rw l2vpn-vpls
               |  |     |     |  +--rw prefix-limit
               |  |     |     |     +--rw config
               |  |     |     |     |  +--rw max-prefixes?            uint32
               |  |     |     |     |  +--rw prevent-teardown?        boolean
               |  |     |     |     |  +--rw warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     |     +--ro state
               |  |     |     |        +--ro max-prefixes?            uint32
               |  |     |     |        +--ro prevent-teardown?        boolean
               |  |     |     |        +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     +--rw l2vpn-evpn
               |  |     |        +--rw prefix-limit
               |  |     |           +--rw config
               |  |     |           |  +--rw max-prefixes?            uint32
               |  |     |           |  +--rw prevent-teardown?        boolean
               |  |     |           |  +--rw warning-threshold-pct?   openconfig-
types:percentage
               |  |     |           +--ro state
               |  |     |              +--ro max-prefixes?            uint32
               |  |     |              +--ro prevent-teardown?        boolean
               |  |     |              +--ro warning-threshold-pct?   openconfig-
types:percentage
```

```
|  |     +--rw enable-bfd
|  |        +--rw config
|  |        |  +--rw enabled?                        boolean
|  |        |  +--rw desired-minimum-tx-interval?   uint32
|  |        |  +--rw required-minimum-receive?      uint32
|  |        |  +--rw detection-multiplier?          uint8
|  |        +--ro state
|  |           +--ro enabled?                        boolean
|  |           +--ro desired-minimum-tx-interval?   uint32
|  |           +--ro required-minimum-receive?      uint32
|  |           +--ro detection-multiplier?          uint8
|  +--rw peer-groups
|  |  +--rw peer-group* [peer-group-name]
|  |     +--rw peer-group-name    -> ../config/peer-group-name
|  |     +--rw config
|  |     |  +--rw peer-group-name?   string
|  |     |  +--rw peer-as?           openconfig-inet-types:as-number
|  |     |  +--rw local-as?          openconfig-inet-types:as-number
|  |     |  +--rw auth-password?     openconfig-types:routing-password
|  |     |  +--rw description?       string
|  |     +--ro state
|  |     |  +--ro peer-group-name?   string
|  |     |  +--ro peer-as?           openconfig-inet-types:as-number
|  |     |  +--ro local-as?          openconfig-inet-types:as-number
|  |     |  +--ro auth-password?     openconfig-types:routing-password
|  |     |  +--ro description?       string
|  |     +--rw timers
|  |     |  +--rw config
|  |     |  |  +--rw connect-retry?                    uint16
|  |     |  |  +--rw hold-time?                        uint16
|  |     |  |  +--rw keepalive-interval?               uint16
|  |     |  |  +--rw minimum-advertisement-interval?   uint16
|  |     |  +--ro state
|  |     |     +--ro connect-retry?                    uint16
|  |     |     +--ro hold-time?                        uint16
|  |     |     +--ro keepalive-interval?               uint16
|  |     |     +--ro minimum-advertisement-interval?   uint16
|  |     +--rw transport
|  |     |  +--rw config
|  |     |  |  +--rw passive-mode?    boolean
|  |     |  |  +--rw local-address?   union
|  |     |  +--ro state
|  |     |     +--ro passive-mode?    boolean
|  |     |     +--ro local-address?   union
|  |     +--rw ebgp-multihop
|  |     |  +--rw config
|  |     |  |  +--rw enabled?        boolean
|  |     |  |  +--rw multihop-ttl?   uint8
|  |     |  +--ro state
|  |     |     +--ro enabled?        boolean
```

```
              |  |     |     +--ro multihop-ttl?   uint8
              |  |     +--rw route-reflector
              |  |     |  +--rw config
              |  |     |  |  +--rw route-reflector-client?   boolean
              |  |     |  +--ro state
              |  |     |     +--ro route-reflector-client?   boolean
              |  |     +--rw afi-safis
              |  |     |  +--rw afi-safi* [afi-safi-name]
              |  |     |     +--rw afi-safi-name          -> ../config/afi-safi-name
              |  |     |     +--rw config
              |  |     |     |  +--rw afi-safi-name?         identityref
              |  |     |     |  +--rw enabled?               boolean
              |  |     |     |  +--rw send-community-type*   oc-bgp-types:community-type
              |  |     |     +--ro state
              |  |     |     |  +--ro afi-safi-name?         identityref
              |  |     |     |  +--ro enabled?               boolean
              |  |     |     |  +--ro send-community-type*   oc-bgp-types:community-type
              |  |     |     +--rw apply-policy
              |  |     |     |  +--rw config
              |  |     |     |  |  +--rw import-policy*   -> /openconfig-routing-
policy:routing-policy/policy-definitions/policy-definition/name
              |  |     |     |  |  +--rw export-policy*   -> /openconfig-routing-
policy:routing-policy/policy-definitions/policy-definition/name
              |  |     |     |  +--ro state
              |  |     |     |     +--ro import-policy*   -> /openconfig-routing-
policy:routing-policy/policy-definitions/policy-definition/name
              |  |     |     |     +--ro export-policy*   -> /openconfig-routing-
policy:routing-policy/policy-definitions/policy-definition/name
              |  |     |     +--rw ipv4-unicast
              |  |     |     |  +--rw prefix-limit
              |  |     |     |  |  +--rw config
              |  |     |     |  |  |  +--rw max-prefixes?            uint32
              |  |     |     |  |  |  +--rw prevent-teardown?        boolean
              |  |     |     |  |  |  +--rw warning-threshold-pct?   openconfig-
types:percentage
              |  |     |     |  |  +--ro state
              |  |     |     |  |     +--ro max-prefixes?            uint32
              |  |     |     |  |     +--ro prevent-teardown?        boolean
              |  |     |     |  |     +--ro warning-threshold-pct?   openconfig-
types:percentage
              |  |     |     |  +--rw config
              |  |     |     |  |  +--rw send-default-route?   boolean
              |  |     |     |  +--ro state
              |  |     |     |     +--ro send-default-route?   boolean
              |  |     |     +--rw ipv6-unicast
              |  |     |     |  +--rw prefix-limit
              |  |     |     |  |  +--rw config
              |  |     |     |  |  |  +--rw max-prefixes?            uint32
              |  |     |     |  |  |  +--rw prevent-teardown?        boolean
              |  |     |     |  |  |  +--rw warning-threshold-pct?   openconfig-
types:percentage
              |  |     |     |  |  +--ro state
```

```
               |  |     |     |  |     +--ro max-prefixes?            uint32
               |  |     |     |  |     +--ro prevent-teardown?        boolean
               |  |     |     |  |     +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     |  +--rw config
               |  |     |     |  |  +--rw send-default-route?   boolean
               |  |     |     |  +--ro state
               |  |     |     |     +--ro send-default-route?   boolean
               |  |     |     +--rw ipv4-labeled-unicast
               |  |     |     |  +--rw prefix-limit
               |  |     |     |     +--rw config
               |  |     |     |     |  +--rw max-prefixes?            uint32
               |  |     |     |     |  +--rw prevent-teardown?        boolean
               |  |     |     |     |  +--rw warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     |     +--ro state
               |  |     |     |        +--ro max-prefixes?            uint32
               |  |     |     |        +--ro prevent-teardown?        boolean
               |  |     |     |        +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     +--rw ipv6-labeled-unicast
               |  |     |     |  +--rw prefix-limit
               |  |     |     |     +--rw config
               |  |     |     |     |  +--rw max-prefixes?            uint32
               |  |     |     |     |  +--rw prevent-teardown?        boolean
               |  |     |     |     |  +--rw warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     |     +--ro state
               |  |     |     |        +--ro max-prefixes?            uint32
               |  |     |     |        +--ro prevent-teardown?        boolean
               |  |     |     |        +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     +--rw l3vpn-ipv4-unicast
               |  |     |     |  +--rw prefix-limit
               |  |     |     |     +--rw config
               |  |     |     |     |  +--rw max-prefixes?            uint32
               |  |     |     |     |  +--rw prevent-teardown?        boolean
               |  |     |     |     |  +--rw warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     |     +--ro state
               |  |     |     |        +--ro max-prefixes?            uint32
               |  |     |     |        +--ro prevent-teardown?        boolean
               |  |     |     |        +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     +--rw l3vpn-ipv6-unicast
               |  |     |     |  +--rw prefix-limit
               |  |     |     |     +--rw config
               |  |     |     |     |  +--rw max-prefixes?            uint32
               |  |     |     |     |  +--rw prevent-teardown?        boolean
               |  |     |     |     |  +--rw warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     |     +--ro state
```

