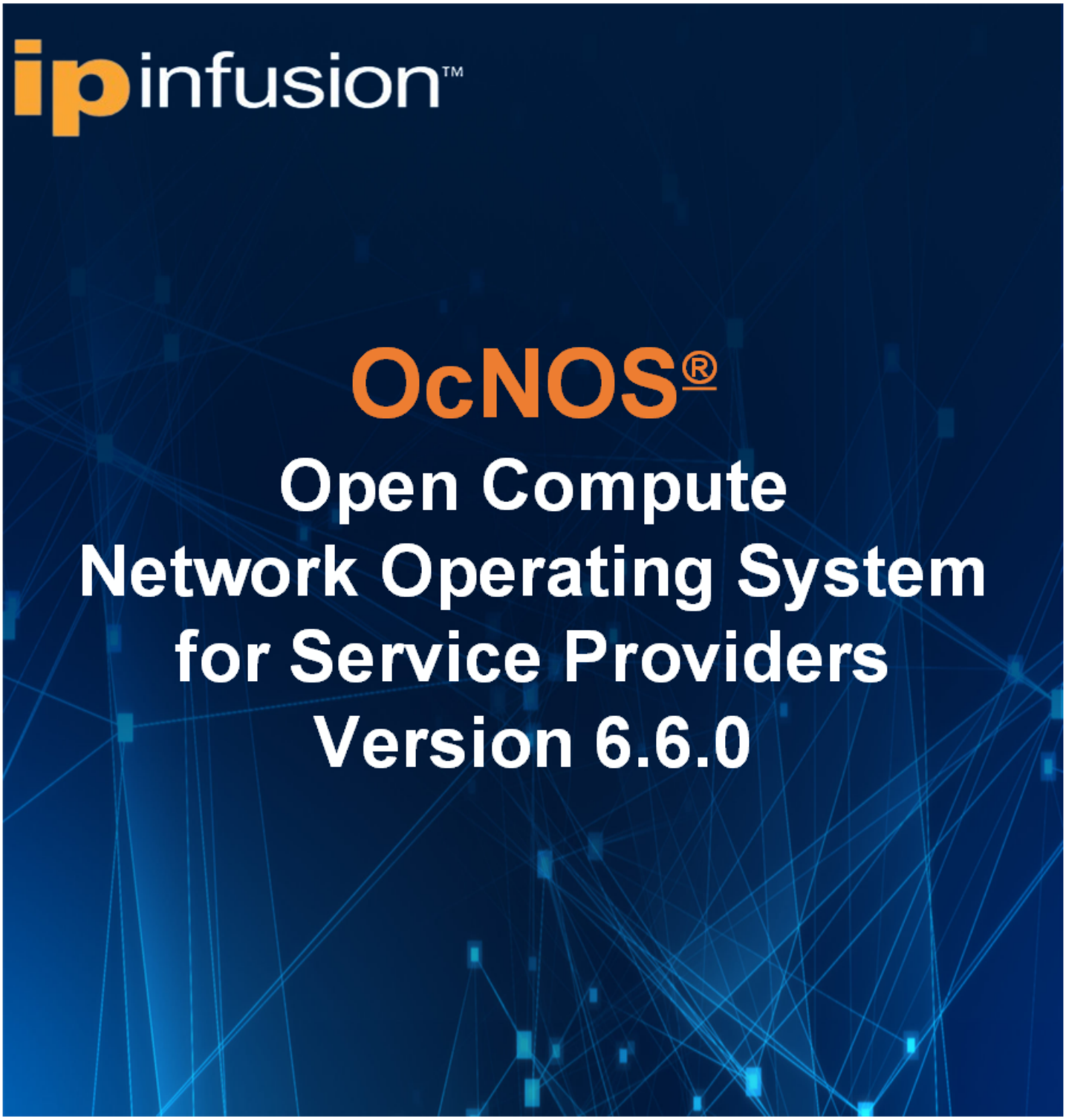

Timing and Synchronization Guide

February 2025

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Contents

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 7 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.

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.

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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 11 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>}`

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 12 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 13 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 13 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

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 17 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.

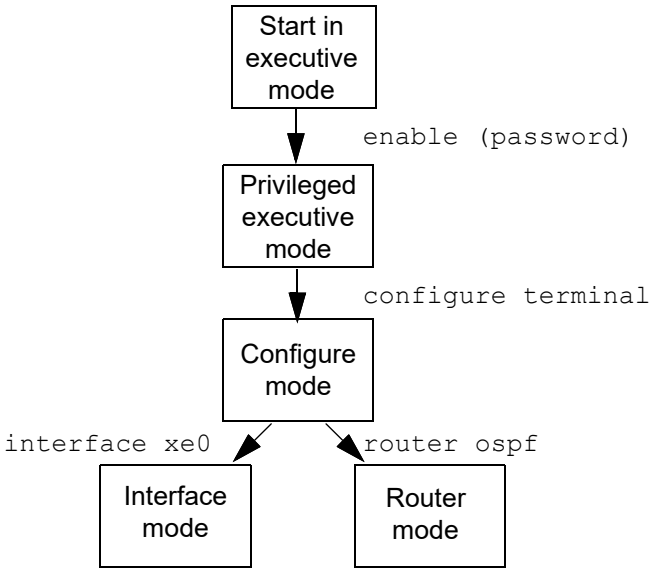


Figure P-1: Common command modes

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.

Precision Time Protocol Configuration

CHAPTER 1 Boundary Clock Configuration

This chapter shows how to configure a boundary clock over Ethernet, IPv4, and IPv6. You configure a boundary clock with more than one port.

Note: We can enable PTP on physical interfaces which can be L2, L3 or member port of the LAG.

Topology

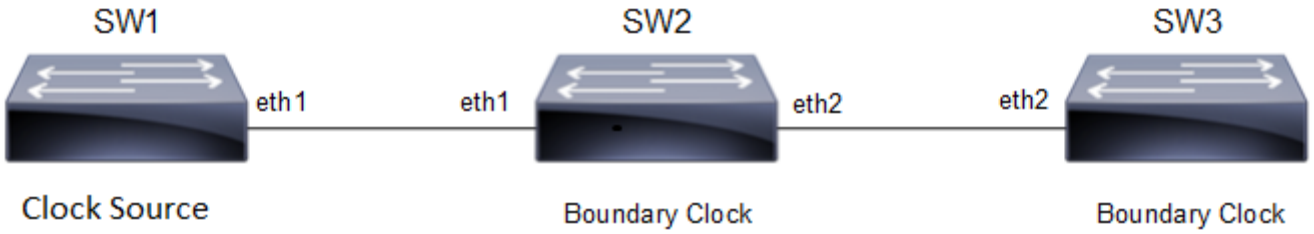


Figure 1-1: Configuration Topology

In this example, SW2 and SW3 are running PTP acting as boundary clock.

Boundary Clock Configuration

This section shows how to set up a boundary clock.

SW2 (boundary clock)

`#configure terminal`	Enter Configure mode
`(config)#bridge 1 protocol mstp`	Create bridge 1 as an MSTP bridge (this step is not mandatory, but is a good practice to avoid layer 2 loops)
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#synchronization option 1`	Set the synchronization network type.
`(config-synce)#exit`	Exit Synce mode
`(config)#interface eth1`	Configure interface eth1
`(config-if)#switchport`	Configure eth1 as Layer 2 port
`(config-if)#bridge-group 1`	Configure eth1 in bridge group 1
`(config-if)#synce`	Enter interface Synchronous Ethernet mode.
`(config-if-synce)#mode synchronous`	Configure synchronous mode.
`(config-if-synce)#input-source 2`	Configure the interface as an input source with priority 2.
`(config-if-synce)#exit`	Exit Port Configure mode
`(conig-if)#exit`	Exit Interface mode
`(config)#interface eth2`	Configure interface eth2
`(config-if)#switchport`	Configure eth2 as Layer 2 port
`(config-if)#bridge-group 1`	Configure eth2 in bridge group 1
`(config-if)#synce`	Enter interface Synchronous Ethernet mode.

(config-if-synce)#mode synchronous	Configure synchronous mode.
(config-if-synce)#output-source	Configure the interface as an output source.
(config-if-synce)#exit	Exit Port Configure mode
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8275.1	Enables G8275.1 for PTP time/phase telecom profile
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 2	Configure ptp port
(config-clk-port)#network-interface xe2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 1	Configure ptp port
(config-clk-port)#network-interface xe1	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

SW3 (Boundary clock)

#configure terminal	Enter Configure mode
(config)#bridge 1 protocol mstp	Create bridge 1 as an MSTP bridge (this step is not mandatory, but is a good practice to avoid layer 2 loops)
(config)#synce	Enter configure Synchronous Ethernet mode.
(config-synce)#synchronization option 1	Set the synchronization network type.
(config-synce)#exit	Exit Synce mode
(config)#interface eth2	Configure interface eth2
(config-if)#switchport	Configure eth2 as Layer 2 port
(config-if)#bridge-group 1	Configure eth2 in bridge group 1
(config-if)#synce	Enter interface Synchronous Ethernet mode.
(config-if-synce)#mode synchronous	Configure synchronous mode.
(config-if-synce)#input-source 4	Configure the interface as an input source with priority 4.
(config-if-synce)#exit	Exit Port Configure mode
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8275.1	Enables G8275.1 for PTP time/phase telecom profile
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 2	Configure ptp port
(config-clk-port)#network-interface xe2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode
(config-clk-clk)#clock-port 1	Configure ptp port
(config-clk-port)#network-interface xe1	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

Validation

SW2

1. Verify the default data set on SW2.

```
#sh ptp clock 0 dataset
Default Dataset:
Two Step Flag               : No
  Clock Identity              : B8:6A:97:FF:FE:F5:F4:C4
  Number Of Ports             : 2
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 24
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535
```

2. Verify the port state on SW2.

```
#show ptp clock 0 port
Port 1:
  Port State                  : Slave
  Port Identity               : B8:6A:97:FF:FE:F5:F4:C4:00:01
  Log Min Delay Req Interval  : -4
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Announce Receipt Timeout    : 3
  Log Sync Interval           : -4
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : xe1
  Vlan Configured             :
  Description                 :

  Foreign Master #0
  L2 Address                  : e8:c5:7a:79:57:1d
  Grandmaster clockIdentity   : E8:C5:7A:FF:FE:2E:4B:1C
  Port ID                     : E8:C5:7A:FF:FE:2E:4B:1C:00:01
  clockClass                  : 135
  Clock accuracy              : 254
  Offset scaled log variance  : 65535
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 0
  PDV Scaled Allan Variance   : 10

  Received Packets            : 7530
  Discarded Packets           : 4
  Transmitted Packets         : 3018
```

```
    Peer #0
    L2 Address                  : e8:c5:7a:79:57:1d
    Clock Identity              : e8:c5:7a:ff:fe:2e:4b:1c
    Received Announce           : 1021
    Received Sync               : 2042
    Received Delay Response     : 2041
    Transmitted Delay Request   : 2041

  Port 2:
    Port State                  : Master
    Port Identity               : B8:6A:97:FF:FE:F5:F4:C4:00:02
    Log Min Delay Req Interval  : -4
    Peer Mean Path Delay        : 0
    Log Announce Interval       : -3
    Announce Receipt Timeout    : 3
    Log Sync Interval           : -4
    Delay Mechanism             : End to end
    Version Number              : 2
    Local Priority              : 128
    Master only                 : False
    Signal Fail                 : False
    Network Interface           : xe2
    Vlan Configured             :
    Description                 :

    Received Packets            : 0
    Discarded Packets           : 0
    Transmitted Packets         : 113
```

Note: Use `show ptp stats` to collect the PTP statistics and use `clear ptp stats` to clear the same.

CHAPTER 2 PTP G.8265.1 Profile Configuration

This chapter shows how to configure a PTP G.8265.1 profile over IPv4. G.8265.1 profile only supports Ordinary Clock-type (a clock with only one PTP port).

Topology

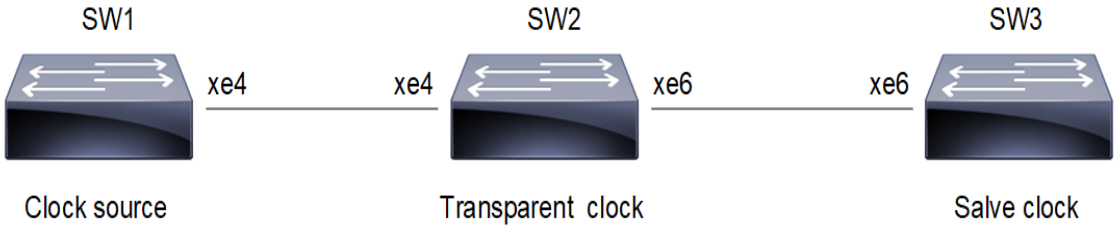


Figure 2-2: Configuration Topology

In this example, SW1, SW2 and SW3 are running PTP. SW1 acting as T-GM, SW2 as a Transparent clock and SW3 as a slave clock.

PTP G.8265.1 Profile Configuration

This section shows how to set up G.8265.1 profile.

SW2 (Transparent clock)

`#configure terminal`	Enter Configure mode
`(config)#bridge 1 protocol mstp`	Create bridge 1 as an MSTP bridge (this step is not mandatory, but is a good practice to avoid layer 2 loops)
`(config)#vlan database`	Create Vlan database
`(config-vlan)#vlan 10 bridge 1`	Configure Vlan 10 associated with bridge1
`(config-vlan)#exit`	Exit Interface mode
`(config)#ptp clock 0 profile e2e-transparent`	Configure Switch as Transparent clock
`(config)#interface xe4`	Configure interface xe4
`(config-if)#switchport`	Configure xe4 as Layer 2 port
`(config-if)#bridge-group 1`	Configure xe4 in bridge group 1
`(config-if)#switchport mode trunk`	Configure mode trunk
`(config-if)#switchport trunk allowed vlan add 10`	Add vlan 10 to the interface xe4
`(conig-if)#exit`	Exit Interface mode
`(config)#interface xe6`	Configure interface xe6
`(config-if)#switchport`	Configure xe6 as Layer 2 port
`(config-if)#bridge-group 1`	Configure xe6 in bridge group 1
`(config-if)#switchport mode trunk`	Configure mode trunk

(config-if)#switchport trunk allowed vlan add 10	Add vlan 10 to the interface xe4
(conig-if)#exit	Exit Interface mode

SW3 (Slave clock)

(config)#synce-interface ptp	Configure synce interface ptp
(config-synce-if)#mode synchronous	Configure synchronous mode
(config-synce-if)#input-source 1	Configure the interface as an input source with priority 1
(config-synce-if)#quality-level QL_PRC	Configure QL-value.
(config-synce-if)#mode synchronous	Configure synchronous mode.
(config-synce-if)#wait-to-restore 0	Configure Wait-to-Restore timer.
(config-synce-if)#exit	Exit Interface configure mode
(config)#interface xe6	Configure interface xe6
(config-if)#ip address 192.168.5.103/24	Configure Ipv4 address of interface
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8265.1	Enables G8265.1 for PTP time/phase telecom profile
(config-ptp-clk)#slave-only	Configure the device as a Slave clock
(config-clk-clk)#clock-port 1	Configure ptp clock-port 1
(config-clk-port)#transport ipv4	Configure transport as ipv4
(config-clk-port)#network-interface xe6	Configure underlying interface that is used by this PTP Port
(config-clk-port)#master ipv4 192.168.5.102	Configure the master ipv4 address
(config-clk-port)#exit	Exit ptp clock port mode

SW1 (T-GM)

#configure terminal	Enter Configure mode
(config)#bridge 1 protocol mstp	Create bridge 1 as an MSTP bridge (this step is not mandatory, but is a good practice to avoid layer 2 loops)
(config)#synce	Enter configure Synchronous Ethernet mode.
(config-synce)#synchronization option 1	Set the synchronization network type.
(config-synce)#exit	Exit Synce mode
(config)#synce-interface gps	Configure synce interface gps
(config-synce-if)#mode synchronous	Configure synchronous mode
(config-synce-if)#input-source 1	Configure the interface as an input source with priority 1
(config-synce-if)#quality-level QL_PRC	Configure QL-value.
(config-synce-if)#mode synchronous	Configure synchronous mode.
(config-synce-if)#wait-to-restore 0	Configure Wait-to-Restore timer.
(config-synce-if)#exit	Exit Port Configure mode
(config)#interface xe4	Configure interface xe4
(config-if)#ip address 192.168.5.102/24	Configure ipv4 address of xe4
(config-if)#exit	Exit interface mode

(config)#ptp clock 0 profile g8265.1	Enables G8265.1 for PTP time/phase telecom profile
(config-ptp-clk)#clock-type tgm	Enables clock type as T-GM
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 2	Configure ptp clock-port 2
(config-ptp-clk)#transport ipv4	Configure transport as ipv4
(config-clk-port)#master-only	Configure the port as an master-only port
(config-clk-port)#network-interface xe4	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 1	Configure ptp clock-port 1
(config-clk-port)#network-interface gps	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

Validation

SW1

1. Verify the port state on SW1.

```
#sh ptp servo
PTP servo status for clock 0
  Servo Config                : Freq + Phase Correction
  Servo State                 : Time Locked
  Servo State Duration        : 00:16:07
  Servo APTS Mode             : GPS
  Frequency Correction        : 231.812 ppb
  Phase Correction            : -155999960695.000 nsec
  Offset From Master          : 0.000 nsec
  Mean Path Delay             : 0 nsec
  APTS GPS to PTP Offset      : 0 nsec
  Sync Packet Rate            : 0
  Delay Packet Rate           : 0
```

SW3

1.Verify the ptp servo on SW3.

```
#sh ptp servo
PTP servo status for clock 0
  Servo Config                : Freq + Phase Correction
  Servo State                 : Time Locked
  Servo State Duration        : 00:16:39
  Servo APTS Mode             : PTP
  Frequency Correction        : -217.791 ppb
  Phase Correction            : 48.000 nsec
  Offset From Master          : 77.000 nsec
  Mean Path Delay             : 246 nsec
  APTS GPS to PTP Offset      : 0 nsec
  Sync Packet Rate            : 32
```

```
  Delay Packet Rate           : 32
```

2.Verify the port status on SW3.

```
#sh ptp port
Port 1:
  Port State                  : Slave
  Port Identity               : E8:C5:7A:FF:FE:5C:A0:6C:00:01
  Peer Mean Path Delay        : 0
  Log Announce Interval       : 1
  Log Min Delay Req Interval  : -5
  Log Sync Interval           : -5
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : xe6
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300
  Configured delay asymmetry  : 0 nsec

  Number of Foreign Masters   : 1
  Current Foreign Master      : 0

  Foreign Master #0
  IPv4 Address                : 192.168.5.102
  Grandmaster clockIdentity   : E8:C5:7A:FF:FE:69:4D:E6
  Port ID                     : E8:C5:7A:FF:FE:69:4D:E6:00:01
  clockClass                  : 84
  Clock accuracy              : 33
  Offset scaled log variance  : 20061
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 1
  PDV Scaled Allan Variance   : 21

  Received Packets            : 255700
  Discarded Packets           : 122
  Transmitted Packets         : 126785

  Drop Counters
  Pkt rcvd on bad port state  : 122

  Peer #0
  IPv4 Address                : 192.168.5.102
  Clock Identity              : e8:c5:7a:ff:fe:69:4d:e6
  Received Announce           : 1983
```

```
  Received Sync               : 61345
  Received Delay Response     : 61223
  Received Signalling         : 81
  Transmitted Delay Request   : 61223
  Transmitted Signalling      : 28

  Master #0                   : 192.168.5.102
```

Note: Note: Use show ptp stats to collect the PTP statistics and use clear ptp stats to clear the same.

CHAPTER 3 PTP G.8275.1 Profile Configuration

This chapter shows how to configure a PTP G.8275.1 profile over Ethernet, IPv4, and IPv6. You configure T-GM and boundary clock with more than one port.

Note: Enable G.8275.1 profile only on L3 interfaces and sub interfaces. When LAG is available configure the PTP on a LAG interface. However, in certain cases, L2-LAG-member interface is supported. For example, MLAG use cases.

Topology

Figure 3-3: Configuration Topology

In this example, SW1, SW2 and SW3 are running PTP. SW1 acting as T-GM and SW2, SW3 acting as boundary clock.

PTP G.8275.1 Profile Configuration

This section shows how to set up G.8275.1 profile.

