OcNOS®

Open Compute Network Operating System for Data Centers Version 6.6.0

Key Features

February 2025

Contents

Preface

This guide describes how to configure OcNOS.

Audience

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

Conventions

Table P-1 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

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.

Comments

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

Improved Management

This section describes the network monitoring enhancements and new features introduced in the Release 6.6.0

- [Streaming Telemetry Over Transport Layer Security](#)
- [gNMI Get RPC Mode](#)
- [Wildcard Support in Sensor Paths](#)
- [Traffic Mirroring using ERSPAN](#)

Traffic Mirroring using ERSPAN

Overview

Encapsulated Remote Switched Port Analyzer (ERSPAN) is a function used for monitoring network traffic. Using ERSPAN, you can mirror traffic from one or more ports or VLANs on a network switch and send the mirrored traffic to a remote monitoring device for analysis.

ERSPAN encapsulates mirrored traffic with Generic Routing Encapsulation (GRE) and, in addition, ERSPAN headers to send over an IP network.

Traffic mirroring protocols such as Switched Port Analyzer (SPAN) and Remote Switched Port Analyzer (RSPAN) in OcNOS allow traffic analysis within the same domain. ERSPAN aims to overcome this limitation by routing the traffic to any destination on the network.

Feature Characteristics

The main characteristics of ERSPAN are as follows:

- Transports mirrored traffic from the source to the destination over Layer 3 IP network.
- Monitors ingress, egress, or both ingress and egress traffic.
- Sends mirrored traffic to remote monitoring device for analysis without being restricted by Layer 2 boundaries.
- Supports filters on ingress traffic providing capability to filter the traffic to be mirrored.
- Supports Type 1 and Type 3 ERSPAN, with Type 1 as the default.

Supported Hardware

- XGS platforms - TD3, TH/TH2

Limitations

The following encapsulations are not supported:

- Type 1 IPv6
- Type 3 IPv4 - egress traffic mirroring
- Type 3 IPv6

Prerequisites

Before configuration, ensure the IP address is available for:

- Destination of the ERSPAN tunnel.
- Origin of the ERSPAN tunnel.

Configuration

The following configuration enables a sender session to send packets to the destination over ERSPAN tunnels.
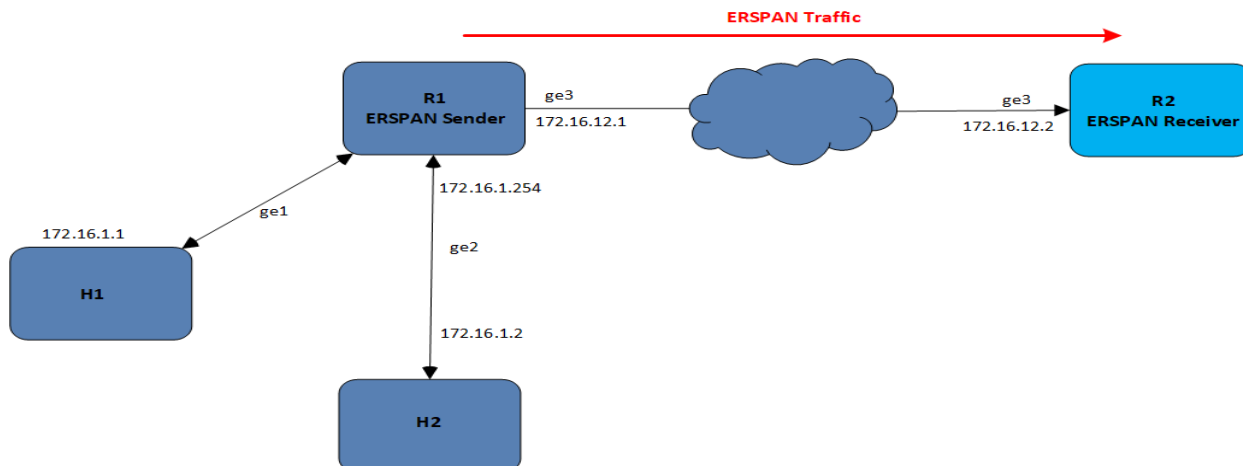
Topology

The topology shown here consists of Hosts **H1** and **H2**, a Sender node **R1** and a Receiver node **R2.**

The sender node forwards ERSPAN traffic to the receiver node. An ERSPAN tunnel is created between R1 and R2 over interface **ge3**.