```
               |  |     |     |        +--ro max-prefixes?            uint32
               |  |     |     |        +--ro prevent-teardown?        boolean
               |  |     |     |        +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     +--rw l2vpn-vpls
               |  |     |     |  +--rw prefix-limit
               |  |     |     |     +--rw config
               |  |     |     |     |  +--rw max-prefixes?            uint32
               |  |     |     |     |  +--rw prevent-teardown?        boolean
               |  |     |     |     |  +--rw warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     |     +--ro state
               |  |     |     |        +--ro max-prefixes?            uint32
               |  |     |     |        +--ro prevent-teardown?        boolean
               |  |     |     |        +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     |     +--rw l2vpn-evpn
               |  |     |        +--rw prefix-limit
               |  |     |           +--rw config
               |  |     |           |  +--rw max-prefixes?            uint32
               |  |     |           |  +--rw prevent-teardown?        boolean
               |  |     |           |  +--rw warning-threshold-pct?   openconfig-
types:percentage
               |  |     |           +--ro state
               |  |     |              +--ro max-prefixes?            uint32
               |  |     |              +--ro prevent-teardown?        boolean
               |  |     |              +--ro warning-threshold-pct?   openconfig-
types:percentage
               |  |     +--rw enable-bfd
               |  |        +--rw config
               |  |        |  +--rw enabled?                        boolean
               |  |        |  +--rw desired-minimum-tx-interval?    uint32
               |  |        |  +--rw required-minimum-receive?       uint32
               |  |        |  +--rw detection-multiplier?           uint8
               |  |        +--ro state
               |  |           +--ro enabled?                        boolean
               |  |           +--ro desired-minimum-tx-interval?    uint32
               |  |           +--ro required-minimum-receive?       uint32
               |  |           +--ro detection-multiplier?           uint8
               |  +--ro rib
               |     +--ro afi-safis
               |        +--ro afi-safi* [afi-safi-name]
               |           +--ro afi-safi-name    -> ../state/afi-safi-name
               |           +--ro state
               |           |  +--ro afi-safi-name?   identityref
               |           +--ro ipv4-unicast
               |           |  +--ro loc-rib
               |           |  |  +--ro routes
               |           |  |     +--ro route* [prefix origin path-id]
               |           |  |        +--ro prefix     -> ../state/prefix
               |           |  |        +--ro origin     -> ../state/origin
```

```
              |           |  |        +--ro path-id    -> ../state/path-id
              |           |  |        +--ro state
             |          |  |          +--ro prefix?         openconfig-inet-types:ipv4-
prefix
              |           |  |           +--ro origin?          union
              |           |  |           +--ro path-id?         uint32
              |           |  |           +--ro last-modified?   openconfig-
types:timeticks64
              |           |  |           +--ro valid-route?     boolean
              |           |  +--ro neighbors
              |           |     +--ro neighbor* [neighbor-address]
             |           |       +--ro neighbor-address    -> ../state/neighbor-address
              |           |       +--ro state
             |           |       |  +--ro neighbor-address?   openconfig-inet-types:ip-
address
              |           |       +--ro adj-rib-in-post
              |           |       |  +--ro routes
              |           |       |     +--ro route* [prefix path-id]
              |           |       |        +--ro prefix     -> ../state/prefix
              |           |       |        +--ro path-id    -> ../state/path-id
              |           |       |        +--ro state
              |           |       |           +--ro prefix?          openconfig-inet-
types:ipv4-prefix
              |           |       |           +--ro path-id?         uint32
              |           |       |           +--ro last-modified?   openconfig-
types:timeticks64
              |           |       |           +--ro valid-route?     boolean
              |           |       +--ro adj-rib-out-post
              |           |          +--ro routes
              |           |             +--ro route* [prefix path-id]
              |           |                +--ro prefix     -> ../state/prefix
              |           |                +--ro path-id    -> ../state/path-id
              |           |                +--ro state
              |           |                   +--ro prefix?          openconfig-inet-
types:ipv4-prefix
              |           |                   +--ro path-id?         uint32
              |           |                   +--ro last-modified?   openconfig-
types:timeticks64
              |           |                   +--ro valid-route?     boolean
              |           +--ro ipv6-unicast
              |              +--ro loc-rib
              |              |  +--ro routes
              |              |     +--ro route* [prefix origin path-id]
              |              |        +--ro prefix     -> ../state/prefix
              |              |        +--ro origin     -> ../state/origin
              |              |        +--ro path-id    -> ../state/path-id
              |              |        +--ro state
             |               |          +--ro prefix?         openconfig-inet-types:ipv6-
prefix
              |              |           +--ro origin?          union
              |              |           +--ro path-id?         uint32
```

```
               |              |           +--ro last-modified?   openconfig-
types:timeticks64
               |              |           +--ro valid-route?     boolean
               |              +--ro neighbors
               |                 +--ro neighbor* [neighbor-address]
               |                  +--ro neighbor-address    -> ../state/neighbor-address
               |                    +--ro state
               |                    |  +--ro neighbor-address?   openconfig-inet-types:ip-
address
               |                    +--ro adj-rib-in-post
               |                    |  +--ro routes
               |                    |     +--ro route* [prefix path-id]
               |                    |        +--ro prefix     -> ../state/prefix
               |                    |        +--ro path-id    -> ../state/path-id
               |                    |        +--ro state
               |                    |           +--ro prefix?          openconfig-inet-
types:ipv6-prefix
               |                    |           +--ro path-id?         uint32
               |                    |           +--ro last-modified?   openconfig-
types:timeticks64
               |                    |           +--ro valid-route?     boolean
               |                    +--ro adj-rib-out-post
               |                       +--ro routes
               |                          +--ro route* [prefix path-id]
               |                             +--ro prefix     -> ../state/prefix
               |                             +--ro path-id    -> ../state/path-id
               |                             +--ro state
               |                                +--ro prefix?          openconfig-inet-
types:ipv6-prefix
               |                                +--ro path-id?         uint32
               |                                +--ro last-modified?   openconfig-
types:timeticks64
               |                                +--ro valid-route?     boolean
               +--rw ospfv2
               |  +--rw global
               |  |  +--rw config
               |  |  |  +--rw router-id?                 yang:dotted-quad
               |  |  |  +--rw summary-route-cost-mode?   enumeration
               |  |  |  +--rw log-adjacency-changes?     boolean
               |  |  +--ro state
               |  |  |  +--ro router-id?                 yang:dotted-quad
               |  |  |  +--ro summary-route-cost-mode?   enumeration
               |  |  |  +--ro log-adjacency-changes?     boolean
               |  |  +--rw timers
               |  |  |  +--rw spf
               |  |  |  |  +--rw config
               |  |  |  |  |  +--rw initial-delay?   uint32
               |  |  |  |  |  +--rw maximum-delay?   uint32
               |  |  |  |  +--ro state
               |  |  |  |     +--ro initial-delay?   uint32
               |  |  |  |     +--ro maximum-delay?   uint32
               |  |  |  |     +--ro timer-type?      enumeration
```

```
               |  |  |  +--rw max-metric
               |  |  |  |  +--rw config
               |  |  |  |  |  +--rw set?       boolean
               |  |  |  |  |  +--rw include*   identityref
               |  |  |  |  +--ro state
               |  |  |  |     +--ro set?       boolean
               |  |  |  |     +--ro include*   identityref
               |  |  |  +--rw lsa-generation
               |  |  |     +--rw config
               |  |  |     |  +--rw initial-delay?   uint32
               |  |  |     |  +--rw maximum-delay?   uint32
               |  |  |     +--ro state
               |  |  |        +--ro initial-delay?   uint32
               |  |  |        +--ro maximum-delay?   uint32
               |  |  |        +--ro timer-type?      enumeration
               |  |  +--rw graceful-restart
               |  |  |  +--rw config
               |  |  |  |  +--rw enabled?   boolean
               |  |  |  +--ro state
               |  |  |     +--ro enabled?   boolean
               |  |  +--rw mpls
               |  |     +--rw config
               |  |     |  +--rw traffic-engineering-extensions?   boolean
               |  |     +--ro state
               |  |        +--ro traffic-engineering-extensions?   boolean
               |  +--rw areas
               |     +--rw area* [identifier]
               |        +--rw identifier       -> ../config/identifier
               |        +--rw config
               |        |  +--rw identifier?   oc-ospf-types:ospf-area-identifier
               |        +--ro state
               |        |  +--ro identifier?   oc-ospf-types:ospf-area-identifier
               |        +--rw interfaces
               |        |  +--rw interface* [id]
               |        |     +--rw id               -> ../config/id
               |        |     +--rw config
               |        |     |  +--rw id?                    openconfig-
interfaces:interface-id
               |        |     |  +--rw network-type?          identityref
               |        |     |  +--rw priority?              uint8
               |        |     |  +--rw authentication-type?   string
               |        |     |  +--rw metric?                oc-ospf-types:ospf-metric
               |        |     |  +--rw passive?               boolean
               |        |     +--ro state
               |        |     |  +--ro id?                    openconfig-
interfaces:interface-id
               |        |     |  +--ro network-type?          identityref
               |        |     |  +--ro priority?              uint8
               |        |     |  +--ro authentication-type?   string
               |        |     |  +--ro metric?                oc-ospf-types:ospf-metric
               |        |     |  +--ro passive?               boolean
```