SW2 (boundary clock)

`#configure terminal`	Enter Configure mode
`(config)#bridge 1 protocol mstp`	Create bridge 1 as an MSTP bridge (this step is not mandatory, but is a good practice to avoid layer 2 loops)
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#synchronization option 1`	Set the synchronization network type.
`(config-synce)#exit`	Exit Synce mode
`(config)#interface eth1`	Configure interface eth1
`(config-if)#switchport`	Configure eth1 as Layer 2 port
`(config-if)#bridge-group 1`	Configure eth1 in bridge group 1
`(config-if)#synce`	Enter interface Synchronous Ethernet mode.
`(config-if-synce)#mode synchronous`	Configure synchronous mode.
`(config-if-synce)#input-source 2`	Configure the interface as an input source with priority 2.
`(config-if-synce)#wait-to-restore 1`	Configure Wait-to-Restore timer.
`(config-if-synce)#exit`	Exit Port Configure mode
`(conig-if)#exit`	Exit Interface mode
`(config)#interface eth2`	Configure interface eth2

(config-if)#switchport	Configure eth2 as Layer 2 port
(config-if)#bridge-group 1	Configure eth2 in bridge group 1
(config-if)#synce	Enter interface Synchronous Ethernet mode.
(config-if-synce)#mode synchronous	Configure synchronous mode.
(config-if-synce)#output-source	Configure the interface as an output source.
(config-if-synce)#exit	Exit Port Configure mode
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8275.1	Enables G8275.1 for PTP time/phase telecom profile
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 2	Configure ptp port
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 1	Configure ptp port
(config-clk-port)#network-interface eth1	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

SW3 (Boundary clock)

#configure terminal	Enter Configure mode
(config)#bridge 1 protocol mstp	Create bridge 1 as an MSTP bridge (this step is not mandatory, but is a good practice to avoid layer 2 loops)
(config)#synce	Enter configure Synchronous Ethernet mode.
(config-synce)#synchronization option 1	Set the synchronization network type.
(config-synce)#exit	Exit Synce mode
(config)#interface eth2	Configure interface eth2
(config-if)#switchport	Configure eth2 as Layer 2 port
(config-if)#bridge-group 1	Configure eth2 in bridge group 1
(config-if)#synce	Enter interface Synchronous Ethernet mode.
(config-if-synce)#mode synchronous	Configure synchronous mode.
(config-if-synce)#input-source 4	Configure the interface as an input source with priority 4.
(config-if-synce)#wait-to-restore 1	Configure Wait-to-Restore timer.
(config-if-synce)#exit	Exit Port Configure mode
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8275.1	Enables G8275.1 for PTP time/phase telecom profile
(config-ptp-clk)#number-ports 1	Configure the number of PTP ports on the instance
(config-clk-clk)#clock-port 1	Configure ptp port
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

SW1 (T-GM)

`#configure terminal`	Enter Configure mode
`(config)#bridge 1 protocol mstp`	Create bridge 1 as an MSTP bridge (this step is not mandatory, but is a good practice to avoid layer 2 loops)
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#synchronization option 1`	Set the synchronization network type.
`(config-synce)#exit`	Exit Synce mode
`(config)#synce-interface gps`	Configure synce interface gps
`(config-synce-if)#mode synchronous`	Configure synchronous mode
`(config-synce-if)#input-source 1`	Configure the interface as an input source with priority 1
`(config-synce-if)#quality-level QL_PRC`	Configure QL-value.
`(config-synce-if)#mode synchronous`	Configure synchronous mode.
`(config-synce-if)#wait-to-restore 1`	Configure Wait-to-Restore timer.
`(config-synce-if)#exit`	Exit Port Configure mode
`(config)#interface eth1`	Configure interface eth2
`(config-if)#switchport`	Configure eth2 as Layer 2 port
`(config-if)#bridge-group 1`	Configure eth2 in bridge group 1
`(config-if)#synce`	Enter interface Synchronous Ethernet mode.
`(config-if-synce)#mode synchronous`	Configure synchronous mode.
`(config-if-synce)#output-source`	Configure the interface as an output source.
`(config-if-synce)#exit`	Exit Port Configure mode
`(config-if)#exit`	Exit interface mode
`(config)#ptp clock 0 profile g8275.1`	Enables G8275.1 for PTP time/phase telecom profile
`(config-ptp-clk)#clock-type tgm`	Enables clock type as T-GM
`(config-ptp-clk)#number-ports 2`	Configure the number of PTP ports on the instance
`(config-ptp-clk)#clock-port 2`	Configure ptp port
`(config-clk-port)#master-only`	Configure the port as an master-only port
`(config-clk-port)#network-interface eth1`	Configure underlying interface that is used by this PTP Port
`(config-clk-port)#exit`	Exit ptp clock port mode
`(config-ptp-clk)#clock-port 1`	Configure ptp port
`(config-clk-port)#network-interface gps`	Configure underlying interface that is used by this PTP Port
`(config-clk-port)#exit`	Exit ptp clock port mode

Validation

SW2

1. Verify the default data set on SW2.

```
#sh ptp clock 0 dataset
Default Dataset:
  Two Step Flag               : No
```

```
  Clock Identity              : E8:C5:7A:FF:FE:23:6E:1C
  Number Of Ports             : 2
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 24
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535
```

2. Verify the port state on SW2.

```
#show ptp clock 0 port
Port 1:
  Port State                  : Slave
  Port Identity               : E8:C5:7A:FF:FE:23:6E:1C:00:01
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Log Min Delay Req Interval  : -4
  Log Sync Interval           : -4
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : eth1
  Vlan Configured             :
  Description                 :
  Configured delay asymmetry  : 0 nsec

  Number of Foreign Masters   : 1
  Current Foreign Master      : 0

  Foreign Master #0
  L2 Address                  : a0:00:00:00:00:01
  Grandmaster clockIdentity   : 00:00:00:00:00:00:00:01
  Port ID                     : 00:00:00:00:00:00:00:01:00:01
  clockClass                  : 6
  Clock accuracy              : 33
  Offset scaled log variance  : 65535
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 0
  PDV Scaled Allan Variance   : 5

  Received Packets            : 46955
  Discarded Packets           : 4
  Transmitted Packets         : 19485
```

```
  Drop Counters
  Pkt rcvd on bad port state  : 4

  Peer #0
  L2 Address                  : a0:00:00:00:00:01
  Clock Identity              : 00:00:00:00:00:00:00:01
  Received Announce           : 9392
  Received Sync               : 18784
  Received Delay Response     : 18781
  Transmitted Delay Request   : 18781

Port 2:
  Port State                  : Master
  Port Identity               : E8:C5:7A:FF:FE:23:6E:1C:00:02
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Log Min Delay Req Interval  : -4
  Log Sync Interval           : -4
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : eth2
  Vlan Configured             :
  Description                 :
  Configured delay asymmetry  : 0 nsec

  Received Packets            : 18783
  Discarded Packets           : 0
  Transmitted Packets         : 47655

  Peer #0
  L2 Address                  : d0:00:00:00:00:01
  Clock Identity              : 00:00:00:00:00:00:00:02
  Received Delay Request      : 18786
  Transmitted Announce        : 9626
  Transmitted Sync            : 19251
  Transmitted Delay Response  : 18786
```

3. Verify the ptp servo on SW2.

```
#sh ptp servo
PTP servo status for clock 0
  Servo Config                : Phase Correction
  Servo State                 : Normal Loop
  Servo State Duration        : 00:20:46
  Servo APTS Mode             : N/A
  Frequency Correction        : 0.000 ppb
  Phase Correction            : -3537.000 nsec
```

```
  Offset From Master          : -479.000 nsec
  Mean Path Delay             : 3536 nsec
  APTS GPS to PTP Offset      : 0 nsec
  Sync Packet Rate            : 16
  Delay Packet Rate           : 16
```

Note: Use `show ptp clock 0 stats` to collect the PTP statistics and use `clear ptp clock 0 stats` to clear the same.

CHAPTER 4 PTP G.8275.2 Profile Configuration

This chapter shows how to configure a PTP G.8275.2 profile over IPv4 and IPv6. You configure T-GM and boundary clock with more than one port.

Note:

- Enable G.8275.2 profile on L3 interfaces, sub interfaces and the LAG interface when LAG is available.
- SyncE is optional for G.8275.2 profile.

Partial Timing Support (PTS) Topology

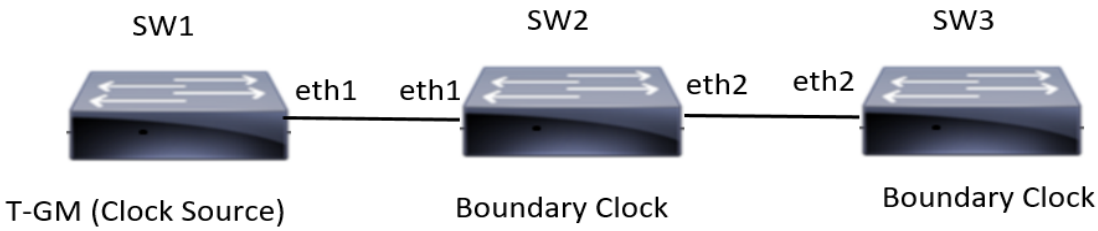


Figure 4-4: Configuration Topology

In this example, SW1, SW2 and SW3 are running PTP. SW1 acting as T-GM and SW2, SW3 acting as boundary clock.

PTS G.8275.2 Profile Configuration

This section shows how to set up a G.8275.2 Profile.

SW2 (boundary clock)

`#configure terminal`	Enter Configure mode
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#synchronization option 1`	Set the synchronization network type.
`(config-synce)#exit`	Exit Synce mode
`(config)#interface eth1`	Configure interface eth1
`(config-if)#ip address 192.168.4.101/24`	Configure the IP address of the interface.
`(config-synce-if)#exit`	Exit synce Configure mode.
`(config)#interface eth2`	Configure interface eth2
`(config-if)#ip address 192.168.5.100/24`	Configure the IP address of the interface.
`(config-if)#exit`	Exit interface mode
`(config)#ptp clock 0 profile g8275.2`	Enables G8275.2 for PTP time/phase telecom profile
`(config-ptp-clk)#number-ports 2`	Configure the number of PTP ports on the instance
`(config-ptp-clk)#clock-port 1`	Configure ptp port
`(config-clk-port)#transport ipv4`	Set transport type ipv4
`(config-clk-port)#network-interface eth1`	Configure underlying interface that is used by this PTP Port

(config-clk-port)#master ipv4 192.168.4.100	Set master clock source address
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 2	Configure ptp port
(config-clk-port)#transport ipv4	Set transport type ipv4
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

SW3 (Boundary clock)

#configure terminal	Enter Configure mode
(config)#synce	Enter configure Synchronous Ethernet mode.
(config-synce)#synchronization option 1	Set the synchronization network type.
(config-synce)#exit	Exit Synce mode
(config)#interface eth1	Configure interface eth1
(config-if)#ip address 192.168.4.101/24	Configure the IP address of the interface.
(config-synce-if)#exit	Exit synce Configure mode.
(config)#interface eth2	Configure interface eth2
(config-if)#ip address 192.168.5.100/24	Configure the IP address of the interface.
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8275.2	Enables G8275.2 for PTP time/phase telecom profile
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 1	Configure ptp port
(config-clk-port)#transport ipv4	Set transport type ipv4
(config-clk-port)#network-interface eth1	Configure underlying interface that is used by this PTP Port
(config-clk-port)#master ipv4 192.168.4.100	Set master clock source address
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 2	Configure ptp port
(config-clk-port)#transport ipv4	Set transport type ipv4
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

SW1 (T-GM)

#configure terminal	Enter Configure mode
(config)#synce	Enter configure Synchronous Ethernet mode.
(config-synce)#synchronization option 1	Set the synchronization network type.
(config-synce)#exit	Exit Synce mode
(config)#synce-interface gps	Configure synce interface gps
(config-synce-if)#mode synchronous	Configure synchronous mode
(config-synce-if)#input-source 1	Configure the interface as an input source with priority 1
(config-synce-if)#quality-level QL_PRC	Configure QL-value.
(config-synce-if)#wait-to-restore 1	Configure Wait-to-Restore timer.

(config-synce-if)#exit	Exit Port Configure mode
(config)#interface eth2	Configure interface eth2
(config-if)#ip address 192.168.4.100/24	Configure the IP address of the interface.
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8275.2	Enables G8275.2 for PTP time/phase telecom profile
(config-ptp-clk)#clock-type tgm	Enables clock type as T-GM
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 2	Configure ptp port
(config-clk-port)#transport ipv4	Configure the port as an master-only port
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#master-only	Configure the port as an master-only port
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 1	Configure ptp port
(config-clk-port)#network-interface gps	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

Validation

SW2

1. Verify the default data set on SW2.

```
#show ptp 0 clock dataset default
  Two Step Flag               : No
  Clock Identity              : E8:C5:7A:FF:FE:02:A0:3C
  Number Of Ports             : 2
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 44
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535
```

2. Verify the port state on SW2.

```
#show ptp clock 0 port
Port 1:
  Port State                  : Slave
  Port Identity               : E8:C5:7A:FF:FE:02:A0:3C:00:01
  Log Min Delay Req Interval  : -6
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
```

```
  Announce Receipt Timeout    : 3
  Log Sync Interval           : -6
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : eth1
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300

  Number of Foreign Masters   : 1
  Current Foreign Master      : 0

  Foreign Master #0
  IPv4 Address                : 192.168.4.100
  Grandmaster clockIdentity   : 00:00:00:00:00:00:00:01
  Port ID                     : 00:00:00:00:00:00:00:01:00:01
  clockClass                  : 6
  Clock accuracy              : 33
  Offset scaled log variance  : 20061
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 0
  PDV Scaled Allan Variance   : 5

  Received Packets            : 109666
  Discarded Packets           : 0
  Transmitted Packets         : 51821

  Peer #0
  IPv4 Address                : 192.168.4.100
  Clock Identity              : 00:00:00:00:00:00:00:01
  Received Announce           : 6435
  Received Sync               : 51415
  Received Delay Response     : 51825
  Received Signalling         : 18
  Transmitted Delay Request   : 51825
  Transmitted Signalling      : 38

  Master #0                   : 192.168.4.100

Port 2:
  Port State                  : Master
  Port Identity               : E8:C5:7A:FF:FE:02:A0:3C:00:02
  Log Min Delay Req Interval  : -6
  Peer Mean Path Delay        : 0
```

```
  Log Announce Interval       : -3
  Announce Receipt Timeout    : 3
  Log Sync Interval           : -6
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : eth2
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300

  Received Packets            : 51476
  Discarded Packets           : 0
  Transmitted Packets         : 109804

  Peer #0
  IPv4 Address                : 192.168.5.101
  Clock Identity              : 00:00:00:00:00:00:00:02
  Received Delay Request      : 51485
  Received Signalling         : 18
  Transmitted Announce        : 6436
  Transmitted Sync            : 51902
  Transmitted Delay Response  : 51485
  Transmitted Signalling      : 18

  Slave #0
  IPv4 Address                : 192.168.5.101
  Clock Identity              : 00:00:00:00:00:00:00:02
  Delay Mechanism             : End to end
  log Announce Interval       : -3
  log Sync Interval           : -6
  Log Delay Req Interval      : -6
```

3. Verify the ptp servo on SW2.

```
#sh ptp servo
PTP servo status for clock 0
  Servo Config                : Freq + Phase Correction
  Servo State                 : Time Locked
  Servo State Duration        : 00:13:33
  Servo APTS Mode             : PTP
  Frequency Correction        : -0.674 ppb
  Phase Correction            : 0.000 nsec
  Offset From Master          : 10.000 nsec
  Mean Path Delay             : 3060 nsec
  APTS GPS to PTP Offset      : 0 nsec
  Sync Packet Rate            : 64
  Delay Packet Rate           : 65
```

Note: Use show ptp stats to collect the PTP statistics and use clear ptp stats to clear the same.

Asserted Partial Timing Support (APTS) Topology

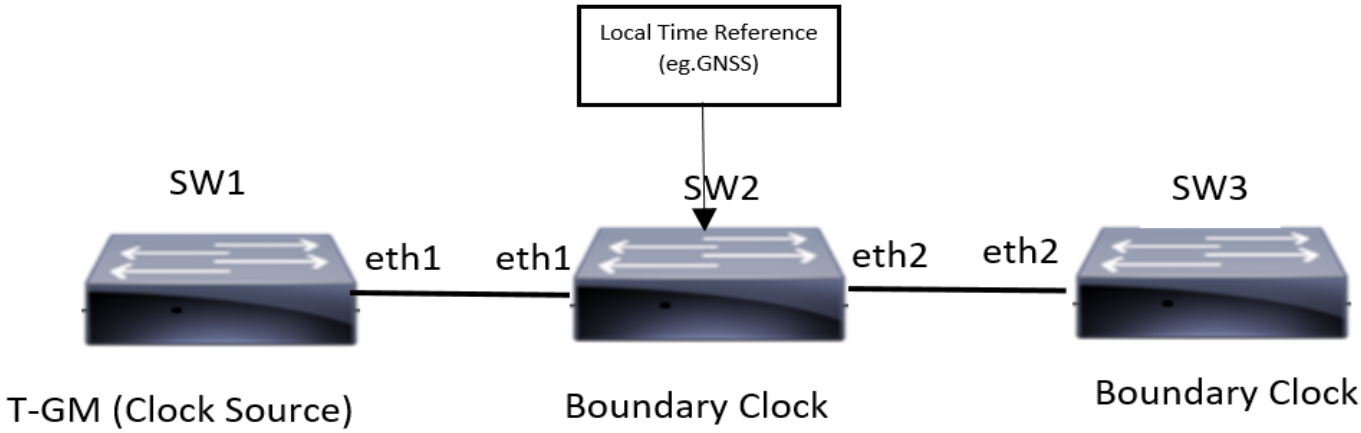


Figure 4-5: Configuration Topology

In this example, SW1, SW2 and SW3 are running PTP. SW1 acting as T-GM and SW2, SW3 acting as boundary clock.

APTS G.8275.2 Profile Configuration

This section shows how to set up a G.8275.2 Profile.

SW2 (boundary clock)

`#configure terminal`	Enter Configure mode
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#synchronization option 1`	Set the synchronization network type.
`(config-synce)#exit`	Exit Synce mode
`(config)#synce-interface gps`	Configure synce interface gps
`(config-synce-if)#mode synchronous`	Configure synchronous mode
`(config-synce-if)#input-source 1`	Configure the interface as an input source with priority 1
`(config-synce-if)#quality-level QL_PRC`	Configure QL-value.
`(config-synce-if)#wait-to-restore 1`	Configure Wait-to-Restore timer.
`(config-synce-if)#exit`	Exit Port Configure mode.
`(config)#interface eth1`	Configure interface eth1
`(config-if)#ip address 192.168.4.101/24`	Configure the IP address of the interface.
`(config-synce-if)#exit`	Exit synce Configure mode.
`(config)#interface eth2`	Configure interface eth2
`(config-if)#ip address 192.168.5.100/24`	Configure the IP address of the interface.

(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8275.2	Enables G8275.2 for PTP time/phase telecom profile
(config-ptp-clk)#number-ports 3	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 1	Configure ptp port
(config-clk-port)#network-interface gps	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 2	Configure ptp port
(config-clk-port)#transport ipv4	Set transport type ipv4
(config-clk-port)#network-interface eth1	Configure underlying interface that is used by this PTP Port
(config-clk-port)#master ipv4 192.168.4.100	Set master clock source address
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 3	Configure ptp port
(config-clk-port)#transport ipv4	Set transport type ipv4
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

SW3 (Boundary clock)

#configure terminal	Enter Configure mode
(config)#synce	Enter configure Synchronous Ethernet mode.
(config-synce)#synchronization option 1	Set the synchronization network type.
(config-synce)#exit	Exit Synce mode
(config)#interface eth2	Configure interface eth2
(config-if)#ip address 192.168.5.101/24	Configure eth2 as Layer 2 port
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8275.2	Enables G8275.2 for PTP time/phase telecom profile
(config-ptp-clk)#number-ports 1	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 1	Configure ptp port
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#transport ipv4	Set transport type ipv4.
(config-clk-port)#master ipv4 192.168.5.100	Set master clock source address.
(config-clk-port)#exit	Exit ptp clock port mode

SW1 (T-GM)

#configure terminal	Enter Configure mode
(config)#synce	Enter configure Synchronous Ethernet mode.
(config-synce)#synchronization option 1	Set the synchronization network type.
(config-synce)#exit	Exit Synce mode
(config)#synce-interface gps	Configure synce interface gps
(config-synce-if)#mode synchronous	Configure synchronous mode
(config-synce-if)#input-source 1	Configure the interface as an input source with priority 1

(config-synce-if)#quality-level QL_PRC	Configure QL-value.
(config-synce-if)#wait-to-restore 1	Configure Wait-to-Restore timer.
(config-synce-if)#exit	Exit Port Configure mode
(config)#interface eth2	Configure interface eth2
(config-if)#ip address 192.168.4.100/24	Configure the IP address of the interface.
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8275.2	Enables G8275.2 for PTP time/phase telecom profile
(config-ptp-clk)#clock-type tgm	Enables clock type as T-GM
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 2	Configure ptp port
(config-clk-port)#transport ipv4	Configure the port as an master-only port
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#master-only	Configure the port as an master-only port
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 1	Configure ptp port
(config-clk-port)#network-interface gps	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

Validation

SW2

1. Verify the default data set on SW2.

```
#show ptp clock 0 dataset
Default Dataset:
  Two Step Flag               : No
  Clock Identity              : E8:C5:7A:FF:FE:23:6E:1C
  Number Of Ports             : 3
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 44
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535
```

2. Verify the port state on SW2.

```
#show ptp clock 0 port
Port 1:
  Port State                  : Slave
  Port Identity               : E8:C5:7A:FF:FE:23:6E:1C:00:01
  Peer Mean Path Delay        : 0
```

```
  Log Announce Interval       : -3
  Log Min Delay Req Interval  : 127
  Log Sync Interval           : -6
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 0
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : gps
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300
  Configured delay asymmetry  : 0 nsec

  Received Packets            : 0
  Discarded Packets           : 0
  Transmitted Packets         : 0

Port 2:
  Port State                  : Slave
  Port Identity               : E8:C5:7A:FF:FE:23:6E:1C:00:02
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Log Min Delay Req Interval  : -6
  Log Sync Interval           : -6
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : xe14
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300
  Configured delay asymmetry  : 0 nsec

  Number of Foreign Masters   : 1
  Current Foreign Master      : 0

  Foreign Master #0
  IPv4 Address                : 192.168.4.100
  Grandmaster clockIdentity   : 00:00:00:00:00:00:00:01
  Port ID                     : 00:00:00:00:00:00:00:01:00:02
  clockClass                  : 6
```

```
  Clock accuracy              : 33
  Offset scaled log variance  : 20061
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 0
  PDV Scaled Allan Variance   : 32

  Received Packets            : 41218
  Discarded Packets           : 0
  Transmitted Packets         : 19473

  Peer #0
  IPv4 Address                : 192.168.4.100
  Clock Identity              : 00:00:00:00:00:00:00:01
  Received Announce           : 191
  Received Sync               : 1523
  Received Delay Response     : 1536
  Transmitted Delay Request   : 1536

  Master #0                   : 192.168.4.100

Port 3:
  Port State                  : Master
  Port Identity               : E8:C5:7A:FF:FE:23:6E:1C:00:03
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Log Min Delay Req Interval  : -6
  Log Sync Interval           : -6
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : xe15
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300
  Configured delay asymmetry  : 0 nsec

  Received Packets            : 19385
  Discarded Packets           : 0
  Transmitted Packets         : 41355

  Peer #0
  IPv4 Address                : 192.168.5.101
  Clock Identity              : 00:00:00:00:00:00:00:02
  Received Delay Request      : 1521
```

```
  Received Signalling         : 3
  Transmitted Announce        : 190
  Transmitted Sync            : 1533
  Transmitted Delay Response  : 1521
  Transmitted Signalling      : 3

  Slave #0
  IPv4 Address                : 192.168.5.101
  Clock Identity              : 00:00:00:00:00:00:00:02
  Delay Mechanism             : End to end
  log Announce Interval       : -3
  log Sync Interval           : -6
  Log Delay Req Interval      : -6
```

3. Verify the ptp servo on SW2.

```
#sh ptp servo
PTP servo status for clock 0
  Servo Config                : Freq + Phase Correction
  Servo State                 : Time Locked
  Servo State Duration        : 00:11:17
  Servo APTS Mode             : GPS
  Frequency Correction        : 0.002 ppb
  Phase Correction            : 0.000 nsec
  Offset From Master          : 0.000 nsec
  Mean Path Delay             : 0 nsec
  APTS GPS to PTP Offset      : 32723445187 nsec
  Sync Packet Rate            : 0
  Delay Packet Rate           : 0
```

Note: Use show ptp stats to collect the PTP statistics and use clear ptp stats to clear the same.