R1 collects the traffic received or sent over one or more interfaces (such as **ge1** and/or **ge2)**, mirrors the collected traffic, encapsulates the packets inside ERSPAN and sends them to the IP address on R2.

R2 is configured to receive ERSPAN encapsulated packets.

Figure P-1: ERSPAN Topology

The configuration is done in two stages:

1. Configure ERSPAN destination

2. Configure ERSPAN sender session using the ERSPAN destination

Configure ERSPAN destination

1. Enter configure mode and set a name for the ERSPAN destination.
   ```
   R1(config-router)#monitor destination erspan erspan_dest_1
   R1(config-erspan-dst)#
   ```

2. Configure the destination IPv4/IPv6 where the ERSPAN packets will be forwarded.
   ```
   R1(config-erspan-dst)#dest-ip 172.16.12.2
   ```

3. Set the origin IPv4/IPv6 of the ERSPAN tunnel.
   ```
   R1(config-erspan-dst)#origin-ip 172.16.12.1
   ```

4. The below parameters are optional. If not specified, the default values are used for each parameter.

   • Set the VRF where the ERSPAN tunnel will be created. If not specified, value `default` will be used.
     ```
     R1(config-erspan-dst)#vrf default
     ```

- Set the TTL value to be used at the outer IP layer. If not specified, value 255 will be used.
  ```
  R1(config-erspan-dst)#ttl 50
  ```
- Set the DSCP value to be used at the outer IP layer. If not specified, value 0 will be used.
  ```
  R1(config-erspan-dst)#dscp 211
  ```
- Enable the packet truncation when mirroring to the ERSPAN destination. When this flag is set, the original packet is truncated to 192 bytes and then encapsulated in ERSPAN. By default, truncation is not enabled.
  ```
  R1(config-erspan-dst)#enable-truncate
  ```
  Note: Packet truncation is not supported on TH and TH2 platforms.

- Set the ERSPAN tunnel to Type 1 or Type 3. If not specified, value 1 will be used.
  ```
  R1(config-erspan-dst)#erspan-type 1
  ```
- Set the ERSPAN ID to be used in the ERSPAN session. This is relevant for type 3 only. If not specified, value 0 is used.
  ```
  R1(config-erspan-dst)#erspan-id 100
  ```
- Set a Hardware ID value between 0 to 63. This parameter is relevant for type 3 only. If not specified, value 0 is used.
  ```
  R1(config-erspan-dst)#hardware-id 45
  ```
- Set a Switch ID value between 0 to 511. This parameter is relevant for type 3 only. If not specified, value 0 is used.
  ```
  R1(config-erspan-dst)#switch-id 110
  ```
- Commit the changes.
  ```
  R1(config-erspan-dst)#commit
  ```

Configure ERSPAN sender session

1. Enter configure mode and create a sender session with ID 1. Optionally, you can enter a description for the session (containing a maximum of 32 characters).
   ```
   R1(config)#monitor session 1 type erspan-sender
   R1(config-monitor)#description R1 ERSPAN sender
   ```

2. Configure the ERSPAN destination for the session using the name of the destination that has been created previously.
   ```
   R1(config-monitor)#destination erspan erspan_dest_1
   ```

3. Optionally, add sources such as `source VLAN` and/or `source interface` to the sessions. For example, the command `source interface` configures the monitored source interface and the direction of the traffic to be monitored. If not specified, both ingress and egress traffic are monitored.
   ```
   R1(config-monitor)#source interface ce51 rx
   ```

4. Enable the configured session on the interface.
   ```
   no shut
   ```

ERSPAN Snippet Configuration

To verify the configuration and view the overall commands, use the `show running-config monitor` command.

```
R1#show running-config monitor
monitor destination erspan erspan_dest_1
  dest-ip 23.1.1.2
  vrf default
  origin-ip 69.69.69.69
  ttl 211
  dscp 50
```

```
   enable-truncate
   erspan-type 1
!
monitor session 1 type erspan-sender
 description R1 ERSPAN sender
 source interface ce51 rx
 destination erspan erspan_dest_1
 no shut
```