```
               |        |     +--rw interface-ref
               |        |     |  +--rw config
               |        |     |  |  +--rw interface?      -> /openconfig-
interfaces:interfaces/interface/name
               |        |     |  |  +--rw subinterface?   -> /openconfig-
interfaces:interfaces/interface[oc-if:name=current()/../interface]/subinterfaces/
subinterface/index
               |        |     |  +--ro state
               |        |     |     +--ro interface?      -> /openconfig-
interfaces:interfaces/interface/name
               |        |     |     +--ro subinterface?   -> /openconfig-
interfaces:interfaces/interface[oc-if:name=current()/../interface]/subinterfaces/
subinterface/index
               |        |     +--rw timers
               |        |     |  +--rw config
               |        |     |  |  +--rw dead-interval?             uint32
               |        |     |  |  +--rw hello-interval?            uint32
               |        |     |  |  +--rw retransmission-interval?   uint32
               |        |     |  +--ro state
               |        |     |     +--ro dead-interval?             uint32
               |        |     |     +--ro hello-interval?            uint32
               |        |     |     +--ro retransmission-interval?   uint32
               |        |     +--rw mpls
               |        |     |  +--rw config
               |        |     |  |  +--rw traffic-engineering-metric?   uint32
               |        |     |  +--ro state
               |        |     |  |  +--ro traffic-engineering-metric?   uint32
               |        |     |  +--rw igp-ldp-sync
               |        |     |     +--rw config
               |        |     |     |  +--rw enabled?                 boolean
               |        |     |     |  +--rw post-session-up-delay?   uint32
               |        |     |     +--ro state
               |        |     |        +--ro enabled?                 boolean
               |        |     |        +--ro post-session-up-delay?   uint32
               |        |     +--rw lsa-filter
               |        |     |  +--rw config
               |        |     |  |  +--rw all?   boolean
               |        |     |  +--ro state
               |        |     |     +--ro all?   boolean
               |        |     +--rw enable-bfd
               |        |        +--rw config
               |        |        |  +--rw enabled?                          boolean
               |        |        |  +--rw desired-minimum-tx-interval?   uint32
               |        |        |  +--rw required-minimum-receive?      uint32
               |        |        |  +--rw detection-multiplier?          uint8
               |        |        +--ro state
               |        |           +--ro enabled?                          boolean
               |        |           +--ro desired-minimum-tx-interval?   uint32
               |        |           +--ro required-minimum-receive?      uint32
               |        |           +--ro detection-multiplier?          uint8
               |        +--rw virtual-links
               |           +--rw virtual-link* [remote-router-id]
```

```
|              +--rw remote-router-id    -> ../config/remote-router-id
|              +--rw config
|              |  +--rw remote-router-id?   inet:ipv4-address-no-zone
|              +--ro state
|                 +--ro remote-router-id?   inet:ipv4-address-no-zone
|                 +--ro adjacency-state?    identityref
+--rw isis
   +--rw global
   |  +--rw config
   |  |  +--rw net*                       oc-isis-types:net
   |  |  +--rw maximum-area-addresses?    uint8
   |  |  +--rw level-capability?          oc-isis-types:level-type
   |  |  +--rw weighted-ecmp?             boolean
   |  +--ro state
   |  |  +--ro net*                       oc-isis-types:net
   |  |  +--ro maximum-area-addresses?    uint8
   |  |  +--ro level-capability?          oc-isis-types:level-type
   |  |  +--ro weighted-ecmp?             boolean
   |  +--rw lsp-bit
   |  |  +--rw overload-bit
   |  |     +--rw config
   |  |     |  +--rw set-bit?           boolean
   |  |     |  +--rw set-bit-on-boot?   boolean
   |  |     +--ro state
   |  |     |  +--ro set-bit?           boolean
   |  |     |  +--ro set-bit-on-boot?   boolean
   |  |     +--rw reset-triggers
   |  |        +--rw reset-trigger* [reset-trigger]
   |  |           +--rw reset-trigger    -> ../config/reset-trigger
   |  |           +--rw config
   |  |           |  +--rw reset-trigger?   identityref
   |  |           |  +--rw delay?           uint32
   |  |           +--ro state
   |  |              +--ro reset-trigger?   identityref
   |  |              +--ro delay?           uint32
   |  +--rw graceful-restart
   |  |  +--rw config
   |  |  |  +--rw enabled?                       boolean
   |  |  |  +--rw non-planned-only?              boolean
   |  |  |  +--rw restart-time?                  uint16
   |  |  |  +--rw interface-timer?               uint16
   |  |  |  +--rw interface-time-expirations?    int64
   |  |  +--ro state
   |  |     +--ro enabled?                       boolean
   |  |     +--ro non-planned-only?              boolean
   |  |     +--ro restart-time?                  uint16
   |  |     +--ro interface-timer?               uint16
   |  |     +--ro interface-time-expirations?    int64
   |  +--rw timers
   |  |  +--rw config
```

```
|  |  |  +--rw lsp-lifetime-interval?   uint16
|  |  |  +--rw lsp-refresh-interval?    uint16
|  |  +--ro state
|  |  |  +--ro lsp-lifetime-interval?   uint16
|  |  |  +--ro lsp-refresh-interval?    uint16
|  |  +--rw spf
|  |  |  +--rw config
|  |  |  |  +--rw spf-first-interval?    uint64
|  |  |  |  +--rw spf-second-interval?   uint64
|  |  |  +--ro state
|  |  |     +--ro spf-first-interval?    uint64
|  |  |     +--ro spf-second-interval?   uint64
|  |  +--rw lsp-generation
|  |     +--rw config
|  |     |  +--rw lsp-max-wait-interval?   uint64
|  |     +--ro state
|  |        +--ro lsp-max-wait-interval?   uint64
|  +--rw transport
|  |  +--rw config
|  |  |  +--rw lsp-mtu-size?   uint16
|  |  +--ro state
|  |     +--ro lsp-mtu-size?   uint16
|  +--rw afi-safi
|  |  +--rw af* [afi-name safi-name]
|  |     +--rw afi-name     -> ../config/afi-name
|  |     +--rw safi-name    -> ../config/safi-name
|  |     +--rw config
|  |     |  +--rw afi-name?    identityref
|  |     |  +--rw safi-name?   identityref
|  |     |  +--rw metric?      uint32
|  |     +--ro state
|  |        +--ro afi-name?    identityref
|  |        +--ro safi-name?   identityref
|  |        +--ro metric?      uint32
|  +--rw inter-level-propagation-policies
|     +--rw level1-to-level2
|     |  +--rw config
|     |  |  +--rw default-import-policy?   default-policy-type
|     |  +--ro state
|     |     +--ro default-import-policy?   default-policy-type
|     +--rw level2-to-level1
|        +--rw config
|        |  +--rw default-import-policy?   default-policy-type
|        +--ro state
|           +--ro default-import-policy?   default-policy-type
+--rw levels
|  +--rw level* [level-number]
|     +--rw level-number             -> ../config/level-number
|     +--rw config
|     |  +--rw level-number?   oc-isis-types:level-number
```

```
                |     |  +--rw metric-style?   oc-isis-types:metric-style
                |     +--ro state
                |     |  +--ro level-number?   oc-isis-types:level-number
                |     |  +--ro metric-style?   oc-isis-types:metric-style
                |     +--rw graceful-restart
                |     |  +--rw config
                |     |  |  +--rw enabled?        boolean
                |     |  |  +--rw restart-time?   uint16
                |     |  +--ro state
                |     |     +--ro enabled?        boolean
                |     |     +--ro restart-time?   uint16
                |     +--rw system-level-counters
                |     |  +--ro state
                |     |     +--ro total-lsps?                       openconfig-yang-
types:counter32
                |     |     +--ro corrupted-lsps?                   openconfig-yang-
types:counter32
                |     |     +--ro database-overloads?               openconfig-yang-
types:counter32
                |     |     +--ro manual-address-drop-from-areas?   openconfig-yang-
types:counter32
                |     |     +--ro exceed-max-seq-nums?              openconfig-yang-
types:counter32
                |     |     +--ro seq-num-skips?                    openconfig-yang-
types:counter32
                |     |     +--ro own-lsp-purges?                   openconfig-yang-
types:counter32
                |     |     +--ro id-len-mismatch?                  openconfig-yang-
types:counter32
                |     |     +--ro part-changes?                     openconfig-yang-
types:counter32
                |     |     +--ro max-area-address-mismatches?      openconfig-yang-
types:counter32
                |     |     +--ro auth-fails?                       openconfig-yang-
types:counter32
                |     |     +--ro spf-runs?                         openconfig-yang-
types:counter32
                |     |     +--ro auth-type-fails?                  openconfig-yang-
types:counter32
                |     +--ro link-state-database
                |     |  +--ro lsp* [lsp-id]
                |     |     +--ro lsp-id    -> ../state/lsp-id
                |     |     +--ro state
                |     |     |  +--ro lsp-id?              oc-isis-types:lsp-id
                |     |     |  +--ro remaining-lifetime?  uint16
                |     |     |  +--ro sequence-number?     string
                |     |     |  +--ro checksum?            string
                |     |     |  +--ro pdu-length?          uint16
                |     |     |  +--ro flags*               enumeration
                |     |     +--ro tlvs
                |     |        +--ro tlv* [type]
                |     |           +--ro type                          -> ../state/type
                |     |           +--ro state
```