PTP G.8275.2 Profile Source IP as Loopback Configuration

This section shows how to configure a PTP G.8275.2 profile source IP as Loopback over IPv4 and IPv6. You configure T-GM and boundary clock with more than one port.

Topology

Figure 4-6:

Configuration

This section shows how to set up a G.8275.2 Profile with loopback using as source IP

SW1 (TGM)

`#configure terminal`	Enter Configure mode
`(config)#interface lo`	Configure loopback interface lo
`(config-if)#ip address 1.1.1.1/32 secondary`	Configure the IP address of the loopback interface.
`(config-if)#interface eth1`	Configure interface eth1
`(config-if)#ip address 192.168.4.101/24`	Configure the IP address of the interface.
`(config-if)#interface eth2`	Configure interface eth2
`(config-if)#ip address 10.1.1.1/24`	Configure the IP address of the interface.
`(config-if)#exit`	Exit interface mode
`(config)#ptp clock 0 profile g8275.2`	Enables G8275.2 for PTP time/phase telecom profile
`(config-ptp-clk)#number-ports 2`	Configure the number of PTP ports on the instance
`(config-ptp-clk)#clock-port 1`	Configure ptp port
`(config-clk-port)#transport ipv4`	Set transport type ipv4
`(config-clk-port)# source-address ipv4 interface lo`	Configure underlying loopback source interface that is used by this PTP Port
`(config-clk-port)#network-interface eth1`	Configure underlying interface that is used by this PTP Port
`(config-clk-port)#exit`	Exit ptp clock port mode
`(config-ptp-clk)#clock-port 2`	Configure ptp port
`(config-clk-port)#transport ipv4`	Set transport type ipv4
`(config-clk-port)# source-address ipv4 interface lo`	Configure underlying loopback source interface that is used by this PTP Port
`(config-clk-port)#network-interface eth2`	Configure underlying interface that is used by this PTP Port
`(config-clk-port)#exit`	Exit ptp clock port mode

SW2 (Boundary clock)

`#configure terminal`	Enter Configure mode
`(config)#interface eth1`	Configure interface eth1

(config-if)#ip address 192.168.4.100/24	Configure the IP address of the interface.
(config-if)#interface lo	Configure interface loopback
(config-if)#ip address 2.2.2.2/32 secondary	Configure the loopback IP address of the interface.
(config)#interface eth2	Configure interface eth2
(config-if)#ip address 10.1.1.2/24	Configure the IP address of the interface.
(config-if)#exit	Exit interface mode
(config-if)#ip route 1.1.1.1/32 192.168.4.100	Configure the static route to reach other network
(config-if)#ip route 1.1.1.1/32 10.1.1.1	Configure the static route to reach other network
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile g8275.2	Enables G8275.2 for PTP time/phase telecom profile
(config-ptp-clk)#number-ports 3	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 1	Configure ptp port
(config-clk-port)#transport ipv4	Set transport type ipv4
(config-clk-port)#network-interface eth1	Configure underlying interface that is used by this PTP Port
(config-clk-port)#master ipv4 1.1.1.1	Set master clock source address using loopback ip
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 2	Configure ptp port
(config-clk-port)#transport ipv4	Set transport type ipv4
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port
(config-clk-port)#master ipv4 1.1.1.1	Set master clock source address
(config-clk-port)#exit	Exit ptp clock port mode

Validation

SW2

1. Verify the port state on SW2.

```
SW2
#show ptp clock 0 port
Port 1:
  Port State                  : Slave
  Port Identity               : E8:C5:7A:FF:FE:02:A0:3C:00:01
  Log Min Delay Req Interval  : -6
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Announce Receipt Timeout    : 3
  Log Sync Interval           : -6
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
```

```
  Network Interface           : eth1
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300

  Number of Foreign Masters   : 1
  Current Foreign Master      : 0

  Foreign Master #0
  IPv4 Address                : 1.1.1.1
  Grandmaster clockIdentity   : 00:00:00:00:00:00:00:01
  Port ID                     : 00:00:00:00:00:00:00:01:00:01
  clockClass                  : 6
  Clock accuracy              : 33
  Offset scaled log variance  : 20061
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 0
  PDV Scaled Allan Variance   : 5

  Received Packets            : 109666
  Discarded Packets           : 0
  Transmitted Packets         : 51821

  Peer #0
  IPv4 Address                : 1.1.1.1
  Clock Identity              : 00:00:00:00:00:00:00:01
  Received Announce           : 6435
  Received Sync               : 51415
  Received Delay Response     : 51825
  Received Signalling         : 18
  Transmitted Delay Request   : 51825
  Transmitted Signalling      : 38

  Master #0                   : 1.1.1.1

SW1

Port 1:
  Port State                  : Master
  Port Identity               : E8:C5:7A:FF:FE:02:A0:3C:00:02
  Log Min Delay Req Interval  : -6
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Announce Receipt Timeout    : 3
  Log Sync Interval           : -6
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : eth1
  Vlan Configured             :
  Description                 :
  TTL                         : 64
```

```
  DSCP                          : 56
  Unicast Grant Duration        : 300

  Received Packets              : 51476
  Discarded Packets             : 0
  Transmitted Packets           : 109804

  Peer #0
  IPv4 Address                  : 10.1.1.2
  Clock Identity                : 00:00:00:00:00:00:00:02
  Received Delay Request        : 51485
  Received Signalling           : 18
  Transmitted Announce          : 6436
  Transmitted Sync              : 51902
  Transmitted Delay Response    : 51485
  Transmitted Signalling        : 18

  Slave #0
  IPv4 Address                  : 10.1.1.2
  Clock Identity                : 00:00:00:00:00:00:00:02
  Delay Mechanism               : End to end
  log Announce Interval         : -3
  log Sync Interval             : -6
  Log Delay Req Interval        : -6
```

3. Verify the ptp servo on SW2.

```
#show ptp servo
PTP servo status for clock 0
  Servo Config                  : Freq + Phase Correction
  Servo State                   : Time Locked
  Servo State Duration          : 00:13:33
  Servo APTS Mode               : PTP
  Frequency Correction          : -0.674 ppb
  Phase Correction              : 0.000 nsec
  Offset From Master            : 10.000 nsec
  Mean Path Delay               : 3060 nsec
  APTS GPS to PTP Offset        : 0 nsec
  Sync Packet Rate              : 64
  Delay Packet Rate             : 65
```

Note: Use show ptp stats to collect the PTP statistics and use clear ptp stats to clear the same.

CHAPTER 5 PTP Default Profile Configuration

This chapter shows how to configure a PTP Default profile over IPv4 and IPv6. You can configure T-GM and boundary clock with more than one port.

Note: You can enable the default profile on L3 physical interfaces, sub interfaces, LAG interfaces and VLAN interfaces.

Topology

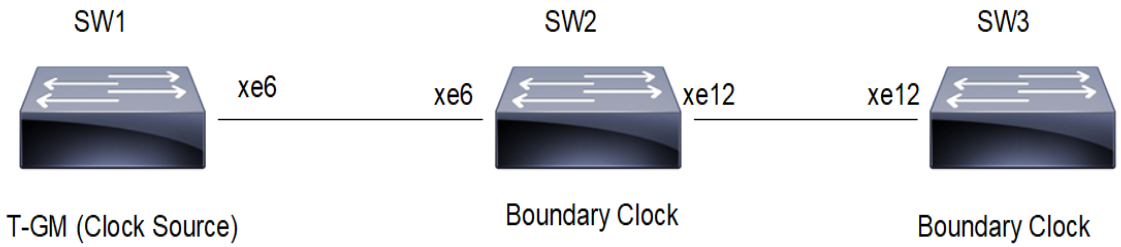


Figure 5-7: Configuration Topology

In this example, SW1, SW2 and SW3 are running PTP. SW1 acting as T-GM and SW2, SW3 acting as boundary clock.

Default Profile Configuration

This section shows how to set up a Default Profile.

SW2 (boundary clock)

`#configure terminal`	Enter Configure mode
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#synchronization option 1`	Set the synchronization network type.
`(config-synce)#exit`	Exit Synce mode
`(config)#interface xe6`	Configure interface eth1
`(config-if)#ip address 192.168.4.100/24`	Configure the IP address of the interface.
`(config-synce-if)#exit`	Exit synce Configure mode.
`(config)#interface xe12`	Configure interface eth2
`(config-if)#ip address 192.168.5.101/24`	Configure the IP address of the interface.
`(config-if)#exit`	Exit interface mode
`(config)#ptp clock 0 profile default`	Enables Default PTP profile
`(config-ptp-clk)#number-ports 2`	Configure the number of PTP ports on the instance
`(config-ptp-clk)#clock-port 1`	Configure ptp port
`(config-clk-port)#transport ipv4`	Set transport type ipv4
`(config-clk-port)#network-interface xe6`	Configure underlying interface that is used by this PTP Port
`(config-clk-port)#master ipv4 192.168.4.100`	Set master clock source address

(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 2	Configure ptp port
(config-clk-port)#transport ipv4	Set transport type ipv4
(config-clk-port)#network-interface xe12	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

SW3 (Boundary clock)

#configure terminal	Enter Configure mode
(config)#synce	Enter configure Synchronous Ethernet mode.
(config-synce)#synchronization option 1	Set the synchronization network type.
(config-synce)#exit	Exit Synce mode
(config)#interface xe12	Configure interface eth1
(config-if)#ip address 192.168.5.102/24	Configure the IP address of the interface.
(config-synce-if)#exit	Exit synce Configure mode.
(config)#ptp clock 0 profile default	Enables DEFAULT for PTP time/phase telecom profile
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 1	Configure ptp port
(config-clk-port)#transport ipv4	Set transport type ipv4
(config-clk-port)#network-interface xe12	Configure underlying interface that is used by this PTP Port
(config-clk-port)#master ipv4 192.168.5.101	Set master clock source address
(config-clk-port)#exit	Exit ptp clock port mode

SW1 (T-GM)

#configure terminal	Enter Configure mode
(config)#synce	Enter configure Synchronous Ethernet mode.
(config-synce)#synchronization option 1	Set the synchronization network type.
(config-synce)#exit	Exit Synce mode
(config)#synce-interface gps	Configure synce interface gps
(config-synce-if)#mode synchronous	Configure synchronous mode
(config-synce-if)#input-source 1	Configure the interface as an input source with priority 1
(config-synce-if)#quality-level QL_PRC	Configure QL-value.
(config-synce-if)#wait-to-restore 1	Configure Wait-to-Restore timer.
(config-synce-if)#exit	Exit Port Configure mode
(config)#interface xe6	Configure interface eth2
(config-if)#ip address 192.168.4.101/24	Configure the IP address of the interface.
(config-if)#exit	Exit interface mode
(config)#ptp clock 0 profile default	Enables DEFAULT PTP profile
(config-ptp-clk)#clock-type tgm	Enables clock type as T-GM
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 2	Configure ptp port

(config-clk-port)#transport ipv4	Configure the port as an master-only port
(config-clk-port)#network-interface xe6	Configure underlying interface that is used by this PTP Port
(config-clk-port)#master-only	Configure the port as an master-only port
(config-clk-port)#exit	Exit ptp clock port mode
(config-ptp-clk)#clock-port 1	Configure ptp port
(config-clk-port)#network-interface gps	Configure underlying interface that is used by this PTP Port
(config-clk-port)#exit	Exit ptp clock port mode

Validation

SW2

```
#sh ptp clock 0 dataset
Default Dataset:
  Two Step Flag               : No
  Clock Identity              : E8:C5:7A:FF:FE:8F:B4:31
  Number Of Ports             : 3
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 0
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535

Current Dataset:
  Steps Removed               : 1
  Offset From Master          : -24 nsec
  Mean Path Delay             : 3080 nsec

Parent Dataset:
  Parent Port ID              :
    Clock Identity            : 00:00:00:00:00:00:00:01
    Port Number               : 1
  Parent Stats                : No
  Observed Parent O.S.L.V     : 65535 (Offset Scaled Log Variance)
  Observed Parent P.C.R.      : 2147483647 (Phase Change Rate)
  Grandmaster Identity        : 00:00:00:00:00:00:00:01
  Grandmaster Priority1       : 128
  Grandmaster Priority2       : 128
  Grandmaster Clock Quality   :
    Clock Class               : 6
    Clock Accuracy            : 32
    Offset ScaledLogVariance  : 0
```

```
Time Dateset:
  Current UTC Offset Valid    : True
  Current UTC Offset          : 37
  Leap 59                     : False
  Leap 61                     : False
  Time Traceable              : True
  Frequency Traceable         : True
  PTP Timescale               : True
  Time Source                 : Atomic clock
  Time of Day                 : Mon 11 Jul 2022 11:07:31 UTC

#show ptp clock 0 port Port 1:
Port State: Slave
Port Identity: E8:C5:7A:FF:FE:5C:77:6C:00:01
Peer Mean Path Delay: 0
Log Announce Interval  : 1
Log Min Delay Req Interval : 0 Log Sync Interval: 0 Announce Receipt Timeout  : 3
Delay Mechanism: End to end
Version Number: 2
Local Priority: 128
Master only: False
Signal Fail: False
Network Interface: xe6
Vlan Configured:
Description:
TTL : 64
DSCP: 56
Unicast Grant Duration: 300 Configured delay asymmetry : 0 nsec
Number of Foreign Masters : 1 Current Foreign Master   : 0

Foreign Master #0
IPv4 Address: 192.168.4.101
Grandmaster clockIdentity: E8:C5:7A:FF:FE:69:4D:1A
Port ID: E8:C5:7A:FF:FE:69:4D:1A:00:01
clockClass:6
Clock accuracy:33
Offset scaled logvariance :20061
priority1:128
priority2:128
Steps removed:1
PDV Scaled AllanVariance:12

Received Packets:
773
Discarded Packets:3
Transmitted Packets:313

Drop Counters
Pkt rcvd on bad port state :3
Peer #0
```

```
IPv4 Address:
192.168.4.101
Clock Identity:e8:c5:7a:ff:fe:69:4d:1a
Received Announce:154
Received Sync:306
Received Delay Response:304
Received Signalling:9
Transmitted Delay Request:304
Transmitted Signalling:9
Master #0:192.168.4.101

Port 2:
Port State: Master
Port Identity: E8:C5:7A:FF:FE:5C:77:6C:00:02
Peer Mean Path Delay: 0
Log Announce Interval  : 1
Log Min Delay Req Interval : 0 Log Sync Interval: 0 Announce Receipt Timeout  : 3
Delay Mechanism: End to end
Version Number: 2
Local Priority: 128
Master only: False
Signal Fail: False
Network Interface: xe12
Vlan Configured:
Description:
TTL : 64
DSCP: 56
Unicast Grant Duration: 300 Configured delay asymmetry : 0 nsec
Received Packets: 259
Discarded Packets: 0


Transmitted Packets: 641

Peer #0
IPv4 Address: 192.168.5.102
Clock Identity: b8:6a:97:ff:fe:f5:e7:c4 Received Delay Request: 253
Received Signalling: 6
Transmitted Announce: 128
Transmitted Sync: 254 Transmitted Delay Response : 253 Transmitted Signalling   : 6

Slave #0
IPv4 Address: 192.168.5.102
Clock Identity: b8:6a:97:ff:fe:f5:e7:c4
Delay Mechanism: End to end
log Announce Interval: 1
log Sync Interval: 0 Log Delay Req Interval: 0

#show ptp servo
PTP servo status for clock 0
```

```
Servo Config: Freq + Phase Correction
Servo State: Time Locked
Servo State Duration: 00:04:56
Servo APTS Mode: PTP
Frequency Correction: 0.170 ppb
Phase Correction: 0.000 nsec
Offset From Master: 35.500 nsec
Mean Path Delay: 101 nsec APTS GPS to PTP Offset: 0 nsec Sync Packet Rate: 1
Delay Packet Rate: 1
```

SW3

```
#show ptp servo
PTP servo status for clock 0
Servo Config: Freq + Phase Correction
Servo State: Time Locked
Servo State Duration: 00:00:26
Servo APTS Mode: PTP Frequency Correction: -2.146 ppb Phase Correction: 0.000 nsec
Offset From Master: -190.000 nsec
Mean Path Delay: 100 nsec APTS GPS to PTP Offset: 0 nsec Sync Packet Rate: 1
Delay Packet Rate: 1
```

```
#sh ptp clock 0 dataset
Default Dataset:
  Two Step Flag               : No
  Clock Identity              : E8:C5:7A:FF:FE:8F:B4:31
  Number Of Ports             : 3
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 0
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535

Current Dataset:
  Steps Removed               : 1
  Offset From Master          : 29492 nsec
  Mean Path Delay             : 3075 nsec

Parent Dataset:
  Parent Port ID              :
    Clock Identity            : 00:00:00:00:00:00:00:01
    Port Number               : 1
  Parent Stats                : No
  Observed Parent O.S.L.V     : 65535 (Offset Scaled Log Variance)
```

```
  Observed Parent P.C.R.      : 2147483647 (Phase Change Rate)
  Grandmaster Identity        : 00:00:00:00:00:00:00:01
  Grandmaster Priority1       : 128
  Grandmaster Priority2       : 128
  Grandmaster Clock Quality   :
    Clock Class               : 165
    Clock Accuracy            : 32
    Offset ScaledLogVariance  : 0

Time Dateset:
  Current UTC Offset Valid    : True
  Current UTC Offset          : 37
  Leap 59                     : False
  Leap 61                     : False
  Time Traceable              : True
  Frequency Traceable         : True
  PTP Timescale               : True
  Time Source                 : Atomic clock
    Time of Day                 : Mon 11 Jul 2022 11:15:16 UTC
```

```
   #sh ptp clock 0 port
Port 1:
  Port State                  : Slave
  Port Identity               : E8:C5:7A:FF:FE:8F:B4:31:00:01
  Peer Mean Path Delay        : 3073
  Log Announce Interval       : 1
  Log Min Delay Req Interval  : 0
  Log Sync Interval           : 0
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 0
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : xe0
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300
  Configured delay asymmetry  : 0 nsec

  Number of Foreign Masters   : 1
  Current Foreign Master      : 0
```

```
  Foreign Master #0
  IPv4 Address                : 192.168.5.101
  Grandmaster clockIdentity   : 00:00:00:00:00:00:00:01
  Port ID                     : 00:00:00:00:00:00:00:01:00:01
  clockClass                  : 6
  Clock accuracy              : 32
  Offset scaled log variance  : 0
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 1

  Received Packets            : 96
  Discarded Packets           : 6
  Transmitted Packets         : 37

  Peer #0
  IPv4 Address                : 192.168.5.101
  Clock Identity              : 00:00:00:00:00:00:00:01
  Received Announce           : 20
  Received Sync               : 39
  Received Delay Response     : 34
  Received Signalling         : 3
  Transmitted Delay Request   : 34
  Transmitted Signalling      : 3

  Master #0                   :  192.168.5.101
```