Validation

To verify the ERSPAN configuration, check the output of the `show monitor session 1` command.

```
#show monitor session 1
session 1
---------------
description : R1 ERSPAN sender
type : ERSPAN Sender
state : up
source intf :
tx :
rx : ge1
both :
source VLANs :
rx :
destination ERSPAN: erspan_dest_1
ERSPAN Type : 1
Dest IP addr : 172.16.12.2
Origin IP addr: 172.16.12.1
Dest VRF : default
ERSPAN ID : 0
DSCP : 50
TTL : 211
pkt truncate : Enabled
NextHop addr : 172.16.12.2
NextHop intf : ge3
filter count :
Legend: f = forwarding enabled, l = learning enabled
Sender#
```

CLI Commands

The ERSPAN feature introduces the following configuration commands.

destination ERSPAN

Use this command to configure the ERSPAN destination for an ERSPAN sender session. The destination must be already created using the command `monitor destination erspan`.

Use `no` form of this command to remove the ERSPAN destination from the session.

Command Syntax

```
destination erspan NAME
```

```
no destination erspan
```

Parameters

NAME   ERSPAN destination name mentioned in the command `monitor destination erspan`

Default

No default value is specified

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to configure the ERSPAN destination.

```
(config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#dest-ip 172.16.12.2
(config-erspan-dst)#origin-ip 172.16.12.1
(config-erspan-dst)#exit
(config)#monitor session 1 type erspan-sender
(config-monitor)#destination erspan erspan_dest_1

(config-monitor)#no destination erspan
```

ERSPAN origin ip

Use this command to set the origin IPv4/IPv6 of the ERSPAN tunnel.

Use `no` form of this command to unset the origin IPv4/IPv6 of the ERSPAN tunnel.

Command Syntax

```
origin-ip A.B.C.D/X:X::X:X

no origin-ip
```

Parameters

A.B.C.D/X:X::X:X   Origin IPv4/IPv6 address of the ERSPAN tunnel

Default

Disabled

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to set the origin IPv4/IPv6 of the ERSPAN tunnel.

```
(config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#origin-ip 172.16.12.1
(config-erspan-dst)#commit

(config-erspan-dst)#no origin-ip
(config-erspan-dst)#commit
```

ERSPAN destination ip

Use this command to set the destination IPv4/IPv6 of the ERSPAN tunnel.

Use `no` form of this command to unset the destination IPv4/IPv6 of the ERSPAN tunnel.

Command Syntax

```
dest-ip A.B.C.D/X:X::X:X
no dest-ip
```

Parameters

A.B.C.D/X:X::X:X	Destination IPv4/IPv6 address of the ERSPAN tunnel

Default

Disabled

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to set the destination IPv4/IPv6 of the ERSPAN tunnel.

```
(config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#dest-ip 172.16.12.1
(config-erspan-dst)#commit

(config-erspan-dst)#no dest-ip
(config-erspan-dst)#commit
```

ERSPAN vrf

Use this command to set the VRF where the ERSPAN tunnel will be created.

Use `no` form of this command to reset the VRF to default.

Command Syntax

```
vrf VRF_NAME
```

```
no vrf
```

Parameters

VRF_NAME   VRF name where the ERSPAN tunnel will be created

Default

Default

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to set the VRF where the ERSPAN tunnel will be created.

```
((config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#vrf custom_vrf_1
(config-erspan-dst)#commit

(config-erspan-dst)#no vrf
(config-erspan-dst)#commit
```

ERSPAN ip ttl

Use this command to set the Time To Live (TTL) value to use at the outer IP layer. This is an optional parameter that uses TTL value 255, if not specified.

Use `no` form of this command to reset the TTL value to 255.

Command Syntax

```
ttl <1-255>
no ttl
```

Parameters

<1-255>   TTL value to be used

Default

Value 255

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to set the TTL value to use at the outer IP layer.

```
(config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#ttl 25
(config-erspan-dst)#commit

(config-erspan-dst)#no ttl
(config-erspan-dst)#commit
```

ERSPAN ip dscp

Use this command to set the Differentiated Services Code Point (DSCP) value to use at the outer IP layer. This is an optional parameter that uses DSCP value 0, if not specified.