```
|      |           |  +--ro type?   identityref
|      |           +--ro area-address
|      |           |  +--ro state
|      |           |     +--ro address*   oc-isis-types:area-address
|      |           +--ro nlpid
|      |           |  +--ro state
|      |           |     +--ro nlpid*   enumeration
|      |           +--ro hostname
|      |           |  +--ro state
|      |           |     +--ro hostname*   string
|      |           +--ro ipv4-interface-addresses
|      |           |  +--ro state
|      |           |     +--ro address*   inet:ipv4-address
|      |           +--ro ipv6-interface-addresses
|      |           |  +--ro state
|      |           |     +--ro address*   inet:ipv6-address
|      |           +--ro ipv4-te-router-id
|      |           |  +--ro state
|      |           |     +--ro router-id*   inet:ipv4-address
|      |           +--ro ipv6-te-router-id
|      |           |  +--ro state
|      |           |     +--ro router-id*   inet:ipv6-address
|      |           +--ro is-reachability
|      |           |  +--ro neighbors
|      |           |     +--ro neighbor* [system-id]
|      |           |        +--ro system-id         -> ../state/system-id
|      |           |        +--ro state
|      |           |        |  +--ro system-id?   oc-isis-types:system-id
|      |           |        +--ro default-metric
|      |           |           +--ro state
|      |           |              +--ro metric?   uint8
|      |           +--ro ipv4-internal-reachability
|      |           |  +--ro prefixes
|      |           |     +--ro prefix* [prefix]
|      |           |        +--ro prefix            -> ../state/prefix
|      |           |        +--ro state
|      |           |        |  +--ro prefix?   inet:ipv4-prefix
|      |           |        +--ro default-metric
|      |           |           +--ro state
|      |           |              +--ro metric?   uint8
|      |           +--ro ipv4-external-reachability
|      |           |  +--ro prefixes
|      |           |     +--ro prefix* [prefix]
|      |           |        +--ro prefix            -> ../state/prefix
|      |           |        +--ro state
|      |           |        |  +--ro prefix?   inet:ipv4-prefix
|      |           |        +--ro default-metric
|      |           |           +--ro state
|      |           |              +--ro metric?   uint8
|      |           +--ro extended-ipv4-reachability
```

```
|      |           |  +--ro prefixes
|      |           |     +--ro prefix* [prefix]
|      |           |        +--ro prefix     -> ../state/prefix
|      |           |        +--ro state
|      |           |        |  +--ro prefix?   inet:ipv4-prefix
|      |           |        |  +--ro metric?   oc-isis-types:wide-metric
|      |           |        +--ro subtlvs
|      |           |           +--ro subtlv* [type]
|      |           |              +--ro type           -> ../state/type
|      |           |              +--ro state
|      |           |              |  +--ro type?   identityref
|      |           |              +--ro tag
|      |           |              |  +--ro state
|      |           |              |     +--ro tag32*   uint32
|      |           |              +--ro prefix-sids
|      |           |                 +--ro prefix-sid* [value]
|      |           |                   +--ro value    -> ../state/value
|      |           |                    +--ro state
|      |           |                       +--ro value?   uint32
|      |           |                       +--ro flags*   enumeration
|      |           +--ro ipv6-reachability
|      |              +--ro prefixes
|      |                 +--ro prefix* [prefix]
|      |                    +--ro prefix     -> ../state/prefix
|      |                    +--ro state
|      |                    |  +--ro up-down?   boolean
|      |                    |  +--ro prefix?    inet:ipv6-prefix
|      |                    |  +--ro metric?    oc-isis-types:wide-metric
|      |                    +--ro subtlvs
|      |                       +--ro subtlv* [type]
|      |                          +--ro type     -> ../state/type
|      |                          +--ro state
|      |                          |  +--ro type?   identityref
|      |                          +--ro tag
|      |                             +--ro state
|      |                                +--ro tag32*   uint32
|      +--rw traffic-engineering
|      |  +--rw config
|      |  |  +--rw enabled?          boolean
|      |  |  +--rw ipv4-router-id?   openconfig-inet-types:ipv4-address
|      |  |  +--rw ipv6-router-id?   openconfig-inet-types:ipv6-address
|      |  +--ro state
|      |     +--ro enabled?          boolean
|      |     +--ro ipv4-router-id?   openconfig-inet-types:ipv4-address
|      |     +--ro ipv6-router-id?   openconfig-inet-types:ipv6-address
|      +--rw authentication
|         +--rw config
|         |  +--rw auth-password?   openconfig-types:routing-password
|         +--ro state
|            +--ro auth-password?   openconfig-types:routing-password
```

```
                +--rw interfaces
                   +--rw interface* [interface-id]
                      +--rw interface-id        -> ../config/interface-id
                      +--rw config
                      |  +--rw interface-id?    openconfig-interfaces:interface-id
                      |  +--rw passive?         boolean
                      |  +--rw hello-padding?   oc-isis-types:hello-padding-type
                      |  +--rw circuit-type?    oc-isis-types:circuit-type
                      +--ro state
                      |  +--ro interface-id?    openconfig-interfaces:interface-id
                      |  +--ro passive?         boolean
                      |  +--ro hello-padding?   oc-isis-types:hello-padding-type
                      |  +--ro circuit-type?    oc-isis-types:circuit-type
                      +--rw circuit-counters
                      |  +--ro state
                      |     +--ro adj-changes?                  openconfig-yang-
types:counter32
                      |     +--ro init-fails?                   openconfig-yang-
types:counter32
                      |     +--ro rejected-adj?                 openconfig-yang-
types:counter32
                      |     +--ro id-field-len-mismatches?      openconfig-yang-
types:counter32
                      |     +--ro max-area-address-mismatches?  openconfig-yang-
types:counter32
                      |     +--ro auth-type-fails?              openconfig-yang-
types:counter32
                      |     +--ro auth-fails?                   openconfig-yang-
types:counter32
                      |     +--ro lan-dis-changes?              openconfig-yang-
types:counter32
                      |     +--ro adj-number?                   uint32
                      +--rw afi-safi
                      |  +--rw af* [afi-name safi-name]
                      |     +--rw afi-name     -> ../config/afi-name
                      |     +--rw safi-name    -> ../config/safi-name
                      |     +--rw config
                      |     |  +--rw afi-name?    identityref
                      |     |  +--rw safi-name?   identityref
                      |     +--ro state
                      |        +--ro afi-name?    identityref
                      |        +--ro safi-name?   identityref
                      +--rw levels
                      |  +--rw level* [level-number]
                      |     +--rw level-number            -> ../config/level-number
                      |     +--rw config
                      |     |  +--rw level-number?   oc-isis-types:level-number
                      |     |  +--rw priority?       uint8
                      |     +--ro state
                      |     |  +--ro level-number?   oc-isis-types:level-number
                      |     |  +--ro priority?       uint8
                      |     +--rw packet-counters
```

```
                        |     |  +--rw lsp
                        |     |  |  +--ro state
                        |     |  |     +--ro received?   openconfig-yang-types:counter32
                        |     |  |     +--ro sent?       openconfig-yang-types:counter32
                        |     |  +--rw ish
                        |     |  |  +--ro state
                        |     |  |     +--ro received?   openconfig-yang-types:counter32
                        |     |  |     +--ro sent?       openconfig-yang-types:counter32
                        |     |  +--rw psnp
                        |     |  |  +--ro state
                        |     |  |     +--ro received?   openconfig-yang-types:counter32
                        |     |  |     +--ro sent?       openconfig-yang-types:counter32
                        |     |  +--rw csnp
                        |     |  |  +--ro state
                        |     |  |     +--ro received?   openconfig-yang-types:counter32
                        |     |  |     +--ro sent?       openconfig-yang-types:counter32
                        |     |  +--rw unknown
                        |     |     +--ro state
                        |     |        +--ro received?   openconfig-yang-types:counter32
                        |     |        +--ro sent?       openconfig-yang-types:counter32
                        |     +--rw timers
                        |     |  +--rw config
                        |     |  |  +--rw hello-interval?     uint32
                        |     |  |  +--rw hello-multiplier?   uint8
                        |     |  +--ro state
                        |     |     +--ro hello-interval?     uint32
                        |     |     +--ro hello-multiplier?   uint8
                        |     +--rw hello-authentication
                        |        +--rw config
                        |        |  +--rw auth-password?   openconfig-types:routing-
password
                        |        +--ro state
                        |           +--ro auth-password?   openconfig-types:routing-
password
                        +--rw weighted-ecmp
                        |  +--rw config
                        |  |  +--rw load-balancing-weight?   union
                        |  +--ro state
                        |     +--ro load-balancing-weight?   union
                        +--rw enable-bfd
                        |  +--rw config
                        |  |  +--rw enabled?                        boolean
                        |  |  +--rw desired-minimum-tx-interval?   uint32
                        |  |  +--rw required-minimum-receive?      uint32
                        |  |  +--rw detection-multiplier?          uint8
                        |  +--ro state
                        |     +--ro enabled?                        boolean
                        |     +--ro desired-minimum-tx-interval?   uint32
                        |     +--ro required-minimum-receive?      uint32
                        |     +--ro detection-multiplier?          uint8
                        +--rw graceful-restart
```