SW1

```
#show ptp servo
PTP servo status for clock 0
Servo Config: Freq + Phase Correction
Servo State: Time Locked
Servo State Duration: 00:03:24
Servo APTS Mode: GPS Frequency Correction: -9.900 ppb Phase Correction: 0.000 nsec
Offset From Master     : 0.000 nsec
Mean Path Delay             : 0 nsec
APTS GPS to PTP Offset   : 0 nsec
Sync Packet Rate            : 0
Delay Packet Rate           : 0


#sh ptp clock 0 dataset
Default Dataset:
  Two Step Flag             : No
  Clock Identity            : E8:C5:7A:FF:FE:8F:B4:31
  Number Of Ports           : 3
  Priority1                 : 128
  Priority2                 : 128
  Slave Only                : No
  Local Priority            : 128
```

```
  Max Steps Removed           : 255
  Domain Number               : 0
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535

Current Dataset:
  Steps Removed               : 1
  Offset From Master          : -24 nsec
  Mean Path Delay             : 3080 nsec

Parent Dataset:
  Parent Port ID              :
    Clock Identity            : 00:00:00:00:00:00:00:01
    Port Number               : 1
  Parent Stats                : No
  Observed Parent O.S.L.V     : 65535 (Offset Scaled Log Variance)
  Observed Parent P.C.R.      : 2147483647 (Phase Change Rate)
  Grandmaster Identity        : 00:00:00:00:00:00:00:01
  Grandmaster Priority1       : 128
  Grandmaster Priority2       : 128
  Grandmaster Clock Quality   :
    Clock Class               : 6
    Clock Accuracy            : 32
    Offset ScaledLogVariance  : 0

Time Dateset:
  Current UTC Offset Valid    : True
  Current UTC Offset          : 37
  Leap 59                     : False
  Leap 61                     : False
  Time Traceable              : True
  Frequency Traceable         : True
  PTP Timescale               : True
  Time Source                 : Atomic clock
  Time of Day                 : Mon 11 Jul 2022 11:07:31 UTC

#sh ptp clock 0 port
Port1:
   Port State                  : Slave
   Port Identity               : E8:C5:7A:FF:FE:69:4D:1A:00:01
   Peer Mean Path Delay        : 0
   Log Announce Interval   : 1
   Log Min Delay Req Interval  : 0
   Log Sync Interval            :0
   Announce Receipt Timeout: 3
Delay Mechanism: End to end
Version Number: 2
Local Priority: 0
```

```
Master only: False
Signal Fail: False
Network Interface: gps
Vlan Configured:
Description:
TTL : 64
DSCP: 56
Unicast Grant Duration: 300
Configured delay asymmetry : 0 nsec
Received Packets: 0
Discarded Packets: 0
Transmitted Packets: 0

Port 2:
Port State: Master
Port Identity: E8:C5:7A:FF:FE:69:4D:1A:00:02
Peer Mean Path Delay: 0
Log Announce Interval   : 1
Log Min Delay Req Interval : 0
Log Sync Interval:0
Announce Receipt Timeout  : 3
Delay Mechanism: End to end
Version Number: 2
Local Priority: 128
Master only: True
Signal Fail: False
Network Interface: xe6
Vlan Configured:
Description:
TTL : 64
DSCP: 56
Unicast Grant Duration: 300
Configured delay asymmetry  : 0 nsec
Received Packets: 299
Discarded Packets: 0
Transmitted Packets: 744

Peer #0
IPv4 Address: 192.168.4.100
Clock Identity:e8:c5:7a:ff:fe:5c:77:6c
Received Delay Request: 293
Received Signalling: 6
Transmitted Announce: 149
Transmitted Sync: 296
Transmitted Delay Response  : 293
Transmitted Signalling: 6

Slave #0
IPv4 Address: 192.168.4.100
Clock Identity: e8:c5:7a:ff:fe:5c:77:6c
```

```
Delay Mechanism: End to end
log Announce Interval: 1
log Sync Interval: 0
Log Delay Req Interval: 0
```

Note: Use show ptp stats to collect the PTP statistics and use clear ptp stats to clear the same.

CHAPTER 6 PTP IWF Profile Configuration

This chapter shows how to configure an Interworking function (IWF) Profile Configuration. IWF can translate between different profiles used on different network segments. OcNOS supports maximum 2 PTP instances, and instance 0 is always the master instance or instance with slave PTP ports (servo instance). Instance 1 can only have PTP ports as master and doesn't have a servo.

Topology

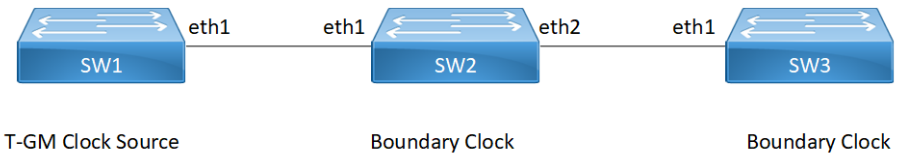


Figure 6-8: PTP IWF Profile Configuration

In this example, SW2 receives G.8275.1 clock from SW1 (T-GM), and after the translation, it sends G.8275.2 clock to SW3.

PTP IWF Profile Configuration

This section shows how to set up an IWF profile configuration.

SW2 (Boundary Clock)

`#configure terminal`	Enter Configure mode
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#exit`	Exit Synce mode
`(config)#interface eth1`	Configure interface ge14
`(config-if)# synce`	Enter configure Synchronous Ethernet mode.
`(config-synce-if)# mode synchronous`	Configure synchronous mode
`(config-synce-if)# input-source 2`	Configure the interface as an input source with priority 2
`(config-synce-if)# wait-to-restore 1`	Configure Wait-to-Restore timer.
`(config-synce-if)# exit`	Exit synce Configure mode.
`(config-if)# exit`	Exit port Configure mode.
`(config)# interface eth2`	Configure interface eth2
`(config-if)# ip address 192.168.4.100/24`	Configure the IP address of the interface.
`(config-if)# exit`	Exit from the Configure mode
`(config-if)# commit`	Commit the configuration
`(config)#ptp clock 0 profile g8275.1`	Enables G8275.1 for PTP time/phase telecom profile
`(config-ptp-clk)#number-ports 2`	Configure the number of PTP ports on the instance
`(config-ptp-clk)#clock-port 1`	Configure PTP port
`(config-clk-port)#network-interface eth1`	Configure underlying interface that is used by this PTP Port
`(config-clk-port)# commit`	Commit the configuration
`(config-clk-port)# end`	Exit from configure mode

#configure terminal	Enter Configure mode
(config)#ptp clock 1 profile g8275.2	Enables G8275.2 for PTP time/phase telecom profile
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance
(config-ptp-clk)#clock-port 2	Configure PTP port
(config-clk-port)#transport ipv4	Set transport type ipv4
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port
(config-clk-port)# commit	Commit the configuration
(config-clk-port)# end	Exit from configure mode

Validation

SW2

```
 #sh ptp clock 0
PTP Clock Profile             : g8275.1
Default Dataset:
  Two Step Flag               : No
  Clock Identity              : E8:C5:7A:FF:FE:8F:CA:97
  Number Of Ports             : 2
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 24
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535

Current Dataset:
  Steps Removed               : 2
  Offset From Master          : 1 nsec
  Mean Path Delay             : -74 nsec

Parent Dataset:
  Parent Port ID              :
    Clock Identity            : E8:C5:7A:FF:FE:9F:20:37
    Port Number               : 2
  Parent Stats                : No
  Observed Parent O.S.L.V     : 65535 (Offset Scaled Log Variance)
  Observed Parent P.C.R.      : 2147483647 (Phase Change Rate)
  Grandmaster Identity        : E8:C5:7A:FF:FE:9F:20:37
  Grandmaster Priority1       : 128
  Grandmaster Priority2       : 128
  Grandmaster Clock Quality   :
    Clock Class               : 6
    Clock Accuracy            : 33
```

```
    Offset ScaledLogVariance  : 20061

Time Dateset:
  Current UTC Offset Valid    : True
  Current UTC Offset          : 37
  Leap 59                     : False
  Leap 61                     : False
  Time Traceable              : True
  Frequency Traceable         : True
  PTP Timescale               : True
  Time Source                 : Global positioning system
  Time of Day                 : Fri 15 Jul 2022 17:58:27 IST

#sh ptp clock 1
PTP Clock Profile             : g8275.2
Default Dataset:
  Two Step Flag               : No
  Clock Identity              : E8:C5:7A:FF:FE:8F:CA:98
  Number Of Ports             : 2
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 44
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535

Current Dataset:
  Steps Removed               : 0
  Offset From Master          : 0 nsec
  Mean Path Delay             : 0 nsec

Parent Dataset:
  Parent Port ID              :
    Clock Identity            : E8:C5:7A:FF:FE:8F:CA:98
    Port Number               : 0
  Parent Stats                : No
  Observed Parent O.S.L.V     : 65535 (Offset Scaled Log Variance)
  Observed Parent P.C.R.      : 2147483647 (Phase Change Rate)
  Grandmaster Identity        : E8:C5:7A:FF:FE:9F:20:37
  Grandmaster Priority1       : 128
  Grandmaster Priority2       : 128
  Grandmaster Clock Quality   :
    Clock Class               : 6
    Clock Accuracy            : 33
    Offset ScaledLogVariance  : 20061
```

```
Time Dateset:
  Current UTC Offset Valid    : True
  Current UTC Offset          : 37
  Leap 59                     : False
  Leap 61                     : False
  Time Traceable              : True
  Frequency Traceable         : True
  PTP Timescale               : True
  Time Source                 : Global positioning system
  Time of Day                 : Fri 15 Jul 2022 17:58:29 IST

#sh ptp clock 0 port
Port 1:
  Port State                  : Slave
  L2 Destination Mac          : 01:1B:19:00:00:00
  Port Identity               : E8:C5:7A:FF:FE:8F:CA:97:00:01
  Peer Mean Path Delay        : -73
  Log Announce Interval       : -3

  Log Min Delay Req Interval  : -4
  Log Sync Interval           : -4
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : xe16
  Vlan Configured             :
  Description                 :
  Configured delay asymmetry  : 0 nsec

  Number of Foreign Masters   : 1
  Current Foreign Master      : 0

  Foreign Master #0
  L2 Address                  : e8:c5:7a:88:17:4d
  Grandmaster clockIdentity   : E8:C5:7A:FF:FE:9F:20:37
  Port ID                     : E8:C5:7A:FF:FE:9F:20:37:00:01
  clockClass                  : 6
  Clock accuracy              : 33
  Offset scaled log variance  : 20061
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 2

  Received Packets            : 13788
  Discarded Packets           : 8
  Transmitted Packets         : 5522
```

```
#sh ptp clock 1 port
Port 2:
  Port State                  : Master
  Port Identity               : E8:C5:7A:FF:FE:8F:CA:98:00:02
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Log Min Delay Req Interval  : -6
  Log Sync Interval           : -6
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : True
  Signal Fail                 : False
  Network Interface           : xe23
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300
  Configured delay asymmetry  : 0 nsec

  Received Packets            : 13247
  Discarded Packets           : 0
  Transmitted Packets         : 28446

  Peer #0
  IPv4 Address                : 192.168.4.101
  Clock Identity              : b8:6a:97:ff:fe:f5:ea:c4
  Received Delay Request      : 13241
  Received Signalling         : 6
  Transmitted Announce        : 1693
  Transmitted Sync            : 13506
  Transmitted Delay Response  : 13241
  Transmitted Signalling      : 6

  Slave #0
  IPv4 Address                : 192.168.4.101
  Clock Identity              : b8:6a:97:ff:fe:f5:ea:c4
  Delay Mechanism             : End to end
  log Announce Interval       : -3
  log Sync Interval           : -6
  Log Delay Req Interval      : -6

#sh ptp clock 0 stats
clock 0:
  Number of ports             : 32
  Received Packets            : 14898
  Discarded Packets           : 8
  Received IPv4 PTP Packets   : 0
```

```
  Received IPv6 PTP Packets   : 0
  Received L2 PTP Packets     : 14898
  RX Queue Overflows          : 0
  Transmitted Packets         : 5966

Port 1:
  Received Packets            : 14898
  Discarded Packets           : 8
  Transmitted Packets         : 5966


#sh ptp clock 1 stats
clock 1:
  Number of ports             : 32
  Received Packets            : 15991
  Discarded Packets           : 0
  Received IPv4 PTP Packets   : 15991
  Received IPv6 PTP Packets   : 0
  Received L2 PTP Packets     : 0
  RX Queue Overflows          : 0
  Transmitted Packets         : 34252

Port 2:
  Received Packets            : 15991
  Discarded Packets           : 0
  Transmitted Packets         : 34252
```

CHAPTER 7 PTP G.8275.2 Profile Source IP as Loopback Configuration

This chapter shows how to configure a Precision Time Protocol (PTP) G.8275.2 profile source IP as loopback over IPv4 and IPv6. This feature allows to configure Telecom Grandmaster (T-GM) and boundary clock. The boundary clock can have more than one port but the configuration of TGM to the boundary clock can be done in a single port at a time. Telecom grandmaster device sets the time for the boundary clock devices.

PTP G.8275.2 Loopback Topology

In the below example, the R1 and R2 are running PTP. R1 is acting as T-GM and R2 is acting as a boundary clock.

The R1 is the master clock and sets the boundary clock timing.

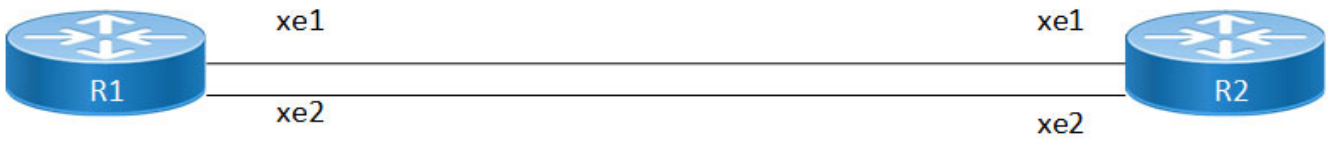


Figure 7-9: Configuration Topology

G8275.2 Profile Source IP as Loopback Configuration

This section shows how to set up a G.8275.2 Profile with loopback using as source IP.

R1 (TGM)

`R1#configure terminal`	Enter configure mode.
`R1(config)#interface lo`	Configure loopback interface.
`R1(config-if)#ip address 1.1.1.1/32 secondary`	Configure the IP address `1.1.1.1/32` of the loopback interface.
`R1(config-if)#interface xe1`	Configure interface `xe1`.
`R1(config-if)#ip address 192.168.4.101/24`	Configure the IP address `192.168.4.101/24` of the interface.
`R1(config-if)#interface xe2`	Configure interface `xe2`.
`R1(config-if)#ip address 10.1.1.1/24`	Configure the IP address `10.1.1.1/24` of the interface.
`R1(config-if)#exit`	Exit interface mode.
`R1(config)#ptp clock 0 profile g8275.2`	Enables G8275.2 for PTP time or phase telecom profile.
`R1(config-ptp-clk)#number-ports 2`	Configure the number of PTP ports on the instance.
`R1(config-ptp-clk)#clock-port 1`	Configure the PTP clock-port number 1 for creating source address on the PTP instance.
`R1(config-clk-port)#transport ipv4`	Set the transport type as IPv4.
`R1(config-clk-port)#source-address ipv4 interface lo`	Configure the underlying loopback source interface that is used by this PTP port.

`R1(config-clk-port)#network-interface xe1`	Configure the underlying interface that is used by this PTP port.
`R1(config-clk-port)#exit`	Exit PTP clock port mode.
`R1(config-ptp-clk)#clock-port 2`	Configure the PTP clock-port number 2 for creating source address on the PTP instance.
`R1(config-clk-port)#transport ipv4`	Set the transport type as IPv4.
`R1(config-clk-port)#source-address ipv4 interface lo`	Configure the underlying loopback source interface that is used by this PTP Port.
`R1(config-clk-port)#network-interface xe2`	Configure the underlying interface that is used by this PTP Port.
`R1(config-clk-port)#exit`	Exit PTP clock port mode.

R2 (Boundary clock)

`R2#configure terminal`	Enter configure mode.
`R2(config)#interface xe1`	Configure interface `xe1`.
`R2(config-if)#ip address 192.168.4.100/24`	Configure the IP address `192.168.4.100/24` of the interface.
`R2(config-if)#interface lo`	Configure interface loopback.
`R2(config-if)#ip address 2.2.2.2/32 secondary`	Configure the loopback IP address `2.2.2.2/32` of the interface.
`R2(config)#interface xe2`	Configure interface `xe2`.
`R2(config-if)#ip address 10.1.1.2/24`	Configure the IP address `10.1.1.2/24` of the interface.
`R2(config-if)#exit`	Exit interface mode.
`R2(config-if)#ip route 1.1.1.1/32 192.168.4.101`	Configure the static route destination address as `1.1.1.1/32` and nexthop is `192.168.4.101` to reach other network.
`R2(config-if)#ip route 1.1.1.1/32 10.1.1.1`	Configure the static route destination address as 1.1.1.1/32 and nexthop is `10.1.1.1` to reach other network.
`R2(config-if)#exit`	Exit interface mode.
`R2(config)#ptp clock 0 profile g8275.2`	Enables G8275.2 for PTP time or phase telecom profile.
`R2(config-ptp-clk)#number-ports 3`	Configure the number of PTP ports on the instance.
`R2(config-ptp-clk)#clock-port 1`	Configure the PTP clock-port number 1 for creating source address on the PTP instance.
`R2(config-clk-port)#transport ipv4`	Set the transport type as IPv4.
`R2(config-clk-port)#network-interface xe1`	Configure underlying interface that is used by this PTP port.
`R2(config-clk-port)#master ipv4 1.1.1.1`	Set master clock source address `1.1.1.1` using loopback IP.
`R2(config-clk-port)#exit`	Exit PTP clock port mode.
`R2(config-ptp-clk)#clock-port 2`	Configure the PTP clock-port number 2 for creating source address on the PTP instance.
`R2(config-clk-port)#transport ipv4`	Set the transport type as IPv4.
`R2(config-clk-port)#network-interface xe2`	Configure underlying interface that is used by this PTP port.
`R2(config-clk-port)#master ipv4 1.1.1.1`	Set master clock source address `1.1.1.1`.
`R2(config-clk-port)#exit`	Exit PTP clock port mode.

Validation

R1

Verify the port state on R1:

```
R1#show ptp clock 0 port
Port 1:
  Port State                  : Master
  Port Identity               : E8:C5:7A:FF:FE:02:A0:3C:00:02
  Log Min Delay Req Interval  : -6
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Announce Receipt Timeout    : 3
  Log Sync Interval           : -6
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : xe1
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300

  Received Packets            : 51476
  Discarded Packets           : 0
  Transmitted Packets         : 109804

  Peer #0
  IPv4 Address                : 10.1.1.2
  Clock Identity              : 00:00:00:00:00:00:00:02
  Received Delay Request      : 51485
  Received Signalling         : 18
  Transmitted Announce        : 6436
  Transmitted Sync            : 51902
  Transmitted Delay Response  : 51485
  Transmitted Signalling      : 18

  Slave #0
  IPv4 Address                : 10.1.1.2
  Clock Identity              : 00:00:00:00:00:00:00:02
  Delay Mechanism             : End to end
  log Announce Interval       : -3
  log Sync Interval           : -6
  Log Delay Req Interval      : -6
```

R2

Verify the port state on R2:

```
R2#show ptp clock 0 port
Port 1:
  Port State                  : Slave
  Port Identity               : E8:C5:7A:FF:FE:02:A0:3C:00:01
  Log Min Delay Req Interval  : -6
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Announce Receipt Timeout    : 3
  Log Sync Interval           : -6
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : xe1
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300

  Number of Foreign Masters   : 1
  Current Foreign Master      : 0

  Foreign Master #0
  IPv4 Address                : 1.1.1.1
  Grandmaster clockIdentity   : 00:00:00:00:00:00:00:01
  Port ID                     : 00:00:00:00:00:00:00:01:00:01
  clockClass                  : 6
  Clock accuracy              : 33
  Offset scaled log variance  : 20061
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 0
  PDV Scaled Allan Variance   : 5

  Received Packets            : 109666
  Discarded Packets           : 0
  Transmitted Packets         : 51821

  Peer #0
  IPv4 Address                : 1.1.1.1
  Clock Identity              : 00:00:00:00:00:00:00:01
  Received Announce           : 6435
  Received Sync               : 51415
  Received Delay Response     : 51825
  Received Signalling         : 18
```

```
  Transmitted Delay Request   : 51825
  Transmitted Signalling      : 38

  Master #0                   : 1.1.1.1
```

Verify the ptp servo on R2:

```
#show ptp servo
PTP servo status for clock 0
  Servo Config                : Freq + Phase Correction
  Servo State                 : Time Locked
  Servo State Duration        : 00:13:33
  Servo APTS Mode             : PTP
  Frequency Correction        : -0.674 ppb
  Phase Correction            : 0.000 nsec
  Offset From Master          : 10.000 nsec
  Mean Path Delay             : 3060 nsec
  APTS GPS to PTP Offset      : 0 nsec
  Sync Packet Rate            : 64
  Delay Packet Rate           : 65
```

Note: Use show ptp stats to collect the PTP statistics and use clear ptp stats to clear the same.