Use `no` form of this command to reset the DSCP value to 0.

Command Syntax

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

Parameters

`<0-63>`	DSCP value to be used

Default

Value 0

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to set the DSCP value to use at the outer IP layer.

```
(config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#dscp 42
(config-erspan-dst)#commit

(config-erspan-dst)#no dscp
(config-erspan-dst)#commit
```

ERSPAN enable truncate

Use this command to enable packet truncation when mirroring to the ERSPAN destination. When this flag is set, the original packet is truncated to 192 bytes and then encapsulated in ERSPAN.

Use `no` form of this command to disable packet truncate.

Command Syntax

```
enable-truncate

no enable-truncate
```

Parameters

None

Default

Disabled

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to enable the packet truncation.

```
(config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#enable-truncate
(config-erspan-dst)#commit

(config-erspan-dst)#no enable-truncate
(config-erspan-dst)#commit
```

ERSPAN type

Use this command to set the ERSPAN tunnel to Type 1 or Type 3. Note that ERSPAN Type 2 is not supported on XGS TD3 and TH/TH2 boards.

Use `no` form of this command to reset the ERSPAN type to the default value.

Command Syntax

```
erspan-type (1|3)

no erspan-type
```

Parameters

1	Use ERSPAN Type 1
3	Use ERSPAN Type 3

Default

Type 1

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to set the ERSPAN tunnel.

```
(config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#erspan-type 3
(config-erspan-dst)#commit

(config-erspan-dst)#no erspan-type
(config-erspan-dst)#commit
```

ERSPAN id

Use this command to set the ERSPAN ID to be used in the ERSPAN session. This is only relevant for ERSPAN Type 3. This is an optional parameter and the ERSPAN ID 0 is used, if not specified.

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

Command Syntax

```
erspan-id (1-1023)
no erspan-id
```

Parameters

<1-1023>	ERSPAN ID to be used

Default

Value 0

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to set the ERSPAN ID.

```
(config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#erspan-id 33
(config-erspan-dst)#commit

(config-erspan-dst)#no erspan-id
(config-erspan-dst)#commit
```

ERSPAN hardware id

Use this command to set the Hardware ID to be used. This is only relevant for ERSPAN Type 3.

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

Command Syntax

```
hardware-id (0-63)

no hardware-id
```

Parameters

`<1-63>`	Hardware ID to be used

Default

Value 0

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to set the Hardware ID.

```
(config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#hardware-id 12
(config-erspan-dst)#commit

(config-erspan-dst)#no hardware-id
(config-erspan-dst)#commit
```

ERSPAN switch id

Use this command to set value for the Switch ID to be used. This is only relevant for ERSPAN Type 3.

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

Command Syntax

```
switch-id (0-1023)

no switch-id
```

Parameters

`<1-1023>`	Switch ID to be used

Default

Value 0

Command Mode

Configure mode

Applicability

This command was introduced in OcNOS version 6.6.0.

Example

The following sequence of commands is used to set the Switch ID.

```
(config)#monitor destination erspan erspan_dest_1
(config-erspan-dst)#switch-id 112
(config-erspan-dst)#commit

(config-erspan-dst)#no switch-id
(config-erspan-dst)#commit
```

The below commands have been revised for ERSPAN. For more details, refer to the *Traffic Mirroring Commands* chapter.

- `monitor session`
- `show monitor session` - Example section

Glossary

The following table provides definitions for key terms or abbreviations and their meanings used throughout this document:

Key Terms/Acronym	Description
Switched Port Analyzer (SPAN)	A protocol that monitors the traffic on source port and sends a copy of the traffic to a destination port.
Remote Switched Port Analyzer (RSPAN)	A protocol that monitors the traffic distributed over multiple switches from the source ports.
Time to Live (TTL)	A limit on how long a piece of information can exist before it should be discarded.
Differentiated Services Code Point (DSCP)	A six-bit field in an IP header that enables allocation of resources on a per-packet basis.
Virtual Routing and Forwarding (VRF)	A technology that allows multiple data structures to co-exist within the same router at the same time.