```
                        |  +--rw config
                        |  |  +--rw interface-timer?              uint16
                        |  |  +--rw interface-time-expirations?   int64
                        |  +--ro state
                        |     +--ro interface-timer?              uint16
                        |     +--ro interface-time-expirations?   int64
                        +--rw mpls
                        |  +--rw igp-ldp-sync
                        |     +--rw config
                        |     |  +--rw enabled?   boolean
                        |     +--ro state
                        |        +--ro enabled?   boolean
                        +--rw interface-ref
                           +--rw config
                           |  +--rw interface?      -> /openconfig-interfaces:interfaces/
interface/name
                           |  +--rw subinterface?   -> /openconfig-interfaces:interfaces/
interface[oc-if:name=current()/../interface]/subinterfaces/subinterface/index
                           +--ro state
                              +--ro interface?      -> /openconfig-interfaces:interfaces/
interface/name
                              +--ro subinterface?   -> /openconfig-interfaces:interfaces/
interface[oc-if:name=current()/../interface]/subinterfaces/subinterface/index
```

openconfig-platform

```
  +--rw components
     +--rw component* [name]
        +--rw name                              -> ../config/name
        +--rw config
        |  +--rw name?   string
        +--ro state
        |  +--ro name?                          string
        |  +--ro type?                          union
        |  +--ro id?                            string
        |  +--ro install-position?              string
        |  +--ro install-component?             -> ../name
        |  +--ro description?                   string
        |  +--ro mfg-name?                      string
        |  +--ro mfg-date?                      openconfig-yang-types:date
        |  +--ro hardware-version?              string
        |  +--ro firmware-version?              string
        |  +--ro software-version?              string
        |  +--ro serial-no?                     string
        |  +--ro part-no?                       string
        |  +--ro model-name?                    string
        |  +--ro clei-code?                     string
        |  +--ro removable?                     boolean
        |  +--ro oper-status?                   identityref
        |  +--ro empty?                         boolean
```

```
        |  +--ro parent?                          -> ../../../component/config/name
        |  +--ro last-poweroff-time?              openconfig-types:timeticks64
        |  +--ro temperature
        |  |  +--ro instant?           decimal64
        |  |  +--ro avg?               decimal64
        |  |  +--ro min?               decimal64
        |  |  +--ro max?               decimal64
        |  |  +--ro interval?          openconfig-types:stat-interval
        |  |  +--ro alarm-status?      boolean
        |  |  +--ro alarm-threshold?   decimal64
        |  |  +--ro alarm-severity?    identityref
        |  +--ro memory
        |  |  +--ro available?   uint64
        |  |  +--ro utilized?    uint64
        |  +--ro allocated-power?                 decimal64
        |  +--ro openconfig-alarms:equipment-failure?   boolean
        +--rw subcomponents
        |  +--ro subcomponent* [name]
        |     +--ro name     -> ../state/name
        |     +--ro state
        |        +--ro name?   -> ../../../../../component/config/name
        +--rw port
        |  +--rw openconfig-platform-port:breakout-mode
        |  |  +--rw openconfig-platform-port:groups
        |  |     +--rw openconfig-platform-port:group* [index]
        |  |        +--rw openconfig-platform-port:index   -> ../config/index
        |  |        +--rw openconfig-platform-port:config
        |  |        |  +--rw openconfig-platform-port:index?   uint8
        |  |        |  +--rw openconfig-platform-port:num-breakouts?   uint8
        |  |        |  +--rw openconfig-platform-port:breakout-speed?   identityref
        |  |        |  +--rw openconfig-platform-port:num-physical-channels?   uint8
        |  |        +--ro openconfig-platform-port:state
        |  |           +--ro openconfig-platform-port:index?   uint8
        |  |           +--ro openconfig-platform-port:num-breakouts?   uint8
        |  |           +--ro openconfig-platform-port:breakout-speed?   identityref
        |  |           +--ro openconfig-platform-port:num-physical-channels?   uint8
        |  +--rw openconfig-transport-line-common:optical-port
        |     +--rw openconfig-transport-line-common:config
        |     |  +--rw openconfig-transport-line-common:admin-state?   openconfig-
transport-types:admin-state-type
        |     +--ro openconfig-transport-line-common:state
        |        +--ro openconfig-transport-line-common:admin-state?   openconfig-
transport-types:admin-state-type
        |       +--ro openconfig-transport-line-common:optical-port-type?   identityref
        +--rw power-supply
        |  +--rw config
        |  +--ro state
        |     +--ro openconfig-platform-psu:enabled?   boolean
        |     +--ro openconfig-platform-psu:capacity?   decimal64
        |     +--ro openconfig-platform-psu:input-current?   decimal64
        |     +--ro openconfig-platform-psu:input-voltage?   decimal64
```

```
        |     +--ro openconfig-platform-psu:output-current?   decimal64
        |     +--ro openconfig-platform-psu:output-voltage?   decimal64
        |     +--ro openconfig-platform-psu:output-power?   decimal64
        +--rw fan
        |  +--ro state
        |     +--ro openconfig-platform-fan:speed?   uint32
        +--rw cpu
        |  +--rw openconfig-platform-cpu:utilization
        |     +--ro openconfig-platform-cpu:state
        |        +--ro openconfig-platform-cpu:instant?   decimal64
        |        +--ro openconfig-platform-cpu:avg?   decimal64
       |       +--ro openconfig-platform-cpu:interval?   openconfig-types:stat-interval
        +--rw openconfig-platform-linecard:linecard
        |  +--rw openconfig-platform-linecard:config
        |  |  +--rw openconfig-platform-linecard:power-admin-state?   oc-platform-
types:component-power-type
        |  +--ro openconfig-platform-linecard:state
        |     +--ro openconfig-platform-linecard:power-admin-state?   oc-platform-
types:component-power-type
        +--rw openconfig-platform-transceiver:transceiver
        |  +--rw openconfig-platform-transceiver:config
        |  |  +--rw openconfig-platform-transceiver:enabled?   boolean
        |  |  +--rw openconfig-platform-transceiver:module-functional-type?
identityref
        |  +--ro openconfig-platform-transceiver:state
        |  |  +--ro openconfig-platform-transceiver:enabled?    boolean
        |  |  +--ro openconfig-platform-transceiver:module-functional-type?
identityref
        |  |  +--ro openconfig-platform-transceiver:present?    enumeration
        |  |  +--ro openconfig-platform-transceiver:form-factor?   identityref
        |  |  +--ro openconfig-platform-transceiver:connector-type?   identityref
        |  |  +--ro openconfig-platform-transceiver:vendor?     string
        |  |  +--ro openconfig-platform-transceiver:vendor-part?   string
        |  |  +--ro openconfig-platform-transceiver:vendor-rev?   string
        |  |  +--ro openconfig-platform-transceiver:ethernet-pmd?   identityref
        |  |  +--ro openconfig-platform-transceiver:sonet-sdh-compliance-code?
identityref
        |  |  +--ro openconfig-platform-transceiver:serial-no?   string
        |  |  +--ro openconfig-platform-transceiver:date-code?   string
        |  |  +--ro openconfig-platform-transceiver:supply-voltage
        |  |  |  +--ro openconfig-platform-transceiver:instant?   decimal64
        |  |  +--ro openconfig-platform-transceiver:output-power
        |  |  |  +--ro openconfig-platform-transceiver:instant?   decimal64
        |  |  +--ro openconfig-platform-transceiver:input-power
        |  |  |  +--ro openconfig-platform-transceiver:instant?   decimal64
        |  |  +--ro openconfig-platform-transceiver:laser-bias-current
        |  |     +--ro openconfig-platform-transceiver:instant?   decimal64
        |  +--rw openconfig-platform-transceiver:physical-channels
        |  |  +--rw openconfig-platform-transceiver:channel* [index]
        |  |     +--rw openconfig-platform-transceiver:index   -> ../config/index
        |  |     +--rw openconfig-platform-transceiver:config
```