CHAPTER 8 PTP SMPTE Profile Configuration

Overview

The IEEE 1588 v2 Precision Time Protocol (PTP) functionality is enhanced to support the Society of Motion Picture and Television Engineers (SMPTE) 2059-2 in OcNOS-SP 6.4.2.

The PTP is a protocol used to synchronize timing among the systems connected in computer networks; it is similar to Network Time Protocol (NTP), which does not have the capability to measure in nanoseconds. The timing capability to measure less than a microsecond is critical while broadcasting multimedia data such as audio, video, etc. The PTP is essential in scenarios where very accurate timing is required.

Currently, the PTP implementation is supported with the following profiles:

- ITU-T G.8275.1
- G.8275.2,
- G.8265.1
- Boundary Clock
- Interworking function (IWF)
- Synchronous Ethernet
- End-to-End (E2E) telecom profile for time/phase synchronization

For more information on existing PTP profiles support refer to *Timing and Synchronization Guide*.

Feature Characteristics

This section describes the PTP SMPTE 2059-2 time and frequency synchronization profile functionalities.

In a computer network, a system installed with a PTP module is called a Grand Master Clock, which performs the timing and synchronization with the other connected systems, called a Slave Clock. The PTP modules can include many timing profiles according to the functionality requirements.

The SMPTE PTP profile is based on IEEE Standard 1588-2008 and includes a description of parameters, their default values, and permitted ranges. This standard specifies a PTP for synchronizing audio/video equipment in a professional broadcast environment.

The SMPTE ST 2059-2 profile defines a point in time, the SMPTE Epoch, which is used for the alignment of real-time signals; formulae that specify the ongoing alignment of signals to time since the SMPTE Epoch; and formulae that specify the calculation of SMPTE ST 12-1 time address values and SMPTE ST 309 date values.

The SMPTE enhanced profile includes the following functionality:

- Implements appropriate algorithm to compare clocks and determines the best clock to use as a source clock
- Implements appropriate configuration management options
- Implements the appropriate path delay mechanisms, delay request-response or peer delay
- Defines the range and default values of all PTP configurable attributes and data set members.
- Defines the transport mechanisms as required, permitted, or prohibited.
- Defines the node types as required, permitted, or prohibited.

Limitations:

- The SMPTE timing profile is supported only on UFI-QUX and UFI-Q2 platforms.
- The new CLI `Priority1` command is supported only on Default and SMPTE profiles

Benefits

The SMPTE PTP Profile is used for time and frequency synchronization in a professional multimedia broadcast environment. It provides the following benefits:

- To permit clocks to be synchronized quickly and accurately to enable professional media over IP applications.
- To convey Synchronization Metadata (SM) required for synchronization and time labeling of audio/video signals.

Prerequisites

The PTP process should be up and running.

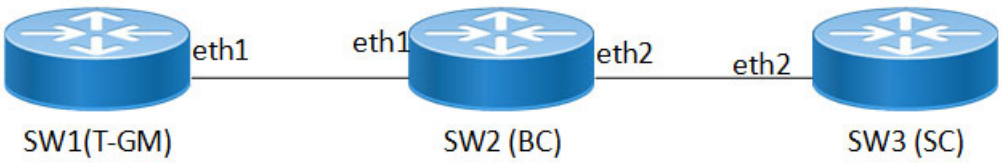
Configuration

This chapter shows how to configure a PTP SMPTE profile over IPv4 and IPv6. You can configure T-GM and boundary clock with more than one port.S

Note: The SMPTE profile can be enabled on L2/L3 physical interfaces, Sub interfaces, LAG interfaces and VLAN interfaces.

Topology

Describe the topology



SMPTE PTP Configuration Toplogy

In this example, SW1, SW2 and SW3 are running PTP. SW1 acting as T-GM, SW2 as a boundary clock and SW3 as a slave clock.

SW1 Telecom Grandmaster (T-GM)

Perform the following configurations to set T-GM clock.

`#configure terminal`	Enter Configure mode
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#synchronization option 1`	Set the synchronization network type.
`(config-synce)#exit`	Exit Synce mode.

(config)#synce-interface gps	Configure synce interface GPS.
(config-synce-if)#mode synchronous	Configure synchronous mode.
(config-synce-if)#input-source 1	Configure the interface as an input source with priority 1.
(config-synce-if)#quality-level QL_PRC	Configure QL-value.
(config-synce-if)#wait-to-restore 1	Configure Wait-to-Restore timer.
(config-synce-if)#exit	Exit Port Configure mode.
(config)#interface eth1	Configure interface eth2.
(config-if)#ip address 192.168.4.101/24	Configure the IP address of the interface.
(config-if)#exit	Exit interface mode.
(config)#ptp clock 0 profile smpte	Enables smpte PTP profile.
(config)# sm-tlv default-frame-rate 4294967295 4294967294	Enables sm tlv colour frame rate value.
(config)# sm-tlv time-address-flags color-frame	Enables sm-tlv time flag as color frame.
(config)# sm-tlv time-address-flags drop-frame	Enables sm-tlv time flag as drop frame.
(config-ptp-clk)#clock-type tgm	Enables clock type as T-GM.
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance.
(config-ptp-clk)#clock-port 2	Configure PTP port.
(config-clk-port)#transport ipv4-multicast	Set the transport type as IPv4 multicast.
(config-clk-port)#network-interface eth1	Configure underlying interface that is used by this PTP Port.
(config-clk-port)#exit	Exit PTP clock port mode.
(config-ptp-clk)#clock-port 1	Configure PTP port.
(config-clk-port)#network-interface gps	Configure underlying interface that is used by this PTP Port.
(config-clk-port)#exit	Exit PTP clock port mode.

SW2 Boundary Clock (BC)

Perform the following configuration to set Boundary clock. It can function as both Grand Master and Slave to another PTP clock.

#configure terminal	Enter Configure mode.
(config)#interface eth1	Configure interface eth1.
(config-if)#ip address 192.168.4.100/24	Configure the IP address of the interface.
(config)#interface eth2	Configure interface eth1.
(config-if)#ip address 192.168.5.100/24	Configure the IP address of the interface.
(config)#ptp clock 0 profile smpte	Enables SMPTE for PTP time/phase telecom profile.
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance.
(config-ptp-clk)#clock-port 1	Configure PTP port.
(config-clk-port)#transport ipv4-multicast	Set transport type IPv4 as multicast.

(config-clk-port)#network-interface eth1	Configure underlying interface that is used by this PTP Port.
(config-ptp-clk)#clock-port 2	Configure PTP port.
(config-clk-port)#transport ipv4-multicast	Set transport type IPv4 as multicast.
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port.
(config-clk-port)#exit	Exit PTP clock port mode.

SW3 Slave Clock (SC)

Perform the following configuration to set Slave clock.

#configure terminal	Enter Configure mode.
(config)#interface eth2	Configure interface eth2.
(config-if)#ip address 192.168.5.101/24	Configure the IP address of the interface.
(config-if)#exit	Exit interface mode.
(config)#ptp clock 0 profile smpte	Enables SMPTE PTP profile.
(config-ptp-clk)#number-ports 2	Configure the number of PTP ports on the instance.
(config-ptp-clk)#slave-only	Configure the device as a Slave clock.
(config-ptp-clk)#clock-port 1	Configure PTP port.
(config-clk-port)#transport ipv4-multicast	Set transport type IPv4 as multicast.
(config-clk-port)#network-interface eth2	Configure underlying interface that is used by this PTP Port.
(config-clk-port)#exit	Exit PTP clock port mode.

Validation

SW2(BC)

```
#show ptp clock 0
PTP Clock Profile             : smpte
Default Dataset:
  Two Step Flag               : No
  Clock Identity              : 5C:07:58:FF:FE:54:12:02
  Number Of Ports             : 2
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 127
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535

Current Dataset:
```

```
  Steps Removed               : 1
  Offset From Master          : -5318 nsec
  Mean Path Delay             : 89 nsec

Parent Dataset:
  Parent Port ID              :
    Clock Identity            : 5C:07:58:FF:FE:51:13:09
    Port Number               : 2
  Parent Stats                : No
  Observed Parent O.S.L.V     : 65535 (Offset Scaled Log Variance)
  Observed Parent P.C.R.      : 2147483647 (Phase Change Rate)
  Grandmaster Identity        : 5C:07:58:FF:FE:51:13:09
  Grandmaster Priority1       : 128
  Grandmaster Priority2       : 128
  Grandmaster Clock Quality   :
    Clock Class               : 248
    Clock Accuracy            : 32
    Offset ScaledLogVariance  : 20061

Time Dateset:
  Current UTC Offset Valid    : True
  Current UTC Offset          : 37
  Leap 59                     : False
  Leap 61                     : False
  Time Traceable              : True
  Frequency Traceable         : True
  PTP Timescale               : True
  Time Source                 : Global positioning system
  Time of Day                 : Fri 10 Nov 2023 07:52:31 UTC
```

2. show ptp clock 0 port 1

```
Port 1:
  Port State                  : Slave
  Port Identity               : 5C:07:58:FF:FE:54:12:02:00:01
  Peer Mean Path Delay        : 89
  Log Announce Interval       : 0
  Log Min Delay Req Interval  : -3
  Log Sync Interval           : -3
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : cd20/1
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300
```

```
  Configured delay asymmetry  : 0 nsec

  Number of Foreign Masters   : 1
  Current Foreign Master      : 0

  Foreign Master #0
  IPv4 Address                : 192.168.4.100
  Grandmaster clockIdentity   : 5C:07:58:FF:FE:51:13:09
  Port ID                     : 5C:07:58:FF:FE:51:13:09:00:02
  clockClass                  : 6
  Clock accuracy              : 32
  Offset scaled log variance  : 20061
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 1

  Received Packets            : 20087
  Discarded Packets           : 74
  Transmitted Packets         : 8929

  Peer #0
  IPv4 Address                : 192.168.4.100
  Clock Identity              : 5c:07:58:ff:fe:51:13:09
  Received Announce           : 1115
  Received Sync               : 8926
  Received Delay Request      : 41
  Received Delay Response     : 8894
  Received Management         : 1111
  Transmitted Announce        : 4
  Transmitted Sync            : 28
  Transmitted Delay Request   : 8894
  Transmitted Management      : 3

  SMPTE Sync Metadata:
  Default frame rate          : 0xfffffffffffffffe
  GM Lock Status              : 4
  Time Address Flags          : 0x03
  Current Local Offset        : -37
  Jump Seconds                : 0
  Time of Next Jump           : 0x000000000000
  Time of Next Jam            : 0x000000000000
  Time of Previous Jam        : 0x000000000000
  Previous Jam Local Offset   : 0
  Daylight Saving             : 0x00
  Leap Second Jump            : 0x00

  Master #0                   : 192.168.4.100
```

3. show ptp servo

```
PTP servo status for clock 0
```

```
  Servo Config                : Freq + Phase Correction
  Servo State                 : Time Locked
  Servo State Duration        : 00:00:28
  Servo APTS Mode             : N/A
  Frequency Correction        : 24.887 ppb
  Phase Correction            : -370500000.000 nsec
  Offset From Master          : -317 nsec
  Mean Path Delay             : 89 nsec
  APTS GPS to PTP Offset      : N/A
  Sync Packet Rate            : 8
  Delay Packet Rate           : 8
```

SW3(Slave clock)

1.show ptp clock 0

```
PTP Clock Profile             : smpte
Default Dataset:
  Two Step Flag               : No
  Clock Identity              : E8:C5:7A:FF:FE:DA:68:CF
  Number Of Ports             : 1
  Priority1                   : 128
  Priority2                   : 255
  Slave Only                  : Yes
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 127
  Clock Quality               :
    Clock Class               : 255
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535

Current Dataset:
  Steps Removed               : 0
  Offset From Master          : 0 nsec
  Mean Path Delay             : 0 nsec

Parent Dataset:
  Parent Port ID              :
    Clock Identity            : E8:C5:7A:FF:FE:DA:68:CF
    Port Number               : 0
  Parent Stats                : No
  Observed Parent O.S.L.V     : 65535 (Offset Scaled Log Variance)
  Observed Parent P.C.R.      : 2147483647 (Phase Change Rate)
  Grandmaster Identity        : E8:C5:7A:FF:FE:DA:68:CF
  Grandmaster Priority1       : 128
  Grandmaster Priority2       : 255
  Grandmaster Clock Quality   :
    Clock Class               : 255
    Clock Accuracy            : 254
```

```
    Offset ScaledLogVariance  : 65535

Time Dateset:
  Current UTC Offset Valid    : True
  Current UTC Offset          : 37
  Leap 59                     : False
  Leap 61                     : False
  Time Traceable              : False
  Frequency Traceable         : False
  PTP Timescale               : True
  Time Source                 : Internal Oscillator
  Time of Day                 : Thu 01 Jan 1970 00:05:58 UTC
```

2.show ptp clock 0 port 1

```
Port 1:
  Port State                  : Slave
  Port Identity               : E8:C5:7A:FF:FE:DA:68:CF:00:01
  Peer Mean Path Delay        : 2974
  Log Announce Interval       : 0
  Log Min Delay Req Interval  : -3
  Log Sync Interval           : -3
  Announce Receipt Timeout    : 3
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : ce2
  Vlan Configured             :
  Description                 :
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300
  Configured delay asymmetry  : 0 nsec

  Number of Foreign Masters   : 1
  Current Foreign Master      : 0

  Foreign Master #0
  IPv4 Address                : 192.168.4.100
  Grandmaster clockIdentity   : 5C:07:58:FF:FE:51:13:09
  Port ID                     : 5C:07:58:FF:FE:51:13:09:00:02
  clockClass                  : 6
  Clock accuracy              : 32
  Offset scaled log variance  : 20061
  priority1                   : 128
  priority2                   : 128
  Steps removed               : 1

  Received Packets            : 210
```

```
  Discarded Packets           : 33
  Transmitted Packets         : 82

  Peer #0
  IPv4 Address                : 192.168.4.100
  Clock Identity              : 5c:07:58:ff:fe:51:13:09
  Received Announce           : 15
  Received Sync               : 114
  Received Delay Response     : 82
  Transmitted Delay Request   : 82

  Master #0                   : 192.168.4.100
```

3. show ptp servo

```
PTP servo status for clock 0
  Servo Config                : Freq + Phase Correction
  Servo State                 : Time Locked
  Servo State Duration        : 00:01:09
  Servo APTS Mode             : N/A
  Frequency Correction        : -11.610 ppb
  Phase Correction            : -86000000.000 nsec
  Offset From Master          : -4 nsec
  Mean Path Delay             : -52 nsec
  APTS GPS to PTP Offset      : N/A
  Sync Packet Rate            : 8
  Delay Packet Rate           : 8
```

SW1(T-GM)

1. show ptp servo

```
PTP servo status for clock 0
  Servo Config                : Freq + Phase Correction
  Servo State                 : Time Locked
  Servo State Duration        : 00:11:16
  Servo APTS Mode             : GPS
  Frequency Correction        : -234.160 ppb
  Phase Correction            : 0.000 nsec
  Offset From Master          : 0 nsec
  Mean Path Delay             : 0 nsec
  APTS GPS to PTP Offset      : N/A
  Sync Packet Rate            : 8
  Delay Packet Rate           : 8
```

2. show ptp clock 0

```
PTP Clock Profile             : smpte
Default Dataset:
  Two Step Flag               : No
  Clock Identity              : 5C:07:58:FF:FE:51:13:09
```

```
  Number Of Ports             : 2
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 127
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535

Current Dataset:
  Steps Removed               : 0
  Offset From Master          : 0 nsec
  Mean Path Delay             : 0 nsec

Parent Dataset:
  Parent Port ID              :
    Clock Identity            : 5C:07:58:FF:FE:51:13:09
    Port Number               : 0
  Parent Stats                : No
  Observed Parent O.S.L.V     : 65535 (Offset Scaled Log Variance)
  Observed Parent P.C.R.      : 2147483647 (Phase Change Rate)
  Grandmaster Identity        : 5C:07:58:FF:FE:51:13:09
  Grandmaster Priority1       : 128
  Grandmaster Priority2       : 128
  Grandmaster Clock Quality   :
    Clock Class               : 6
    Clock Accuracy            : 32
    Offset ScaledLogVariance  : 20061

Time Dateset:
  Current UTC Offset Valid    : True
  Current UTC Offset          : 37
  Leap 59                     : False
  Leap 61                     : False
  Time Traceable              : True
  Frequency Traceable         : True
  PTP Timescale               : True
  Time Source                 : Global positioning system
  Time of Day                 : Fri 10 Nov 2023 04:33:40 UTC
```

3.show ptp clock 0 port 1

```
Port 1:
  Port State                  : Slave
  Port Identity               : 5C:07:58:FF:FE:51:13:09:00:01
  Peer Mean Path Delay        : 0
  Log Announce Interval       : 0
  Log Min Delay Req Interval  : -3
```

```
Log Sync Interval           : -3
Announce Receipt Timeout    : 3
Delay Mechanism             : Disabled
Version Number              : 2
Local Priority              : 0
Master only                 : False
Signal Fail                 : False
Network Interface           : gps
Vlan Configured             :
Description                 :
TTL                         : 64
DSCP                        : 56
Unicast Grant Duration      : 300
Configured delay asymmetry  : 0 nsec

Received Packets            : 0
Discarded Packets           : 0
Transmitted Packets         : 0
```

Note: Use `show ptp stats` to collect the PTP statistics and use `clear ptp stats` to clear the same.

Implementation Examples

Gather typical use cases for this feature. Your information must include the following:

- Where a customer will enable or disable this feature.
- Cover how the new feature works with other existing features?

Note: Work with SE's and TAC to request and understand customer use cases.

New CLI Commands

Following are the new CLIs introduced in this feature.

- sm-tlv time-address-flags color-frame
- sm-tlv time-address-flags drop-frame
- sm-tlv default-frame-rates
- sm-tlv append disable
- sm-tlv process disable
- transport ipv6-multicast type

sm-tlv time-address-flags color-frame

Use this command to set sm-tlv color frame. Applicable only for smpte profile.

Use the `no` form of this command to unconfigure sm-tlv color-frame.

Command Syntax

```
sm-tlv time-address-flags color-frame
```

```
no sm-tlv time-address-flags color-frame
```

Parameters

None

Default

None

Command Mode

PTP Clock mode

Applicability

This command was introduced in the OcNOS version 6.4.2.

Example

Following is an example to execute the CLI.

```
OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#sm-tlv time-address-flags color-frame

OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#no sm-tlv time-address-flags color-frame
```

sm-tlv time-address-flags drop-frame

Use this command to set sm-tlv drop frame. Applicable only for SMPTE profile.

Use the `no` form of this command to unconfigure sm-tlv drop-frame.

Command Syntax

```
sm-tlv time-address-flags drop-frame
```

```
no sm-tlv time-address-flags drop-frame
```

Parameters

None

Default

None

Command Mode

PTP Clock mode

Applicability

This command was introduced in the OcNOS version 6.4.2.

Example

Following is an example to execute the CLI.

```
OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#sm-tlv time-address-flags drop-frame

OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#no sm-tlv time-address-flags drop-frame
```

sm-tlv default-frame-rates

Use this command to set the default frame rate. Applicable only for SMPTE profile.For example, if the video default frame rate is 30000/1001 Hz, set first argument to numerator value (i.e 30000) and second argument to denominator value (i.e 1001).

Use the `no` form of this command to unconfigure default frame rates.

Command Syntax

```
sm-tlv default-frame-rates <numerator> <denominator>
no sm-tlv default-frame-rates
```

Parameters

`Numerator`	Setting numerator for the default system frame rate
`Denominator`	Setting denominator for the default system frame rate

Default

None

Command Mode

PTP Clock mode

Applicability

This command was introduced in the OcNOS version 6.4.2.

Example

Following is an example to execute the CLI.

```
OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)# sm-tlv default-frame-rate 30000 1001

OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)# no sm-tlv default-frame-rate
```

sm-tlv append disable

Use this command to disable tlv append. Applicable only for SMPTE profile.

Use the `no` form of this command to unconfigure sm-tlv append disable.

Command Syntax

```
sm-tlv append disable
```

```
[no]sm-tlv append disable
```

Parameters

None

Default

The sm-tlv append is enabled.

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in the OcNOS version 6.4.2.

Example

Following is an example to execute the CLI.

```
OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)#sm-tlv append disable
OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)#no sm-tlv append disable
```

sm-tlv process disable

Use this command to disable tlv processing. Applicable only for smpte profile.

Use the `no` form of this command to unconfigure sm-tlv process disable.

Command Syntax

```
sm-tlv process disable
```

```
no sm-tlv process disable
```

Parameters

None

Default

The sm-tlv process is enabled.

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in the OcNOS version 6.4.2.

Example

Following is an example to execute the CLI.

```
OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)#sm-tlv process disable

OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)#no sm-tlv process disable
```

transport ipv6-multicast type

Use this command to set transport type as ipv6 multicast and we can specify the multicast address type. Applicable for G.8275.2 profile, G 8265.1, SMPTE profile and default profile.