```
        |  |     |  +--rw openconfig-platform-transceiver:index?   uint16
        |  |     |  +--rw openconfig-platform-transceiver:target-output-power?
decimal64
        |  |     +--ro openconfig-platform-transceiver:state
        |  |        +--ro openconfig-platform-transceiver:index?       uint16
        |  |        +--ro openconfig-platform-transceiver:target-output-power?
decimal64
        |  |        +--ro openconfig-platform-transceiver:laser-age?   decimal64
        |  |        +--ro openconfig-platform-transceiver:laser-temperature
        |  |        |  +--ro openconfig-platform-transceiver:instant?   decimal64
        |  |        +--ro openconfig-platform-transceiver:target-frequency-deviation
        |  |        |  +--ro openconfig-platform-transceiver:instant?   decimal64
        |  |        +--ro openconfig-platform-transceiver:output-frequency?   decimal64
        |  |        +--ro openconfig-platform-transceiver:output-power
        |  |        |  +--ro openconfig-platform-transceiver:instant?   decimal64
        |  |        +--ro openconfig-platform-transceiver:input-power
        |  |        |  +--ro openconfig-platform-transceiver:instant?   decimal64
        |  |        +--ro openconfig-platform-transceiver:laser-bias-current
        |  |           +--ro openconfig-platform-transceiver:instant?   decimal64
        |  +--rw openconfig-platform-transceiver:thresholds
        |     +--ro openconfig-platform-transceiver:threshold* [severity]
        |        +--ro openconfig-platform-transceiver:severity   -> ../state/severity
        |        +--ro openconfig-platform-transceiver:state
        |           +--ro openconfig-platform-transceiver:severity?   identityref
        |           +--ro openconfig-platform-transceiver:input-power-upper?   decimal64
        |           +--ro openconfig-platform-transceiver:input-power-lower?   decimal64
        |           +--ro openconfig-platform-transceiver:laser-bias-current-upper?
decimal64
        |           +--ro openconfig-platform-transceiver:laser-bias-current-lower?
decimal64
        |           +--ro openconfig-platform-transceiver:supply-voltage-upper?
decimal64
        |           +--ro openconfig-platform-transceiver:supply-voltage-lower?
decimal64
        |           +--ro openconfig-platform-transceiver:module-temperature-lower?
decimal64
        |           +--ro openconfig-platform-transceiver:module-temperature-upper?
decimal64
        +--rw openconfig-terminal-device:optical-channel
           +--rw openconfig-terminal-device:config
           |  +--rw openconfig-terminal-device:frequency?   uint64
           |  +--rw openconfig-terminal-device:target-output-power?   decimal64
           |  +--rw openconfig-terminal-device:operational-mode?   uint16
           +--ro openconfig-terminal-device:state
              +--ro openconfig-terminal-device:frequency?                    openconfig-
transport-types:frequency-type
              +--ro openconfig-terminal-device:target-output-power?          decimal64
              +--ro openconfig-terminal-device:operational-mode?             uint16
              +--ro openconfig-terminal-device:line-port?                    -> /
openconfig-platform:components/component/name
              +--ro openconfig-terminal-device:output-power
              |  +--ro openconfig-terminal-device:instant?   decimal64
              +--ro openconfig-terminal-device:input-power
```

```
 |  +--ro openconfig-terminal-device:instant?   decimal64
 +--ro openconfig-terminal-device:laser-bias-current
 |  +--ro openconfig-terminal-device:instant?   decimal64
 +--ro openconfig-terminal-device:chromatic-dispersion
 |  +--ro openconfig-terminal-device:instant?   decimal64
 |  +--ro openconfig-terminal-device:min?   decimal64
 |  +--ro openconfig-terminal-device:max?   decimal64
 +--ro openconfig-terminal-device:polarization-mode-dispersion
 |  +--ro openconfig-terminal-device:instant?   decimal64
 |  +--ro openconfig-terminal-device:avg?   decimal64
 |  +--ro openconfig-terminal-device:min?   decimal64
 |  +--ro openconfig-terminal-device:max?   decimal64
+--ro openconfig-terminal-device:second-order-polarization-mode-dispersion
 |  +--ro openconfig-terminal-device:instant?   decimal64
 |  +--ro openconfig-terminal-device:avg?   decimal64
 |  +--ro openconfig-terminal-device:min?   decimal64
 |  +--ro openconfig-terminal-device:max?   decimal64
 +--ro openconfig-terminal-device:polarization-dependent-loss
 |  +--ro openconfig-terminal-device:instant?   decimal64
 |  +--ro openconfig-terminal-device:avg?   decimal64
 |  +--ro openconfig-terminal-device:min?   decimal64
 |  +--ro openconfig-terminal-device:max?   decimal64
 +--ro openconfig-terminal-device:modulator-bias-xi
 |  +--ro openconfig-terminal-device:instant?   decimal64
 +--ro openconfig-terminal-device:modulator-bias-xq
 |  +--ro openconfig-terminal-device:instant?   decimal64
 +--ro openconfig-terminal-device:modulator-bias-yi
 |  +--ro openconfig-terminal-device:instant?   decimal64
 +--ro openconfig-terminal-device:modulator-bias-yq
 |  +--ro openconfig-terminal-device:instant?   decimal64
 +--ro openconfig-terminal-device:modulator-bias-x-phase
 |  +--ro openconfig-terminal-device:instant?   decimal64
 +--ro openconfig-terminal-device:modulator-bias-y-phase
 |  +--ro openconfig-terminal-device:instant?   decimal64
 +--ro openconfig-terminal-device:osnr
 |  +--ro openconfig-terminal-device:instant?   decimal64
 |  +--ro openconfig-terminal-device:avg?   decimal64
 |  +--ro openconfig-terminal-device:min?   decimal64
 |  +--ro openconfig-terminal-device:max?   decimal64
 +--ro openconfig-terminal-device:carrier-frequency-offset
 |  +--ro openconfig-terminal-device:instant?   decimal64
 |  +--ro openconfig-terminal-device:avg?   decimal64
 |  +--ro openconfig-terminal-device:min?   decimal64
 |  +--ro openconfig-terminal-device:max?   decimal64
 +--ro openconfig-terminal-device:sop-roc
 |  +--ro openconfig-terminal-device:instant?   decimal64
 |  +--ro openconfig-terminal-device:avg?   decimal64
 |  +--ro openconfig-terminal-device:min?   decimal64
 |  +--ro openconfig-terminal-device:max?   decimal64
 +--ro openconfig-terminal-device:modulation-error-ratio
```

```
              |  +--ro openconfig-terminal-device:instant?   decimal64
              |  +--ro openconfig-terminal-device:avg?   decimal64
              |  +--ro openconfig-terminal-device:min?   decimal64
              |  +--ro openconfig-terminal-device:max?   decimal64
              +--ro openconfig-terminal-device:fec-uncorrectable-blocks?     ietf-yang-
types:counter64
              +--ro openconfig-terminal-device:pre-fec-ber
              |  +--ro openconfig-terminal-device:instant?   decimal64
              |  +--ro openconfig-terminal-device:avg?   decimal64
              |  +--ro openconfig-terminal-device:min?   decimal64
              |  +--ro openconfig-terminal-device:max?   decimal64
              +--ro openconfig-terminal-device:post-fec-ber
              |  +--ro openconfig-terminal-device:instant?   decimal64
              |  +--ro openconfig-terminal-device:avg?   decimal64
              |  +--ro openconfig-terminal-device:min?   decimal64
              |  +--ro openconfig-terminal-device:max?   decimal64
              +--ro openconfig-terminal-device:esnr
                 +--ro openconfig-terminal-device:instant?   decimal64
                 +--ro openconfig-terminal-device:avg?   decimal64
                 +--ro openconfig-terminal-device:min?   decimal64
                 +--ro openconfig-terminal-device:max?   decimal64
```

openconfig-qos

```
  +--rw qos
     +--rw config
     |  +--rw ipi-oc-qos-deviations:ipi-qos-enabled?   boolean
     +--ro state
     |  +--ro ipi-oc-qos-deviations:ipi-qos-enabled?   boolean
     +--rw interfaces
     |  +--rw interface* [interface-id]
     |     +--rw interface-id     -> ../config/interface-id
     |     +--rw config
     |     |  +--rw interface-id?   string
     |     +--ro state
     |     |  +--ro interface-id?   string
     |     +--rw interface-ref
     |     |  +--rw config
     |     |  |  +--rw interface?      -> /oc-if:interfaces/interface/name
     |     |  |  +--rw subinterface?   -> /oc-if:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
     |     |  +--ro state
     |     |     +--ro interface?      -> /oc-if:interfaces/interface/name
     |     |     +--ro subinterface?   -> /oc-if:interfaces/interface[oc-
if:name=current()/../interface]/subinterfaces/subinterface/index
     |     +--rw input
     |     |  +--rw classifiers
     |     |     +--rw classifier* [type]
     |     |        +--rw type      -> ../config/type
     |     |        +--rw config
```