Use the `no` form of this command to unconfigure transport-type.

Command Syntax

```
transport ipv6-multicast type (site-local|interface-local|link-local|admin-
  local|organization-local|global-local)
no transport ipv6-multicast type
```

Parameters

`Site-local` - ff05::181

`interface-local` - ff01::181

`link-local` - ff02::181

`admin-local` - ff04::181

`organization-local` - ff08::181

`global-local` - ff0e::181

Default

None

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in the OcNOS version 6.4.2.

Example

Explain or describe the example.

```
OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)#transport ipv6-multicast type admin-local

OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)#transport ipv6-multicast type global-local
```

```
OcNOS(config)#ptp clock 0 profile smpte
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)#no transport ipv6-multicast type
```

Existing CLI Commands

The following existing CLIs are applicable for SMPT profile.

- announce-receipt-timeout
- dscp
- log-announce-interval
- log-min-delay-req-interval
- log-sync-interval
- master
- source-address linklocal
- source-address interface
- ttl
- unicast-grant-duration

The following existing CLIs are updated for SMPT profile.

- ptp clock profile

For complete CLI command information, refer to PTP Commands section.

Abbreviations

Acronym	Description
OC	Ordinary Clock
BC	Boundary Clock
SMPTE	The Society of Motion Picture and Television Engineers
TC	Transparent Clock
T-GM	Telecom Grandmaster
T-TSC	Telecom Time Slave Clock

Glossary

The following provides definitions for key terms used throughout this document.

SMPTE	The SMPTE ST 2059-2 profile defines a point in time, the SMPTE Epoch, which is used for alignment of real-time signals; formulae which specify the ongoing alignment of signals to time since the SMPTE Epoch; and formulae which specify the calculation of SMPTE ST 12-1 time address values and SMPTE ST 309 date values.
PTP	A protocol that synchronizes clocks throughout a computer network. On a LAN, PTP achieves clock accuracy in the sub-microsecond range, making it suitable for measurement and control systems. The time synchronization is achieved through packets that are transmitted and received in a session between a master clock and a slave clock. Defined by IEEE 1588v2.

Precision Time Protocol Command Reference

CHAPTER 1 PTP Commands

This chapter describes the commands used for Precision Time Protocol (PTP):

1pps-out offset

Use this command to set 1PPS external interface output signal offset in nano seconds.

Use the no form of this command to set default value 0.

Command Syntax

```
1pps-out offset <-2048-2048>
no 1pps-out offset
```

Parameters

`<-2048-2048>`	Offset value in range. Default is 0

Command Mode

PTP Clock Mode

Default

Default offset value is Zero.

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#1pps-out offset 2048
```

announce-receipt-timeout

Use this command to set announce-receipt-timeout. Applicable for only G.8275.2, SMPTE and default profile and G 8265.1.

Use the no form of this command to set default value 3.

Command Syntax

```
announce-receipt-timeout <2-10>
no announce-receipt-timeout
```

Parameters

<2-10>	announceReceiptTimeout range (default is 3)

Command Mode

PTP Clock Port Mode

Default

Default offset value is Zero.

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#announce-receipt-timeout 3
```

clear ptp clock stats

Use this command to clear PTP packet statistics.

Command Syntax

```
clear ptp clock <0-1> stats
```

Parameters

`<0-1>`	Clock 0 or 1

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#clear ptp clock 0 stats
```

clock-accuracy

Use this command to indicate the expected accuracy of the clock.

Use the `no` form of this command in PTP Clock Mode to set the default value 254.

Use the `no` form of this command in PTP Clock Port Mode to set the default value 0x21.

Note: Applicable for Non-Ethernet ports for PTP Clock Port mode.

Command Syntax

```
clock-accuracy <0-255>
no clock-accuracy
```

Parameters

`<0-255>`	A number representing the expected clock accuracy.

Command Mode

PTP Clock Mode

PTP Clock Port Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#clock-accuracy 10

(config-ptp-clk)#clock-port 1
(config-clk-port)#clock-accuracy 15
```

clock-class

Use this command to denote the traceability of the time or frequency distributed by the clock.

Use the `no` form of this command in PTP Clock Mode to set the default value 248.

Use the `no` form of this command in PTP Clock Port Mode to set the default value 6 for clock-port.

Note: Applicable for Non-Ethernet ports for PTP Clock Port mode.

Command Syntax

```
clock-class <0-255>
no clock-class
```

Parameters

`<0-255>`	A number representing the traceability of time or frequency of the clock.

Command Mode

PTP Clock Mode

PTP Clock Port Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#clock-class 3

(config-ptp-clk)#clock-port 1
(config-clk-port)#clock-class 7
```

Clock-port

Use this command to enter PTP Clock Mode.

Use the `no` form of the command to remove the clock-port configuration.Command Syntax

```
clock-port <1-128>
no clock-port <1-128>
```

Parameters

`<1-128>`	Specifies the number of clock ports.

Default

None

Command Mode

PTP Clock Mode

Applicability

Introduced in OcNOS version 3.0. The maximum number of port value is changed to 128 in OcNOS version 6.5.3

Example

Explain or describe the example.

```
#configure terminal
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#clock-port 55
(config-clk-port)#
```

clock-type tgm

Use this command to make a clock a grandmaster clock.

Command Syntax

```
clock-type tgm
```

Parameters

None

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#clock-type tgm
(config-ptp-clk)#number-ports 2
(config-ptp-clk)#clock-port 2
(config-clk-port)#master-only
(config-clk-port)#network-interface eth1
```

delay-asymmetry

Use this command to set asymmetric delay in nanoseconds. The value can be entered as milliseconds or nanoseconds.

Note: Entering a value in both milliseconds and nanoseconds will result in the sum of the two values being set.

Use the `no` form of this command to set default value 0.

Command Syntax

```
delay-asymmetry {msec <-100-100>|nsec <-1000000-1000000>}
no delay-asymmetry
```

Parameters

`msec <-100-100>`

Value of latency in milliseconds.

`nsec <-1000000-1000000>`

Value of latency in nanoseconds.

Command Mode

PTP Clock Port mode

Applicability

This command introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#delay-asymmetry msec 100 nsec 1000000
```

description

Use this command to set description for clock port.

Use the no form of this command to delete this description.

Command Syntax

```
description LINE
no description
```

Parameters

LINE	Clock port description.

Command Mode

PTP Clock Port Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#description l3
```

domain

Use this command to set the current synchronization domain:

- For G.8275.1, domain numbers are in the range of 24 - 43 and the default is 24.
- For G.8275.2, domain numbers are in the range of 44 - 63 and the default is 44.
- For the default profile, domain numbers are in the range of 0-127.
- For G 8265.1, domain numbers are in the range of 4-23.

Command Syntax

```
domain <0-127>
no domain
```

Parameters

<0-127>	Synchronization domain.

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#configure terminal
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#domain 30
```

dscp

Use this command to set DSCP value. Applicable for G.8275.2 profile, G 8265.1, SMPTE, and default profile.

Use the no form of this command to set default value 56.

Command Syntax

```
dscp <0-63>
no dscp
```

Parameters

<0-63>	DSCP value (default is 56)

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#dscp 2
```

g8265.1-option

Use this command to set G 8265.1 option1 or 2. Applicable for G.8265.1. Default is option1.

Use the no form of this command to set default value option1.

Command Syntax

```
g8265.1-option (1|2)
no g8265.1-option
```

Parameters

1	Set network option 1
2	Set network option 2

Command Mode

PTP Clock mode

Applicability

This command introduced in OcNOS version 4.2.

Example

```
(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#g8265.1-option 2
```

g8265.1-wtr

Use this command to set G 8265.1 wtr duration. Applicable for G.8265.1. Default is 0.

Use the no form of this command to set default value 0.

Command Syntax

```
g8265.1-wtr DURATION
no g8265.1-wtr
```

Parameters

DURATION	Duration value of g8265 WTR master in sec

Command Mode

PTP Clock mode

Applicability

This command introduced in OcNOS version 4.2.

Example

```
(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#g8265.1-wtr 60
```

gps-offset

Use this command to set GPS offset in nanoseconds and seconds.

Use the `no` form of this command to set default value 0 nanoseconds.

Command Syntax

```
gps-offset (sec <-100-100> | nsec <-2048-2048>)
no gps-offset
```

Parameters

`sec <-100-100>`

Offset value in seconds.

`nsec<-2048-2048>`

Offset value in nanoseconds.

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#gps-offset sec 100 nsec 2048
```

gps position

Use this command to enable survey-in, fixed, and disable mode.

Use the no form of this command to set to default.

Command Syntax

```
gps position (survey-in <1-1440> <1-10000> | fixed LATITUDE LONGITUDE ALTITUDE
  |disable)
no gps position
```

Parameters

`survey-in`	Mode as survey-in
`<1-1440>`	Minimum duration in minutes
`<1-10000>`	Position accuracy limit in centimeters
`fixed`	Mode as fixed
`LATITUDE`	GPS fixed latitude in decimal degree format
`LONGITUDE`	GPS fixed longitude in decimal degree format
`ALTITUDE`	GPS fixed altitude in meters
`disable`	Disable position

Command Mode

Configuration mode

Applicability

This command was introduced in OcNOS version 5.1.

Example

For `survey-in`:

```
(config)#gps position survey-in 30 1000
```

For `fixed`:

```
(config)#gps position fixed 12.975516 77.712692 919.1
```

For `disable`:

```
(config)#gps position disable
```

For the `no` command:

```
(config)#no gps position
```

gps satellite-system

Use this command to configure the global navigation satellite system (GNSS). GNSS satellites transmit the navigation and timing data to the GNSS receivers.

Use the `no` form of this command to unset the configured GNSS.

UBLOX NEO-M8T is a GNSS timing module that receives the signals from the GNSS. The platforms with UBLOX NEO-M8T support the below concurrent GNSS combinations:

Table 1-1: UBLOX neo-m8t supported GNSS combination

GPS	Galileo	GLONASS	BeiDou
Yes	Yes	No	No
Yes	Yes	Yes	No
Yes	Yes	No	Yes
Yes	No	Yes	No
Yes	No	No	Yes
No	Yes	Yes	No
No	Yes	No	Yes
No	No	Yes	Yes

Command Syntax

```
gps satellite-system {gps|galileo|glonass|beidou}
no gps satellite-system {gps|galileo|glonass|beidou}
```

Parameters

`gps`	Global Positioning System is a satellite based navigation system.
`galileo`	Galileo is a satellite based navigation system.
`glonass`	GLONASS is a satellite based navigation system.
`beidou`	BEIDOU is a satellite based navigation system.

Default

None

Command Mode

Configuration mode

Applicability

Introduced in OcNOS version 6.5.2 and is applicable for UfiSpace Qumran2 series platforms and Qumran-UX series platforms.

Example

The below example shows how to configure the GNSS:

```
OcNOS(config)#gps satellite-system gps galileo
OcNOS(config)#gps satellite-system glonass
OcNOS(config)#no gps satellite-system gps galileo
OcNOS(config)#no gps satellite-system glonass
```

grandmaster-priority2

Use this command to set grandmaster-priority2 for virtual-clock-port. Applicable for g.8275.1 profile. Not applicable to Ethernet interfaces.

Use the no form of this command to set priority2 default value 128.

Command Syntax

```
grandmaster-priority2 <0-255>
no grandmaster-priority2
```

Parameters

<0-255>	Priority range

Command Mode

PTP Clock Port Mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#grandmaster-priority2 2
```

holdover

Use this command to enable holdover.

Use the `no` form of this command to set default duration 120.

Command Syntax

```
holdover <0-10080>
no holdover
```

Parameters

`<0-10080>`	Range of holdover in minutes.

Command Mode

PTP Clock Mode

Default

Default holdover minutes is 120.

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#holdover 15
```

local-priority (ptp-clk mode)

Use this command to specify the local attribute of the local clock.

Use the no form of this command to set default value 128.

Note: Not supported for default profile.

Command Syntax

```
local-priority <1-255>
no local-priority
```

Parameters

<1-255>	A numerical value specifying the local priority

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#local-priority 100
```

local-priority (ptp-clk-port mode)

Use this command to specify the local attribute of the local clock.

Use the no form of this command to set default value 128.

Command Syntax

```
local-priority <1-255>
no local-priority
```

Parameters

<1-255>	Local priority

Command Mode

PTP Clock Port Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#clock-port 5
(config-clk-port)#local-priority 50
```

log-announce-interval

Use this command to set log-announce-interval. Applicable for only G.8275.2 profile, G 8265.1, SMPTE and default profile.

Use the no form of this command to set default value:

- -3 for G 8275.2 profile
- 1 for default profile
- 1 for G 8265.1 profile

Command Syntax

```
log-announce-interval <-3-4>
no log-announce-interval
```

Parameters

<-3-4>	log-announce-interval range: -3 to 3 for g8275.2 0 to 4 for default profile -3 to 4 for g8265.1

Command Mode

PTP Clock Port Mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#log-announce-interval -2

(config)#ptp clock 0 profile default
(config-ptp-clk)#clock-port 1
(config-clk-port)#log-announce-interval 2

(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#log-announce-interval 2
```

log-min-delay-req-interval

Use this command to set log-min-delay-req-interval. Applicable for only G.8275.2 profile, G 8265.1, SMPTE, and default profile.

Use the no form of this command to set default value:

- -6 for g8275.2 profile
- 0 for default profile
- 5 for G 8265.1 profile

Command Syntax

```
log-min-delay-req-interval <-7-5>
no log-min-delay-req-interval
```

Parameters

<-7-5>	log-min-delay-req-interval range: -7 to 0 or g8275.2 0 to 5 for default profile -7 to 4 for g8265.1

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#log-min-delay-req-interval -5

(config)#ptp clock 0 profile default
(config-ptp-clk)#clock-port 1
(config-clk-port)#log-min-delay-req-interval 5

(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#log-min-delay-req-interval 4
```

log-sync-interval

Use this command to set log-sync-interval. Applicable for only G.8275.2 profile, G 8265.1 profile, and default profile.

Use the no form of this command to set default value:

- -6 for g8275.2 profile
- 0 for default profile
- -5 for G 8265.1 profile

Command Syntax

```
log-sync-interval <-7-1>
no log-sync-interval
```

Parameters

<-7-1>	log-sync-interval range: -7 to 0 for g8275.2 -1 to 1 for default profile -7 to 4 for g8265.1

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#log-sync-interval -4

(config)#ptp clock 0 profile default
(config-ptp-clk)#clock-port 1
(config-clk-port)#log-sync-interval -1

(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#log-sync-interval -1
```

master

Use this command to configure master IPv4 and IPv6 address. Applicable for g.8275.2 profile, G 8265.1 profile, SMPTE, and default profile.

Use the `no` form of this command to delete master address.

Note: Priority is applicable for G 8265.1 profile only.

Command Syntax

```
master (ipv4 A.B.C.D|ipv6 X:X::X:X) (priority PRIORITY|)
no master (ipv4 A.B.C.D|ipv6 X:X::X:X)
```

Parameters

`A.B.C.D`	Master IPv4 address
`X:X::X:X`	Master IPv6 address
`PRIORITY`	Priority value of master (Default is 0)

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#transport ipv4
(config-clk-port)#master ipv4 10.1.1.2

(config)#ptp clock 0 profile default
(config-ptp-clk)#clock-port 1
(config-clk-port)#transport ipv4
(config-clk-port)#master ipv4 10.1.1.2

(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#transport ipv4
(config-clk-port)#master ipv4 10.1.1.2 priority 1

(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#transport ipv4
(config-clk-port)#master ipv4 10.1.1.2
```

master-only

Use this command to set a port to a master-only port.

Use the no form of this command to delete this configuration.

Command Syntax

```
master-only
no master-only
```

Parameters

None

Command Mode

PTP Clock Port Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#clock-port 10
(config-clk-port)#master-only
```

max-steps-removed

Use this command to specify the maximum number of communication paths between the local clock and the grandmaster clock.

Use the no form of this command to set default value 255.

Command Syntax

```
max-steps-removed <1-255>
no max-steps-removed
```

Parameters

<1-255>	Number of communication links between the local clock and the grandmaster clock.

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#max-steps-removed 10
```

network-interface

Use this command to reference the configured underlying interface that is used by this PTP Port.

Use the no form of this command to delete network-interface.

Command Syntax

```
network-interface IFNAME
network-interface IFNAME vlan VLAN_ID
network-interface IFNAME port IFNAME
network-interface(gps|prc)
no network-interface
```

Parameters

IFNAME	The name of a physical interface
VLAN_ID	VLAN ID <1-4094> applicable for g8275.1 profile
gps	GPS interface
prc	SMA/SMB or external interfaces

Command Mode

PTP Clock Port Mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#network-interface xe2
(config-clk-port)#exit
(config-ptp-clk)#clock-port 2
(config-clk-port)#network-interface xe3 vlan 2
(config-clk-port)#exit
(config-ptp-clk)#clock-port 3
(config-clk-port)#network-interface gps

(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#network-interface vlan1.2 port xe1

(config)#ptp clock 0 profile default
(config-ptp-clk)#clock-port 1
(config-clk-port)#network-interface vlan1.2 port xe1

(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#network-interface vlan1.2 port xe1
```

number-ports

Use this command to set the number of PTP ports on the instance. If the number of ports is larger than one, the clock is configured as a boundary clock, otherwise it's an ordinary clock.

Use the no form of this command to set default value 1.

Command Syntax

```
number-ports <1-128>
no number-ports
```

Parameters

<1-128>	Number of PTP ports on this instance.

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#number-ports 3
```

offset-log-variance

Use the command to specify an offset variance. The offset (scaled logarithmic variance) provides an estimate of the variations of the clock from a linear time scale when it is not synchronized to another clock using the PTP protocol.

Use the `no` form of this command in PTP Clock Mode to set the default value 65535.

Use the `no` form of this command in PTP Clock Port Mode to set the default value 0x4E5D for clock-port.

Note: Applicable for Non-Ethernet ports for PTP Clock Port mode.

Command Syntax

```
offset-log-variance <0-65535>
no offset-log-variance
```

Parameters

`<0-65535>`	The offset variance when not synchronized.

Command Mode

PTP Clock Mode

PTP Clock Port Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#offset-log-variance 3000

(config-ptp-clk)#clock-port 1
(config-clk-port)#offset-log-variance 2000
```

one-way

Use this command to set G 8265.1 one-way. Applicable for G.8265.1. Default is two-way.

Use the no form of this command to set default value.

Command Syntax

```
one-way
```

Parameters

None

Command Mode

PTP Clock mode

Applicability

This command was introduced in OcNOS version 4.2.

Example

```
(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#one-way
```

priority1

Use this command to set the Priority1 attribute of the local clock (as specified in the IEEE-1588 standard). This command applicable only for Default and SMPTE profiles.

Use the `no` form of this command to set default value 128.

Command Syntax

```
priority1 <0-255>
no priority1
```

Parameters

`<0-255>`	The Priority1 attribute of the local clock.

Default

None

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 6.4.2

Example

Following is an example to execute the CLI.

```
#configure terminal
(config)#ptp clock 0 profile smpte  (config-ptp-clk)#priority1 3
```

priority2

Use this command to set the Priority2 attribute of the local clock (as specified in the IEEE-1588 standard).

Use the no form of this command to set default value 128.

Command Syntax

```
priority2 <1-255>
no priority2
```

Parameters

<1-255>	The Priority2 attribute.

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#configure terminal
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#priority2 3
```

ptp clock profile

Use this command to enter PTP Clock Mode and to configure the G 8275.1, G 8275.2, default profile, and G 8265.1.

Use the `no` form of this command to delete PTP clock.

Note: For a single clock configuration, only clock 0 should be configured. Clock 1 is used only for the IWF use case.

Command Syntax

```
ptp clock <0-1> profile (g8275.1|g8275.2|default|g8265.1|smpte)
no ptp clock <0-1> profile
```

Parameters

`<0-1>`	Clock 0 or 1
`g8275.1`	PTP time/phase g8275.1 telecom profile
`g8275.2`	PTP time/phase g8275.2 telecom profile
`default`	PTP time/phase default profile
`g8265.1`	PTP frequency telecom profile
`smpte`	PTP SMPTE profile

Command Mode

Configure Mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)exit

(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)exit

(config)#ptp clock 0 profile default
(config-ptp-clk)exit

(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)exit

(config)#ptp clock 0 profile smpte
(config-ptp-clk)exit
```

ptp clock profile e2e-transparent

Use this command to configure PTP transparent clock profile.

Use the no form of this command to unconfigure PTP transparent clock profile.

Command Syntax

```
ptp clock 0 profile e2e-transparent
no ptp clock 0 profile
```

Parameters

None

Command Mode

Configure mode

Applicability

This command is introduced in OcNOS version 4.2.

Examples

```
(config)#ptp clock 0 profile e2e-transparent
(config)#no ptp clock 0 profile
```

ptp-clock-sync

Use this command to initialize the PTP clock from the operating system clock.

Use the no form of this command to disable ptp clock sync.

Command Syntax

```
ptp-clock-sync
no ptp-clock-sync
```

Parameters

None

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 6.0.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#ptp-clock-sync
(config)#
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#ptp-clock-sync
```

reserved-vlan-base-id

Use this command to set the Reserved VLAN base ID.

Use the no form of this command to set default base id 4064.

Command Syntax

```
reserved-vlan-base-id <2-4094>
no reserved-vlan-base-id
```

Parameters

<2-4094>	Base VLAN identifier range.

Command Mode

PTP Clock Mode

Default

Default VLAN base ID is 4064.

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#reserved-vlan-base-id 2
```

servo-history

Use this command to enable servo-history with specified interval.

Use the no form of this command to disable servo-history.

Command Syntax

```
servo-history <1-60>
no servo-history
```

Parameters

<1-60>	Enable servo-history in interval of <1-60> minutes (default is 15 minutes)

Command Mode

PTP Clock Mode

Default

Default interval value is 15 minutes.

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#servo-history 2
```

servo fts

Use this command to enable full time support with synce.

Use the `no` form of this command to disable servo FTS.

Note: This command is available for default and G.8275.2 profiles only.

Command Syntax

```
servo fts
```

```
no servo
```

Parameters

None

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 6.0.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#servo fts
```

```
(config)#ptp clock 0 profile default
(config-ptp-clk)#servo fts
```

show ptp clock

Use this command to display a summary of the Precision Time Protocol (PTP) clock status.

Note: The sm-tlv option applicable only for SMPTE profile.

Command Syntax

```
show ptp clock <0-1> ((dataset (default|current|parent|time-properties|)|)|
  (sm-tlv))
```

Parameters

`<0-1>`	Clock 0 or 1
`dataset`	The clock dataset
`default`	The default clock status
`current`	The current clock status
`parent`	The clock status of the parent-clock
`time-properties`	The clock dataset time-properties
`Sm-tlv`	SMPTE TLV information

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#show ptp clock 0
PTP Clock Profile             : g8275.1
Holdover Duration             : 120 min
Default Dataset:
  Two Step Flag               : No
  Clock Identity              : B8:6A:97:FF:FE:F5:F4:C4
  Number Of Ports             : 1
  Priority1                   : 128
  Priority2                   : 128
  Slave Only                  : No
  Local Priority              : 128
  Max Steps Removed           : 255
  Domain Number               : 24
  Clock Quality               :
    Clock Class               : 248
    Clock Accuracy            : 254
    Offset ScaledLogVariance  : 65535

Current Dataset:
  Steps Removed               : 0
  Offset From Master          : 0 (0.000 nsec)
  Mean Path Delay             : 0
```

```
Parent Dataset:
  Parent Port ID              :
    Clock Identity            : B8:6A:97:FF:FE:F5:F4:C4
    Port Number               : 0
  Parent Stats                : No
  Observed Parent O.S.L.V     : 65535 (Offset Scaled Log Variance)
  Observed Parent P.C.R.      : 2147483647 (Phase Change Rate)
  Grandmaster Identity        : B8:6A:97:FF:FE:F5:F4:C4
  Grandmaster Priority1       : 128
  Grandmaster Priority2       : 128
  Grandmaster Clock Quality   :
    Clock Class               : 248
    Clock Accuracy            : 38
    Offset ScaledLogVariance  : 65535

Time Dateset:
  Current UTC Offset Valid    : False
  Current UTC Offset          : 36
  Leap 59                     : False
  Leap 61                     : False
  Time Traceable              : False
  Frequency Traceable         : False
  PTP Timescale               : True
  Time Source                 : Internal Oscillator
  Time of Day                 : Thu Jan  1 19:52:59 1970

OcNOS#sh ptp clock 0 sm-tlv

SMPTE Sync Metadata:
  Default frame rate          : 30000/1001
  GM Lock Status              : 0
  Time Address Flags          : 0x00
  Current Local Offset        : -37
  Jump Seconds                : 0
  Time of Next Jump           : 0x000000000000
  Time of Next Jam            : 0x000000000000
  Time of Previous Jam        : 0x000000000000
  Previous Jam Local Offset   : 0
  Daylight Saving             :
    Current                   : Not in effect
    Next discontinuity        : Not in effect
    Previous daily jam event  : Not in effect
  Leap Second Jump            : 0x00
```

show ptp clock port brief

Use this command to display a summary of PTP ports.

Command Syntax

```
show ptp clock <0-1> port (<1-31>|) brief
```

Parameters

<0-1>	Clock 0 or 1
<1-31>	Port number

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#show ptp clock 0 port brief
Clock    Intf                Port                    Link
Port     Name                State          Encap    State     Mechanism
-------------------------------------------------------------------------
1        xe2                 Master         Eth      Up        1-step E2E
2        xe1                 Master         Eth      Up        1-step E2E
```

show ptp clock port dataset

Use this command to display a summary of PTP ports.

Command Syntax

```
show ptp clock <0-1> port (<1-31>|) dataset
```

Parameters

<0-1>	Clock 0 or 1
<1-31>	PTP port number

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#show ptp clock 0 port dataset
Port 1:
  Port State                  : Master
  Port Identity               : B8:6A:97:FF:FE:F5:F4:C4:00:01
  Log Min Delay Req Interval  : -4
  Peer Mean Path Delay        : 0
  Log Announce Interval       : -3
  Announce Receipt Timeout    : 3
  Log Sync Interval           : -4
  Delay Mechanism             : End to end
  Version Number              : 2
  Local Priority              : 128
  Master only                 : False
  Signal Fail                 : False
  Network Interface           : xe0
  Vlan Configured             :
  Description                 : 13
  TTL                         : 64
  DSCP                        : 56
  Unicast Grant Duration      : 300
  Configured delay asymmetry  : 101000000 nsec
  Received Packets            : 0
  Discarded Packets           : 0
  Transmitted Packets         : 99
```

show ptp clock port drop-counters

Use this command to display drop-counters of the clock-port.

Command Syntax

```
show ptp clock <0-1> port (<1-31>|) drop-counters
```

Parameters

<0-1>	Clock 0 or 1
<1-31>	PTP port number

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
#show ptp clock 0 port drop-counters
Port 1:
  Drop Counters
  Pkt rcvd on bad port state  : 4042
```

show ptp clock port peer

Use this command to display a peer summary of PTP ports.

Command Syntax

```
show ptp clock <0-1> port (<1-31>|) peer
```

Parameters

<0-1>	Clock 0 or 1
<1-31>	PTP port number

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#show ptp clock 0 port peer
Port 1 (1 peers):
  Peer #0
  IPv4 Address                : 10.1.1.2
  Clock Identity              : e8:c5:7a:ff:fe:2e:63:1c
  Received Announce           : 3297
  Received Sync               : 26523
  Received Delay Response     : 26524
  Received Signalling         : 9
  Transmitted Delay Request   : 26524
  Transmitted Signalling      : 9
```

show ptp clock port master

Use this command to display a master summary of PTP ports.

Command Syntax

```
show ptp clock <0-1> port (<1-31>|) master
```

Parameters

<0-1>	Clock 0 or 1
<1-31>	PTP port number

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 4.0

Example

```
#show ptp clock 0 port master
Port 1:
  Master #0                    : 10.1.1.2
```

show ptp clock port slave

Use this command to display a slave summary of PTP ports.

Command Syntax

```
show ptp clock <0-1> port (<1-31>|) slave
```

Parameters

<0-1>	Clock 0 or 1
<1-31>	PTP port number

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
#show ptp clock 0 port slave
Port 1:  Slave #0
     IPv4 Address                : 10.1.1.1
    Clock Identity              : e8:c5:7a:ff:fe:2e:4b:1c
    Delay Mechanism             : End to end
    log Announce Interval       : -3
    log Sync Interval           : -6
    Log Delay Req Interval      : -6
```

show ptp servo

Use this command to display servo information.

Command Syntax

```
show ptp servo
```

Parameters

None

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#show ptp servo
PTP servo status for clock 0
  Servo Config                : Phase Correction
  Servo State                 : Warmup
  Servo State Duration        : 04:26:07
  Servo APTS Mode             : N/A
  Lock Status                 : Unlocked
  Frequency Correction        : 0.000 ppb
  Phase Correction            : 0.000 nsec
  Offset From Master          : 0.000 nsec
  Mean Path Delay             : 0 nsec
  Sync Packet Rate            : 0
  Delay Packet Rate           : 0
```

show ptp servo history

Use this command to display servo history.

Command Syntax

```
show ptp servo history
```

Parameters

None

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
#show ptp servo history
Time                            Phase Correction        Freq Correction
                                (nsec)                  (pbb)
-------------------------------------------------------------------------
2000 Jan 06 19:15:01            0.000                   0.000
2000 Jan 06 19:17:01            0.000                   0.000
2000 Jan 06 19:19:01            0.000                   0.000
2000 Jan 06 19:21:01            0.000                   0.000
2000 Jan 06 19:23:01            0.000                   0.000
2000 Jan 06 19:25:01            0.000                   0.000
```

show ptp clock stats

Use this command to display PTP packet statistics.

Command Syntax

```
show ptp clock <0-1> stats
```

Parameters

<0-1>	Clock 0 or 1

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#show ptp clock 0 stats

clock 0:
  Number of ports             : 32
  Received Packets            : 0
  Discarded Packets           : 0
  Received IPv4 PTP Packets   : 0
  Received IPv6 PTP Packets   : 0
  Received L2 PTP Packets     : 0
  RX Queue Overflows          : 0
  Transmitted Packets         : 346

Port 1:
  Received Packets            : 0
  Discarded Packets           : 0
  Transmitted Packets         : 34
```

show ptp utc-offset

Use this command to display PTP leap seconds configuration.

Command Syntax

```
show ptp utc-offset
```

Parameters

None

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 6.4.1.

Example

```
#show ptp utc-offset
Utc offset baseline is 37

Leap seconds configured:
 From 2024-01-01 (3913056000 NTP seconds), utc offset is +38 seconds.
 From 2024-07-01 (3928780800 NTP seconds), utc offset is +39 seconds.
```

slave-only

Use this command to set a clock to a slave-only clock.

Use the no form of this command to unconfigure this option.

Command Syntax

```
slave-only
no slave-only
```

Parameters

None

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#configure terminal
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#slave-only
```

sm-tlv default-frame-rates

Use this command to set the default frame rate. Applicable only for SMPTE profile.For example, if the video default frame rate is 30000/1001 Hz, set first argument to numerator value (i.e 30000) and second argument to denominator value (i.e 1001).

Use the `no` form of this command to unconfigure default frame rates.

For the complete command reference, refer to sm-tlv default-frame-rates in *PTP SMPTE Profile Configuration* section.

sm-tlv time-address-flags color-frame

Use this command to set sm-tlv color frame. Applicable only for SMPTE profile.

Use the `no` form of this command to unconfigure sm-tlv color-frame.

For the complete command reference, refer to sm-tlv time-address-flags color-frame in *PTP SMPTE Profile Configuration* section.

sm-tlv time-address-flags drop-frame

Use this command to set sm-tlv drop frame. Applicable only for SMPTE profile.

Use the `no` form of this command to unconfigure sm-tlv drop-frame.

For the complete command reference, refer to sm-tlv time-address-flags drop-frame in *PTP SMPTE Profile Configuration* section.

source-address address

Use this command to set source-address as configured IP address for G.8275.2 profile, G 8265.1, SMPTE and Default profile.

Use the `no` form of this command to unconfigure this command. This command supports only if transport mode is multicast.

Command Syntax

```
source-address ipv4 address A.B.C.D
source-address ipv6 address X:X::X:X
no source-address (ipv4 | ipv6) address
```

Parameters

`ipv4`	Configuring Ipv4 address
`ipv6`	Configuring Ipv4 address
`A.B.C.D`	IPv4 address.
`X:X::X:X`	IPv6 address.

Default

None

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in the OcNOS version 6.4.2.

Example

Following is an example to execute the CLI.

```
OcNOS(config)#ptp clock 0 profile g8275.2
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)# source-address ipv4 address 10.1.1.1

OcNOS(config)#ptp clock 0 profile g8275.2
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)#source-address ipv6 address 10:1::1
```

source-address linklocal

Use this command to set source-address as link local for G.8275.2 profile, G 8265.1, SMPTE, and default profile.

Use the no form of this command to unconfigure this command.

Command Syntax

```
source-address ipv6 linklocal
no source-address ipv6 linklocal
```

Parameters

None.

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#source-address ipv6 linklocal

(config)#ptp clock 0 profile default
(config-ptp-clk)#clock-port 1
(config-clk-port)#source-address ipv6 linklocal
```

source-address interface

Use this command to set source-address as configured interface ip address for G.8275.2 profile, G 8265.1, SMPTE, and default profile.

Use the `no` form of this command to unconfigure this command.

Command Syntax

```
source-address (ipv4 | ipv6) interface IFNAME
no source-address (ipv4 | ipv6) interface
```

Parameters

`ipv4`	Configuring Ipv4 address
`ipv6`	Configuring Ipv4 address
`IFNAME`	Name of the interface whose IP address is used as the source address.

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in OcNOS version 6.4.1.

Example

```
OcNOS(config)#ptp clock 0 profile g8275.2
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)#source-address ipv4 interface lo

OcNOS(config)#ptp clock 0 profile g8275.2
OcNOS(config-ptp-clk)#clock-port 1
OcNOS(config-clk-port)#source-address ipv6 interface lo
```

sm-tlv append disable

Use this command to disable tlv append. Applicable only for SMPTE profile.

Use the `no` form of this command to unconfigure sm-tlv append disable.

For the complete command reference, refer to sm-tlv append disable section in *OcNOS Key Feature* document, Release 6.4.2.

sm-tlv process disable

Use this command to disable tlv processing. Applicable only for smpte profile.

Use the `no` form of this command to unconfigure sm-tlv process disable.

For the complete command reference, refer to sm-tlv process disable section in *OcNOS Key Feature* document, Release 6.4.2.

transport

Use this command to set transport type as IPv4 unicast/multicast or IPv6 Unicast/Multicast. Applicable for G.8275.2 profile, G 8265.1, SMPTE and default profile.

Use the `no` form of this command to unconfigure transport-type.

Command Syntax

```
transport (ipv4|ipv6|ipv4-multicast|ipv6-multicast)
no transport
no transport ipv6-multicast
```

Parameters

`ipv4`	IPv4 Transport Type
`ipv6`	IPv6 Transport Type
`ipv4-multicast`	IPv4 Multicast Transport Type
`ipv6-multicast`	IPv6 Multicast Transport Type

Default

None

Command Mode

PTP Clock Port mode

Applicability

`transport (ipv4|ipv6)` was introduced in the OcNOS version 4.0.

`transport (ipv4-multicast|ipv6-multicast)` was introduced in OcNOS version 6.4.2.

Example

Following is an example to execute the CLI.

```
OcNOS#configure terminal
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#transport ipv4-multicast

(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#no transport

(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#transport ipv6-multicast

(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#no transport
```

transport ipv6-multicast type

Use this command to set transport type as ipv6 multicast and we can specify the multicast address type. Applicable for G.8275.2 profile, G 8265.1, SMPTE profile and default profile.

Use the `no` form of this command to unconfigure transport-type.

For the complete command reference, refer to transport ipv6-multicast type section in *OcNOS Key Feature* document, Release 6.4.2.

ttl

Use this command to set ttl value. Applicable for G.8275.2 profile, G 8265.1, SMPTE and default profile.

Use the no form of this command to set default value 64.

Command Syntax

```
ttl VALUE
no ttl
```

Parameters

<1-255>	Setting ttl value (default is 64)

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#ttl 2

(config)#ptp clock 0 profile default
(config-ptp-clk)#clock-port 1
(config-clk-port)#ttl 2

(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#ttl 2
```

two-step

Use this command to set clock two-step flag.

Note: Applicable for QUX platforms.

Use the no form of this command to set default one-step.

Command Syntax

```
two-step
no two-step
```

Parameters

None

Default

Default is one-step.

Command Mode

PTP Clock mode

Applicability

This command introduced in OcNOS version 4.2.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#two-step
```

unicast-grant-duration

Use this command to set unicast-grant-duration value. Applicable for G.8275.2, G 8265.1, SMPTE and default profile. Default is 300.

Use the no form of this command to set default value 300.

Command Syntax

```
unicast-grant-duration <60-1000>
no unicast-grant-duration
```

Parameters

<60-1000>	Unicast-grant-duration value (default is 300)

Command Mode

PTP Clock Port mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#ptp clock 0 profile g8275.2
(config-ptp-clk)#clock-port 1
(config-clk-port)#unicast-grant-duration 70

(config)#ptp clock 0 profile default
(config-ptp-clk)#clock-port 1
(config-clk-port)#unicast-grant-duration 70

(config)#ptp clock 0 profile g8265.1
(config-ptp-clk)#clock-port 1
(config-clk-port)#unicast-grant-duration 70
```

utc-offset baseline

Use this command to set the UTC leap seconds baseline which is the default value of leap seconds at the time before any configured utc-offset date, to calculate UTC time from TAI timescale: UTC = TAI - offset.

Use the no form of this command to set default value 37 seconds, which is applied on 2017-01-01.

Command Syntax

```
utc-offset baseline <0-99>
```

Parameters

<0-99>	UTC leap seconds baseline

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 6.3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#utc-offset baseline 38
(config-ptp-clk)#utc-offset date 2024-07-01 39
(config-ptp-clk)#clock-type tgm
(config-ptp-clk)#number-ports 1
(config-ptp-clk)#clock-port 1
(config-clk-port)#network-interface xe5
(config-clk-port)#master-only
(config-clk-port)#exit
(config-ptp-clk)#commit
(config-ptp-clk)#exit
```

utc-offset date

Use this command to set the UTC date when applying new offset value of leap seconds. Multiple dates with offset entries can be added.

Command Syntax

```
utc-offset date YYYY-MM-DD <0-99>
no utc-offset date YYYY-MM-DD
```

Parameters

YYYY-MM-DD	Date
<0-99>	Offset in seconds

Command Mode

PTP Clock Mode

Applicability

This command was introduced in OcNOS version 6.3.0.

Example

```
(config)#ptp clock 0 profile g8275.1
(config-ptp-clk)#utc-offset baseline 38
(config-ptp-clk)#utc-offset date 2024-07-01 39
(config-ptp-clk)#clock-type tgm
(config-ptp-clk)#number-ports 1
(config-ptp-clk)#clock-port 1
(config-clk-port)#network-interface xe5
(config-clk-port)#master-only
(config-clk-port)#exit
(config-ptp-clk)#commit
(config-ptp-clk)#exit
```

Synchronous Ethernet Configuration

CHAPTER 1 Configuring Synchronous Ethernet

This chapter shows how to configure Synchronous Ethernet. This chapter shows two scenarios in selecting a frequency source:

- Using quality level
- Using priority

Topology

In the topology shown in Figure 1-10, SW2 can select a clock source from SW1 or SW3. The selection is based on quality level or priority.

Note: We can enable SyncE on the physical interfaces which can be L2, L# or member port of the LAG.

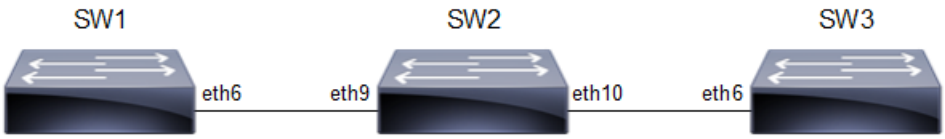


Figure 1-10: Selecting a Frequency Source

Using Quality Level

In the procedure below, SW1 and SW3 are both configured as output sources, with SW1 having quality level QL_PRC and SW3 having quality level QL_SSU_A. SW2 is configured to accept a frequency from either SW1 or SW3. Because quality level is used as the clock selection criteria (the default setting), SW2 chooses SW1 as the frequency source.

SW1

`#configure terminal`	Enter configure mode.
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#synchronization option 1`	Set the synchronization network type.
`(config-synce)#exit`	Exit configure Synchronous Ethernet mode.
`(config)#interface eth6`	Configure interface eth6.
`(config-if)#switchport`	Configure eth6 as a layer 2 port.
`(config-if)# bridge group 1`	Configure the interface to be part of bridge 1.
`(config-if)#synce`	Enter interface Synchronous Ethernet mode.
`(config-if-synce)#mode synchronous`	Configure synchronous mode.
`(config-if-synce)#output-source`	Configure the interface as an output source.
`(config-if-synce)#quality-level QL_PRC`	Assign the quality level as PRC.
`(config-if-synce)#exit`	Exit interface Synchronous Ethernet mode.
`(config-if)#exit`	Exit interface mode.

SW2

(config)#interface eth9	Configure interface eth9.
(config-if)#switchport	Configure eth9 as a layer 2 port.
(config-if)# bridge group 1	Configure the interface to be part of bridge 1.
(config-if)#synce	Enter interface Synchronous Ethernet mode.
(config-if-synce)#mode synchronous	Configure synchronous mode.
(config-if-synce)#input-source 2	Configure the interface as an input source with priority 2.
(config-if-synce)#exit	Exit interface Synchronous Ethernet mode.
(config-if)#exit	Exit interface mode.
(config)#interface eth10	Configure interface eth10.
(config-if)#switchport	Configure eth10 as a layer 2 port.
(config-if)# bridge group 1	Configure the interface to be part of bridge 1.
(config-if)#synce	Enter interface Synchronous Ethernet mode.
(config-if-synce)#mode synchronous	Configure synchronous mode.
(config-if-synce)#input-source 2	Configure the interface as an input source with priority 2.
(config-if-synce)#exit	Exit interface Synchronous Ethernet mode.
(config-if)#exit	Exit interface mode.

SW3

(config)#interface eth6	Configure interface eth6.
(config-if)#switchport	Configure eth1 as a layer 2 port.
(config-if)# bridge group 1	Configure the interface to be part of bridge 1.
(config-if)#synce	Enter interface Synchronous Ethernet mode.
(config-if-synce)#mode synchronous	Configure synchronous mode.
(config-if-synce)#output-source	Configure the interface as an output source.
(config-if-synce)#quality-level QL_SSU_A	Assign the quality level as SSU_A.
(config-if-synce)#exit	Exit interface Synchronous Ethernet mode.
(config-if)#exit	Exit interface mode.

Validation

SW1

1. Verify the Synchronous Ethernet details.