```
     |     |        |  +--rw name?   -> ../../../../../../../classifiers/classifier/
config/name
     |     |        |  +--rw type?   enumeration
     |     |        +--ro state
     |     |        |  +--ro name?   -> ../../../../../../../classifiers/classifier/
config/name
     |     |        |  +--ro type?   enumeration
     |     |        +--rw terms
     |     |           +--ro term* [id]
     |     |              +--ro id       -> ../state/id
     |     |              +--ro state
     |     |                 +--ro id?                -> ../../../../../../../../../../
classifiers/classifier[name=current()/../../../../config/name]/terms/term/config/id
     |     |                 +--ro matched-packets?   oc-yang:counter64
     |     |                 +--ro matched-octets?    oc-yang:counter64
     |     +--rw output
     |        +--rw scheduler-policy
     |           +--rw config
     |           |  +--rw name?   -> ../../../../../../scheduler-policies/scheduler-
policy/config/name
     |           +--ro state
     |           |  +--ro name?   -> ../../../../../../scheduler-policies/scheduler-
policy/config/name
     |           +--ro schedulers
     |              +--ro scheduler* [sequence]
     |                 +--ro sequence    -> ../state/sequence
     |                 +--ro state
     |                  +--ro sequence?           -> ../../../../../../../../../scheduler-
policies/scheduler-policy[name=current()/../../../../config/name]/schedulers/scheduler/
config/sequence
     |                    +--ro conforming-pkts?     oc-yang:counter64
     |                    +--ro conforming-octets?   oc-yang:counter64
     |                    +--ro exceeding-pkts?      oc-yang:counter64
     |                    +--ro exceeding-octets?    oc-yang:counter64
     +--rw classifiers
     |  +--rw classifier* [name]
     |     +--rw name      -> ../config/name
     |     +--rw config
     |     |  +--rw name?   string
     |     |  +--rw type?   enumeration
     |     +--ro state
     |     |  +--ro name?   string
     |     |  +--ro type?   enumeration
     |     +--rw terms
     |        +--rw term* [id]
     |           +--rw id            -> ../config/id
     |           +--rw config
     |           |  +--rw id?   string
     |           +--ro state
     |           |  +--ro id?   string
     |           +--rw conditions
     |           |  +--rw ipv4
```

```
     |           |     +--rw config
     |           |     |  +--rw source-address?        oc-inet:ipv4-prefix
     |           |     |  +--rw destination-address?   oc-inet:ipv4-prefix
     |           |     |  +--rw dscp?                  oc-inet:dscp
     |           |     +--ro state
     |           |        +--ro source-address?        oc-inet:ipv4-prefix
     |           |        +--ro destination-address?   oc-inet:ipv4-prefix
     |           |        +--ro dscp?                  oc-inet:dscp
     |           +--rw actions
     |              +--rw config
     |              |  +--rw target-group?   -> ../../../../../../../forwarding-groups/
forwarding-group/config/name
     |              +--ro state
     |                 +--ro target-group?   -> ../../../../../../../forwarding-groups/
forwarding-group/config/name
     +--rw forwarding-groups
     |  +--rw forwarding-group* [name]
     |     +--rw name      -> ../config/name
     |     +--rw config
     |     |  +--rw name?              string
     |     |  +--rw fabric-priority?   uint8
     |     |  +--rw output-queue?      -> ../../../../queues/queue/config/name
     |     +--ro state
     |        +--ro name?              string
     |        +--ro fabric-priority?   uint8
     |        +--ro output-queue?      -> ../../../../queues/queue/config/name
     +--rw queues
     |  +--rw queue* [name]
     |     +--rw name      -> ../config/name
     |     +--rw config
     |     |  +--rw name?       string
     |     |  +--rw queue-id?   uint8
     |     +--ro state
     |        +--ro name?       string
     |        +--ro queue-id?   uint8
     +--rw scheduler-policies
     |  +--rw scheduler-policy* [name]
     |     +--rw name          -> ../config/name
     |     +--rw config
     |     |  +--rw name?   string
     |     +--ro state
     |     |  +--ro name?   string
     |     +--rw schedulers
     |        +--rw scheduler* [sequence]
     |           +--rw sequence              -> ../config/sequence
     |           +--rw config
     |           |  +--rw sequence?   uint32
     |           |  +--rw type?       identityref
     |           |  +--rw priority?   enumeration
     |           +--ro state
     |           |  +--ro sequence?   uint32
```

```
|           |  +--ro type?       identityref
|           |  +--ro priority?   enumeration
|           +--rw inputs
|           |  +--rw input* [id]
|           |     +--rw id        -> ../config/id
|           |     +--rw config
|           |     |  +--rw id?           string
|           |     |  +--rw input-type?   enumeration
|           |     |  +--rw queue         -> ../../../../../../../../queues/queue/name
|           |     |  +--rw weight?       uint64
|           |     +--ro state
|           |        +--ro id?           string
|           |        +--ro input-type?   enumeration
|           |        +--ro queue?        -> ../../../../../../../../queues/queue/name
|           |        +--ro weight?       uint64
|           +--rw one-rate-two-color
|              +--rw config
|              |  +--rw cir?                      uint64
|              |  +--rw queuing-behavior?         oc-qos-types:queue-behavior
|              |  +--rw max-queue-depth-bytes?    uint32
|              +--ro state
|                 +--ro cir?                      uint64
|                 +--ro queuing-behavior?         oc-qos-types:queue-behavior
|                 +--ro max-queue-depth-bytes?    uint32
+--rw queue-management-profiles
   +--rw queue-management-profile* [name]
      +--rw name      -> ../config/name
      +--rw config
      |  +--rw name?   string
      +--ro state
      |  +--ro name?   string
      +--rw wred
         +--rw uniform
            +--rw config
            |  +--rw min-threshold?           uint64
            |  +--rw max-threshold?           uint64
            |  +--rw min-threshold-percent?   uint64
            |  +--rw max-threshold-percent?   uint64
            +--ro state
               +--ro min-threshold?           uint64
               +--ro max-threshold?           uint64
               +--ro min-threshold-percent?   uint64
               +--ro max-threshold-percent?   uint64
```

openconfig-routing-policy

```
+--rw routing-policy
   +--rw defined-sets
   |  +--rw tag-sets
```

```
     |  |  +--rw tag-set* [name]
     |  |     +--rw name      -> ../config/name
     |  |     +--rw config
     |  |     |  +--rw name?        string
     |  |     |  +--rw tag-value*   openconfig-policy-types:tag-type
     |  |     +--ro state
     |  |        +--ro name?        string
     |  |        +--ro tag-value*   openconfig-policy-types:tag-type
     |  +--rw openconfig-bgp-policy:bgp-defined-sets
     |     +--rw openconfig-bgp-policy:ext-community-sets
     |        +--rw openconfig-bgp-policy:ext-community-set* [ext-community-set-name]
     |           +--rw openconfig-bgp-policy:ext-community-set-name   -> ../config/ext-
community-set-name
     |           +--rw openconfig-bgp-policy:config
     |              +--rw openconfig-bgp-policy:ext-community-set-name?   string
     |              +--rw openconfig-bgp-policy:ext-community-member*   union
     |              x--rw openconfig-bgp-policy:match-set-options?   openconfig-policy-
types:match-set-options-type
     +--rw policy-definitions
        +--rw policy-definition* [name]
           +--rw name          -> ../config/name
           +--rw config
           |  +--rw name?   string
           +--ro state
           |  +--ro name?   string
           +--rw statements
              +--rw statement* [name]
                 +--rw name          -> ../config/name
                 +--rw config
                 |  +--rw name?   uint32
                 +--ro state
                 |  +--ro name?   string
                 +--rw conditions
                 |  +--rw config
                 |  +--rw match-tag-set
                 |  |  +--rw config
                 |  |  |  +--rw tag-set?   -> ../../../../../../../../../defined-sets/tag-
sets/tag-set/name
                 |  |  +--ro state
                 |  |     +--ro tag-set?   -> ../../../../../../../../../defined-sets/tag-
sets/tag-set/name
                 |  +--rw openconfig-bgp-policy:bgp-conditions
                 |     +--rw openconfig-bgp-policy:config
                 |     |  x--rw openconfig-bgp-policy:ext-community-set?   -> /
openconfig-routing-policy:routing-policy/defined-sets/openconfig-bgp-policy:bgp-
defined-sets/ext-community-sets/ext-community-set/ext-community-set-name
                 |     +--ro openconfig-bgp-policy:state
                 |     |  x--ro openconfig-bgp-policy:ext-community-set?   -> /
openconfig-routing-policy:routing-policy/defined-sets/openconfig-bgp-policy:bgp-
defined-sets/ext-community-sets/ext-community-set/ext-community-set-name
                 |     +--rw openconfig-bgp-policy:match-ext-community-set
                 |        +--rw openconfig-bgp-policy:config
```

```
                  |        |  +--rw openconfig-bgp-policy:ext-community-set?   -> /
openconfig-routing-policy:routing-policy/defined-sets/openconfig-bgp-policy:bgp-
defined-sets/ext-community-sets/ext-community-set/ext-community-set-name
                  |        |  +--rw openconfig-bgp-policy:match-set-options?   openconfig-
policy-types:match-set-options-type
                  |        +--ro openconfig-bgp-policy:state
                  |           +--ro openconfig-bgp-policy:ext-community-set?   -> /
openconfig-routing-policy:routing-policy/defined-sets/openconfig-bgp-policy:bgp-
defined-sets/ext-community-sets/ext-community-set/ext-community-set-name
                  |           +--ro openconfig-bgp-policy:match-set-options?   openconfig-
policy-types:match-set-options-type
                  +--rw actions
                     +--rw config
                     |  +--rw policy-result?   policy-result-type
                     +--ro state
                     |  +--ro policy-result?   policy-result-type
                     +--rw openconfig-bgp-policy:bgp-actions
                        +--rw openconfig-bgp-policy:config
                        |  +--rw openconfig-bgp-policy:set-route-origin?   openconfig-bgp-
types:bgp-origin-attr-type
                        |  +--rw openconfig-bgp-policy:set-local-pref?   uint32
                        +--ro openconfig-bgp-policy:state
                           +--ro openconfig-bgp-policy:set-route-origin?   openconfig-bgp-
types:bgp-origin-attr-type
                           +--ro openconfig-bgp-policy:set-local-pref?   uint32
```

openconfig-system

```
  +--rw system
     +--rw config
     |  +--rw hostname?   openconfig-inet-types:domain-name
     +--ro state
     |  +--ro hostname?           openconfig-inet-types:domain-name
     |  +--ro current-datetime?   string
     |  +--ro up-time?            openconfig-types:timeticks64
     |  +--ro boot-time?          openconfig-types:timeticks64
     +--ro alarms
     |  +--ro alarm* [id]
     |     +--ro id        -> ../state/id
     |     +--ro config
     |     +--ro state
     |        +--ro id?                                                  string
     |        +--ro resource?                                            string
     |        +--ro text?                                                string
     |        +--ro time-created?                                        openconfig-
types:timeticks64
     |        +--ro severity?                                            identityref
     |        +--ro type-id?                                             union
     |        +--ro ipi-oc-sys-deviations:alarm-reported-timestamp?   string
     +--rw logging
     |  +--rw remote-servers
```

```
|  |  +--rw remote-server* [host]
|  |     +--rw host         -> ../config/host
|  |     +--rw config
|  |     |  +--rw host?               openconfig-inet-types:host
|  |     |  +--rw network-instance?   oc-ni:network-instance-ref
|  |     |  +--rw remote-port?        openconfig-inet-types:port-number
|  |     +--ro state
|  |     |  +--ro host?               openconfig-inet-types:host
|  |     |  +--ro network-instance?   oc-ni:network-instance-ref
|  |     |  +--ro remote-port?        openconfig-inet-types:port-number
|  |     +--rw selectors
|  |        +--rw selector* [facility severity]
|  |           +--rw facility    -> ../config/facility
|  |           +--rw severity    -> ../config/severity
|  |           +--rw config
|  |           |  +--rw facility?   identityref
|  |           |  +--rw severity?   syslog-severity
|  |           +--ro state
|  |              +--ro facility?   identityref
|  |              +--ro severity?   syslog-severity
|  +--rw files
|  |  +--rw file* [path filename-prefix]
|  |     +--rw filename-prefix    -> ../config/filename-prefix
|  |     +--rw path               -> ../config/path
|  |     +--rw config
|  |     |  +--rw filename-prefix?   string
|  |     |  +--rw path?              string
|  |     |  +--rw rotate?            uint32
|  |     |  +--rw max-size?          uint32
|  |     |  +--rw max-open-time?     uint32
|  |     +--ro state
|  |     |  +--ro filename-prefix?   string
|  |     |  +--ro path?              string
|  |     |  +--ro rotate?            uint32
|  |     |  +--ro max-size?          uint32
|  |     |  +--ro max-open-time?     uint32
|  |     |  +--ro open-logfile?      string
|  |     +--rw selectors
|  |        +--rw selector* [facility severity]
|  |           +--rw facility    -> ../config/facility
|  |           +--rw severity    -> ../config/severity
|  |           +--rw config
|  |           |  +--rw facility?   identityref
|  |           |  +--rw severity?   syslog-severity
|  |           +--ro state
|  |              +--ro facility?   identityref
|  |              +--ro severity?   syslog-severity
|  +--rw vty
|     +--rw config
|     +--ro state
```

```
   |     +--rw selectors
   |        +--rw selector* [facility severity]
   |           +--rw facility    -> ../config/facility
   |           +--rw severity    -> ../config/severity
   |           +--rw config
   |           |  +--rw facility?   identityref
   |           |  +--rw severity?   syslog-severity
   |           +--ro state
   |              +--ro facility?   identityref
   |              +--ro severity?   syslog-severity
   +--rw clock
      +--rw config
      |  +--rw timezone-name?   timezone-name-type
      +--ro state
         +--ro timezone-name?   timezone-name-type
```

openconfig-terminal-device

```
+--rw terminal-device
   +--rw config
   +--rw logical-channels
   |  +--rw channel* [index]
   |     +--rw index                          -> ../config/index
   |     +--rw config
   |     |  +--rw index?                  uint32
   |     |  +--rw admin-state?            openconfig-transport-types:admin-state-type
   |     |  +--rw logical-channel-type?   identityref
   |     |  +--rw loopback-mode?          openconfig-transport-types:loopback-mode-type
   |     +--ro state
   |     |  +--ro index?                  uint32
   |     |  +--ro description?            string
   |     |  +--ro admin-state?            openconfig-transport-types:admin-state-type
   |     |  +--ro rate-class?             identityref
   |     |  +--ro trib-protocol?          identityref
   |     |  +--ro logical-channel-type?   identityref
   |     |  +--ro loopback-mode?          openconfig-transport-types:loopback-mode-type
   |     |  +--ro test-signal?            boolean
   |     +--rw otn
   |     |  +--ro state
   |     |     +--ro errored-blocks?             ietf-yang-types:counter64
   |     |     +--ro fec-uncorrectable-blocks?   ietf-yang-types:counter64
   |     |     +--ro pre-fec-ber
   |     |     |  +--ro instant?   uint64
   |     |     +--ro post-fec-ber
   |     |     |  +--ro instant?   uint64
   |     |     +--ro q-value
   |     |        +--ro instant?   decimal64
   |     +--rw ethernet
   |     |  +--ro state
```

```
     |     |     +--ro in-block-errors?            openconfig-yang-types:counter64
     |     |     +--ro out-8021q-frames?           openconfig-yang-types:counter64
     |     |     +--ro in-pcs-bip-errors?          openconfig-yang-types:counter64
     |     |     +--ro out-pcs-bip-errors?         openconfig-yang-types:counter64
     |     |     +--ro out-block-errors?           openconfig-yang-types:counter64
     |     |     +--ro fec-uncorrectable-blocks?   ietf-yang-types:counter64
     |     |     +--ro pre-fec-ber
     |     |     |  +--ro instant?   decimal64
     |     |     |  +--ro avg?       decimal64
     |     |     |  +--ro min?       decimal64
     |     |     |  +--ro max?       decimal64
     |     |     +--ro post-fec-ber
     |     |     |  +--ro instant?   decimal64
     |     |     |  +--ro avg?       decimal64
     |     |     |  +--ro min?       decimal64
     |     |     |  +--ro max?       decimal64
     |     |     +--ro q-value
     |     |     |  +--ro instant?   decimal64
     |     |     +--ro esnr
     |     |        +--ro instant?   decimal64
     |     +--rw ingress
     |     |  +--ro state
     |     |     +--ro transceiver?   -> /openconfig-platform:components/component/name
     |     |     +--ro interface?     openconfig-interfaces:base-interface-ref
     |     +--rw logical-channel-assignments
     |        +--rw assignment* [index]
     |           +--rw index     -> ../config/index
     |           +--rw config
     |           |  +--rw index?   uint32
     |           +--ro state
     |              +--ro index?             uint32
     |              +--ro assignment-type?   enumeration
     |              +--ro logical-channel?   -> /terminal-device/logical-channels/
channel/index
     |              +--ro optical-channel?   -> /openconfig-platform:components/
component/name
     |              +--ro allocation?        decimal64
     +--rw operational-modes
        +--ro mode* [mode-id]
           +--ro mode-id    -> ../state/mode-id
           +--ro state
              +--ro mode-id?       uint16
              +--ro description?   string
              +--ro vendor-id?     string
```

openconfig-terminal-device-properties

```
  +--ro operational-modes
     +--ro mode-descriptor* [mode-id]
        +--ro mode-id          -> ../state/mode-id
```

```
        +--ro state
        |  +--ro mode-id?     uint16
        |  +--ro mode-type?   identityref
        +--ro explicit-mode
           +--ro operational-mode-capabilities
           |  +--ro state
           |     +--ro modulation-format?   union
           |     +--ro bit-rate?            openconfig-terminal-device-property-
types:bit-rate
           |     +--ro baud-rate?           decimal64
           +--ro optical-channel-config-value-constraints
              +--ro state
                 +--ro min-central-frequency?    openconfig-transport-types:frequency-
type
                 +--ro max-central-frequency?    openconfig-transport-types:frequency-
type
                 +--ro adjustment-granularity?   openconfig-terminal-device-property-
types:adjustment-granularity
                 +--ro min-output-power?         decimal64
                 +--ro max-output-power?         decimal64
```

ipi-oc-if-deviations

```
  augment /oc-if:interfaces/oc-if:interface/oc-eth:ethernet/oc-eth:config:
    +--rw lacp-mode?   openconfig-lacp:lacp-activity-type
  augment /oc-if:interfaces/oc-if:interface/oc-eth:ethernet/oc-eth:state:
    +--ro lacp-mode?   openconfig-lacp:lacp-activity-type
  augment /oc-if:interfaces/oc-if:interface/oc-eth:ethernet/oc-eth:config:
    x--rw load-interval?   uint16
  augment /oc-if:interfaces/oc-if:interface/oc-eth:ethernet/oc-eth:state:
    x--ro load-interval?   uint16
```