```
#Verify the output source.
#show synce output-sources
Interface Name  : eth6
Link State      : Up
QL Configured   : QL_PRC
QL Operational  : QL_PRC
```

SW2

1. Verify the input source.

```
#show synce input-sources
Interface Name          : eth9
ESMC Status             : OK
Is-selected-Source      : Yes
QL Configured           : N/A
QL received in ESMC     : QL_PRC
QL Operational          : QL_PRC
Priority                : 2
Hold-off(ms)            : 300
Wait-to-restore(mins)   : 5
Link State              : Up
Signal Fail             : No
External Commands       : None
Clock-source-ID         : 256
WTR Timer Running       : No
Hold-off Timer Running  : No


Interface Name          : eth10
ESMC Status             : OK
Is-selected-Source      : No
QL Configured           : N/A
QL received in ESMC     : Ql_SSU_A
QL Operational          : Ql_SSU_A
Priority                : 2
Hold-off(ms)            : 300
Wait-to-restore(mins)   : 5
Link State              : Up
Signal Fail             : No
External Commands       : None
Clock-source-ID         : 256
WTR Timer Running       : No
Hold-off Timer Running  : No
```

2. Verify the Synchronous Ethernet details.

```
#
# show synce de
Equipment Clock         : EEC-option1
Interface Name          : eth9
ESMC Status             : OK
Is-selected-Source      : YES
QL                      : QL_PRC
SyncE Clock State       : Locked
DPLL Clock State        : Locked
Synce State Duration    : 00:02:25
Selected-Clk-Src-ID     : 256
```

SW3

1. Verify the Synchronous Ethernet details.

```
#
#show synce de
```

```
Equipment Clock          : EEC-option1
SyncE Clock State        : Free-run
DPLL Clock State         : Free-run
```

2. Verify the output source on SW3.

```
#
Interface Name   : eth6
Link State       : Up
QL Configured    : QL_SSU_A
QL Operational   : QL_SSU_A
```

Note: Use "`show synce stats`" to check the counter statistics and use "`clear synce stats`" to clear the counters. Show esmc counters changed to show synce stats.

Using Priority

In the procedure below, SW1 and SW3 in Figure 1-10 are both configured as output sources, with SW1 having priority 2 and SW3 having priority 1. SW2 is configured to accept a frequency from either SW1 or SW3. Because quality level is not used as the clock selection criteria (an explicit setting), SW2 chooses SW3 (with the higher priority) as the frequency source.

SW1

`#configure terminal`	Enter configure mode.
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#synchronization option 1`	Set the synchronization network type.
`(config-synce)#clock-selection mode ql-disabled`	Disable quality level checking.
`(config-synce)#exit`	Exit configure Synchronous Ethernet mode.
`(config)#interface eth6`	Configure interface eth6.
`(config-if)#switchport`	Configure eth6 as a layer 2 port.
`(config-if)#bridge group 1`	Configure the interface to be part of bridge 1
`(config-if)#synce`	Enter interface Synchronous Ethernet mode.
`(config-if-synce)#mode synchronous`	Configure synchronous mode.
`(config-if-synce)#output-source`	Configure the interface as an output source.
`(config-if-synce)#quality-level QL_PRC`	Assign quality level as PRC.
`(config-if-synce)#exit`	Exit interface Synchronous Ethernet mode.
`(config-if)#exit`	Exit interface mode.

SW2

`#configure terminal`	Enter configure mode.
`(config)#synce`	Enter configure Synchronous Ethernet mode.
`(config-synce)#clock-selection mode ql-disabled`	Disable quality level checking.
`(config-synce)#exit`	Exit configure Synchronous Ethernet mode

(config)#interface eth9	Configure interface eth9.
(config-if)#switchport	Configure eth9 as a layer 2 port.
(config-if)#bridge group 1	Configure the interface to be part of bridge 1
(config-if)#synce	Enter interface Synchronous Ethernet mode.
(config-if-synce)#mode synchronous	Configure synchronous mode.
(config-if-synce)#input-source 2	Configure the interface as an input source with priority 2.
(config-if-synce)#exit	Exit interface Synchronous Ethernet mode.
(config-if)#exit	Exit interface mode.
(config)#interface eth10	Configure interface eth10.
(config-if)#switchport	Configure eth10 as a layer 2 port
(config-if)#bridge group 1	Configure the interface to be part of bridge 1
(config-if)#synce	Enter interface Synchronous Ethernet mode.
(config-if-synce)#mode synchronous	Configure synchronous mode.
(config-if-synce)#input-source 1	Configure the interface as an input source with priority 1.
(config-if-synce)#exit	Exit interface Synchronous Ethernet mode.
(config-if)#exit	Exit interface mode.

SW3

#configure terminal	Enter configure mode.
(config)#synce	Enter configure Synchronous Ethernet mode.
(config-synce)#synchronization option 1	Configure synchronization network as option 1.
(config-synce)#clock-selection mode ql-disabled	Disable quality level checking.
(config-synce)#exit	Exit configure Synchronous Ethernet mode.
(config)#interface eth6	Configure interface eth6.
(config-if)#switchport	Configure eth6 as a layer 2 port.
(config-if)#bridge group 1	Configure the interface to be part of bridge 1
(config-if)#synce	Enter interface Synchronous Ethernet mode.
(config-if-synce)#mode synchronous	Configure synchronous mode.
(config-if-synce)#output-source	Configure the interface as an output source.
(config-if-synce)#quality-level QL_SSU_A	Assign quality level as SSU_A.
(config-if-synce)#exit	Exit interface Synchronous Ethernet mode.
(config-if)#exit	Exit interface mode.

Validation

SW1

1. Verify the Synchronous Ethernet details.

```
#show synce de
Equipment Clock          : EEC-option1
SyncE Clock State        : Free-run
```

```
DPLL Clock State        : Free-run
Synce State Duration    : 00:39:20
```

2. Verify the output source.

```
#show synce output-sources
Interface Name  : eth6
Link State      : Up
QL Configured   : QL_PRC
QL Operational  : QL_PRC
```

SW2

1. Verify the input source

```
#show synce input-sources
Interface Name          : eth9
ESMC Status             : OK
Is-selected-Source      : No
QL Configured           : N/A
QL received in ESMC     : QL_PRC
QL Operational          : QL_PRC
Priority                : 2
Hold-off(ms)            : 300
Wait-to-restore(mins)   : 5
Link State              : Up
Signal Fail             : No
External Commands       : None
Clock-source-ID         : 256
WTR Timer Running       : No
Hold-off Timer Running  : No


Interface Name          : eth10
ESMC Status             : OK
Is-selected-Source      : Yes
QL Configured           : N/A
QL received in ESMC     : Ql_SSU_A
QL Operational          : Ql_SSU_A
Priority                : 2
Hold-off(ms)            : 300
Wait-to-restore(mins)   : 5
Link State              : Up
Signal Fail             : No
External Commands       : None
Clock-source-ID         : 256
WTR Timer Running       : No
Hold-off Timer Running  : No
```

2. Verify the Synchronous Ethernet details.

```
# show synce de
Equipment Clock         : EEC-option1
Interface Name          : eth10
ESMC Status             : OK
Is-selected-Source      : YES
QL                      : QL_SSU_A
SyncE Clock State       : Locked
```

```
DPLL Clock State        : Locked
Synce State Duration    : 00:02:25
Selected-Clk-Src-ID     : 256
```

SW3

1. Verify the Synchronous Ethernet details.

```
#show synce de
Equipment Clock         : EEC-option1
SyncE Clock State       : Free-run
DPLL Clock State        : Free-run
Synce State Duration    : 00:39:20
```

2. Verify the output source.

```
#show synce output-sources
Interface Name  : eth6
Link State      : Up
QL Configured   : QL_SSU_A
QL Operational  : QL_SSU_A
```

Synchronous Ethernet Command Reference

CHAPTER 1 SyncE Commands

This chapter describes the Synchronous Ethernet configuration commands:

1000Base-T mode

Use this command to set the 1000Base-T mode as master or slave. Applicable for broncos phy ports.

Use `no` form of this command to unset this configuration and set default value as auto

Command Syntax

```
1000Base-T (master|slave)
no 1000Base-T
```

Parameters

`Master`	Configure 1000Base-T mode to master
`slave`	Configure 1000Base-T mode to slave

Default

The default value is auto.

Command Mode

Interface Synchronous Ethernet mode

Applicability

This command was introduced in OcNOS version 4.1.

Example

```
(config)#interface ge1
(config-if)#
(config-if)#synce
(config-if-synce)#1000Base-T master
```

clock-selection mode

Use this command to set whether to use the Quality Level (QL) as a criteria when selecting a clock.

Use the `no` form of this command to set the QL to its default (`ql-enabled`).

Command Syntax

```
clock-selection mode (ql-enabled|ql-disabled)
no clock-selection
```

Parameters

`ql-enabled`	Use the quality level as a criteria when selecting a clock
`ql-disabled`	Do not use the quality level as a criteria when selecting a clock

Default

The default value is `ql-enabled`.

Command Mode

Synchronous Ethernet mode

Applicability

This command was introduced before OcNOS version 1.3.

Example

```
(config)#synce
(config-synce)#clock-selection mode ql-enabled

(config-synce)#no clock-selection
```

clock-source-id

Use this command to set the clock source ID for Synchronous Ethernet interface.

Use the `no` form of this command to unset this value.

Note: Assign the same clock source ID if interfaces are connected to same clock source.

Command Syntax

```
clock-source-id <1-255>
no clock-source-id
```

Parameters

`<1-255>`	Clock Source ID.

Command Mode

Interface Synchronous Ethernet Mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#configure terminal
(config)#interface xe1
(config-if)#synce
(config-if-synce)#clock-source-id 1
```

debug synce

Use this command to turn on debugging.

Use the `no` form of this command to turn off debugging

Command Syntax

```
debug synce (event|recvd|trans|all)
no debug synce (event|recvd|trans|all)
```

Parameters

`event`	Enable event debugs
`recvd`	Enable receive debugs
`trans`	Enable transmit debugs
`all`	Enable all debugs

Command Mode

Exec mode and Privileged Exec mode

Configure mode

Applicability

This command was introduced before OcNOS version 1.3.

Example

```
(config)#debug synce event
(config)#debug synce recvd
(config)#debug synce trans
(config)#no debug synce event
(config)#no debug synce recvd
(config)#no debug synce trans
```

dpll3-select

Use this command to select dpll3 as fixed input 10MHZ-IN.

Use `no` form of this command to unset this configuration.

Command syntax

```
dpll3-select 10mhz-in
no dpll3-select
```

Command Mode

Configure Synchronous Ethernet mode

Applicability

This command was introduced before OcNOS version 4.0. Applicable only for UFI-S9500-30XS board.

Examples

```
(config)#synce
(config-synce)#dpll3-select 10mhz-in
```

hold-off

Use this command to set the hold-off time in milliseconds. The hold-off time ensures that short activation of signal fail is not passed to the selection process.

Use the `no` form of this command to set the default value (300 milliseconds).

Command syntax

```
hold-off <300-1800>
no hold-off
```

Parameters

`<300-1800>`	Hold-off time in milliseconds

Default

The default value is 300 milliseconds.

Command Mode

Interface Synchronous Ethernet mode

Applicability

This command was introduced before OcNOS version 1.3.

Examples

```
(config)#interface eth1
(config-if)#synce
(config-if-synce)#hold-off 500

(config-if-synce)#no hold-off
```

holdover

Use this command to set Synchronous holdover.

Use `no` form of this command to disable holdover.

Command Syntax

```
holdover (<0-1440>|)
no holdover
```

Parameters

`<0-1440>`	Synchronous holdover range in minutes.

Command Mode

Synchronous Ethernet Mode

Default

Default Synchronous holdover is 10 minutes.

Applicability

This command was introduced in OcNOS version 4.0. Applicable only for 10MHz out interface.

Example

```
#configure terminal
(config)#synce
(config-synce)#holdover 2
```

input-source

Use this command to set an input timing source. Synchronization packets are received from this source and sent to the clock selection algorithm.

Use the `no` form of this command to delete an input source.

Command Syntax

```
input-source <0-255>
no input-source
```

Parameters

`<0-255>`	Priority: 1 is the highest, 255 is the lowest; 0 means the source will not be considered by the clock selection algorithm

Default

The default value is 0 meaning the interface will not be considered by the clock selection algorithm.

Command Mode

Interface Synchronous Ethernet mode

Applicability

This command was introduced before OcNOS version 1.3.

Example

```
(config)#interface eth1
(config-if)#synce
(config-if-synce)#input-source 1
```

mode

Use this command to configure the interface as synchronous or non-synchronous:

- Synchronous interfaces extract the frequency of their input signal from synchronization packets and passes them to their internal clocks.
- Non-synchronous interfaces do not participate in the synchronization process.

Use the `no` form of this command to set the mode to its default (`non-synchronous`).

Command Syntax

```
mode (synchronous | non-synchronous)
no mode
```

Parameters

`synchronous` Synchronous mode

`non-synchronous`
Non-synchronous mode

Default

The default value is `non-synchronous`.

Command Mode

Interface Synchronous Ethernet mode

Applicability

This command was introduced before OcNOS version 1.3.

Example

```
(config)#interface eth1
(config-if)#synce
(config-if-synce)#mode synchronous

(config-if-synce)#no mode
```

output-source

Use this command to use an Ethernet interface as a timing output source.

Use the `no` form of this command to stop using an Ethernet interface as a timing output source.

Command Syntax

```
output-source
no output-source
```

Parameters

None

Command Mode

Interface Synchronous Ethernet mode

Applicability

This command was introduced before OcNOS version 1.3.

Example

```
(config)#interface eth1
(config-if)#synce
(config-if-synce)#output-source
```

quality-level

Use this command to set the quality level (QL) for the timing source.

Use the `no` form of this command unconfigure quality-level on a port.

Command Syntax

```
quality-level QL_VAL
no quality-level
```

Parameters

`QL_VAL`	Quality level. The quality level you can specify depends on setting of the synce-interface command. See ITU-T Rec. G.781 for details.
`QL_PRC`	Primary Reference Clock
`QL_SSU_A`	Types I or V slave clock
`QL_SSU_B`	Type VI slave clock
`QL_SEC`	SDH Equipment Clock
`QL_DNU`	Do not use this signal for synchronization
`QL_STU`	Synchronized – traceability unknown
`QL_ST2`	Traceable to stratum 2
`QL_ST3E`	Traceable to stratum 3E
`QL_SMC`	Traceable to SONET clock self timed
`QL_PROV`	Provisionable by the network operator

Command Mode

Interface Synchronous Ethernet mode

Applicability

This command was introduced before OcNOS version 1.3.

Examples

```
(config)#interface eth1
(config-if)#synce
(config-if-synce)#quality-level QL_PRC
```

synce (configure mode)

Use this command to configure Synchronous Ethernet.

This command changes the mode from configure mode to configure Synchronous Ethernet mode and initializes the global Synchronous Ethernet parameters.

Use `no` form of this command to disable synce.

Command Syntax

```
synce
no synce
```

Parameters

None

Command Mode

Configure mode

Applicability

This command was introduced before OcNOS version 1.3.

Example

```
(config)#synce
(config-synce)
```

synce (interface mode)

Use this command to enable Synchronous Ethernet for an interface.

This command changes the mode from interface mode to interface Synchronous Ethernet mode.

This command does not automatically start synchronization distribution. You must explicitly give the mode command, specifying the `synchronous` option.

Use the `no` form of this command disable Synchronous Ethernet for an interface.

Command Syntax

```
synce
no synce
```

Parameters

None

Command Mode

Interface mode

Applicability

This command was introduced before OcNOS version 1.3.

Example

```
(config)#interface eth1
(config-if)#synce
(config-if-synce)#
```

synce-interface

Use this command to enable Synchronous Ethernet for both GPS and 10MHz interfaces as input interfaces. This command changes the mode from interface mode to Synchronous interface Ethernet mode.

Use no form of this command to delete synce interface.

Note: Bits-e1 Applicable only for UFI-S9500-30XS, UFI-S9500-22XST, AS7316-26XB boards.

Note: Bits-t1 Applicable only for UFI-S9500-30XS, UFI-S9500-22XST boards.

Command Syntax

```
synce-interface (gps | 10mhz-in|ptp|bits-t1|bits-e1)
no synce-interface (gps | 10mhz-in|ptp |bits-t1|bits-e1)
```

Parameters

`gps`	Input interface as GPS
`10mhz-in`	Input interface as 10MHz
`ptp`	PTP interface as input-source
`bits-t1`	bits-t1 interface as input-source
`bits-e1`	bits-e1 interface as input-source

Command Mode

Interface mode

Applicability

This command was introduced in OcNOS version 4.0.

Example

```
(config)#interface eth1
(config-if)#synce-interface gps
(config-synce-if)#

 (config)#synce-interface bits-t1
(config-synce-if)#
```

synchronization option

Use this command to set the synchronization option for the internal clock that is locked in frequency to an incoming signal.

Use the `no` form of this command to set the default synchronization option (1).

Command Syntax

```
synchronization option (1 | 2)
no synchronization option
```

Parameters

1	Networks optimized for the 2048 kbit/s hierarchy
2	Networks optimized for the 1544 kbit/s hierarchy that includes the rates 1544 kbit/s, 6312 kbit/s, and 44 736 kbit/s

Default

The default value is 1.

Command Mode

Configure Synchronous Ethernet mode

Applicability

This command was introduced before OcNOS version 1.3.

Example

```
(config)#synce
(config-synce)#synchronization option 2

(config-synce)#no synchronization option
```

wait-to-restore

Use this command to set the wait-to-restore timer in minutes. The wait-to-restore time ensures that a synchronization source that previously failed is considered by the selection process again only if it is fault free for a certain time.

Use the `no` form of this command to set the default wait-to-restore time (5 minutes).

Command syntax

```
wait-to-restore <0-12>
no wait-to-restore
```

Parameters

`<0-12>`	Wait-to-restore time in minutes

Default

The default value is 5 minutes.

Command Mode

Interface Synchronous Ethernet mode

Applicability

This command was introduced before OcNOS version 1.3.

Examples

```
(config)#interface eth1
(config-if)#synce
(config-if-synce)#wait-to-restore 1

(config-if-synce)#no wait-to-restore
```

CHAPTER 2 SyncE Show Commands

This chapter describes the Synchronous Ethernet show commands:

show debugging synce

Use this command to display debugging of Ethernet Synchronization.

Command Syntax

```
show debugging synce
```

Parameters

NoneOcNOS version 6.2.0

Command Mode

Exec mode and Privileged Exec mode

Applicability

This command was introduced in OcNOS version 6.3.0.

Example

```
#debug synce all
#show debugging synce
SyncE debugging status:
SyncE events debugging is on
SyncE receive debugging is on
SyncE transmit debugging is on
```

show synce stats

Use this command to display Ethernet Synchronization statistics.

Note: Show esmc counters changed to show synce stats.

Command Syntax

```
show synce stats
```

Parameters

None

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#show synce stats
Interface Name    Status      ESMC Received  ESMC Sent
_____________________________________________________
xe47                OK          1_________________1
xe48                OK          5_________________2
```

show synce details

Use this command to display details of the clock most recently selected by the Clock Selection Algorithm (CSA).

Command Syntax

```
show synce details
```

Parameters

None

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#show synce details
Equipment Clock          : EEC-option1
Interface Name           : eth9
ESMC Status              : OK
Is-selected-Source       : YES
QL                       : QL_PRC
SyncE Clock State        : Locked
DPLL Clock State         : Locked
Synce State Duration     : 00:03:26
Selected-Clk-Src-ID      : 256
```

show synce input-sources

Use this command to display details of all interfaces that are configured as Synchronous Ethernet input sources.

Command Syntax

```
show synce input-sources
```

Parameters

None

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#show synce input-sources
Interface Name          : xe1
ESMC Status             : OK
Is-selected-Source      : YES
QL Configured           : QL_PRC
QL received in ESMC     : QL_PRC
Operational QL          : QL_PRC
Priority                : 1
Hold-off(ms)            : 300
Wait-to-restore(mins)   : 5
Signal Fail             : No
External Commands       : None
Clock-source-ID         : 256
WTR Timer Running       : No
Hold-off Timer Running  : No
```

show synce output-sources

Use this command to display details of all interfaces that are configured as Synchronous Ethernet output sources.

Command Syntax

```
show synce output-sources
```

Parameters

None

Command Mode

Privileged Exec mode

Applicability

This command was introduced in OcNOS version 3.0.

Example

```
#show synce output-sources
Interface Name  : eth6
Link State      : Up
QL Configured   : QL_PRC
QL Operational  : QL_DNU
```

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