Junos® OS

Ethernet Switching and Layer 2 Transparent Mode Feature Guide for Security Devices

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Junos® OS Ethernet Switching and Layer 2 Transparent Mode Feature Guide for Security Devices

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Table of Contents

List of Figures

List of Tables

About the Documentation

Documentation and Release Notes

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If the information in the latest release notes differs from the information in the documentation, follow the product Release Notes.

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Supported Platforms

For the features described in this document, the following platforms are supported:

- SRX Series
- vSRX

Using the Examples in This Manual

If you want to use the examples in this manual, you can use the **load merge** or the **load merge relative** command. These commands cause the software to merge the incoming configuration into the current candidate configuration. The example does not become active until you commit the candidate configuration.

If the example configuration contains the top level of the hierarchy (or multiple hierarchies), the example is a *full example*. In this case, use the **load merge** command.

If the example configuration does not start at the top level of the hierarchy, the example is a *snippet*. In this case, use the **load merge relative** command. These procedures are described in the following sections.

Merging a Full Example

To merge a full example, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration example into a text file, save the file with a name, and copy the file to a directory on your routing platform.

   For example, copy the following configuration to a file and name the file **ex-script.conf**. Copy the **ex-script.conf** file to the **/var/tmp** directory on your routing platform.

   ```
   system {
     scripts {
       commit {
         file ex-script.xsl;
       }
     }
   }
   interfaces {
     fxp0 {
       disable;
       unit 0 {
         family inet {
           address 10.0.0.1/24;
         }
       }
     }
   }
   ```

2. Merge the contents of the file into your routing platform configuration by issuing the **load merge** configuration mode command:

   ```
   [edit]
   user@host# load merge /var/tmp/ex-script.conf
   load complete
   ```

Merging a Snippet

To merge a snippet, follow these steps:

1. From the HTML or PDF version of the manual, copy a configuration snippet into a text file, save the file with a name, and copy the file to a directory on your routing platform.

   For example, copy the following snippet to a file and name the file **ex-script-snippet.conf**. Copy the **ex-script-snippet.conf** file to the **/var/tmp** directory on your routing platform.

   ```
   commit {
     file ex-script-snippet.xsl; }
   ```

2. Move to the hierarchy level that is relevant for this snippet by issuing the following configuration mode command:

```
[edit]
user@host# edit system scripts
[edit system scripts]
```

3. Merge the contents of the file into your routing platform configuration by issuing the **load merge relative** configuration mode command:

```
[edit system scripts]
user@host# load merge relative /var/tmp/ex-script-snippet.conf
load complete
```

For more information about the **load** command, see CLI Explorer.

Documentation Conventions

Table 1 on page xiii defines notice icons used in this guide.

Table 1: Notice Icons

Icon	Meaning	Description
	Informational note	Indicates important features or instructions.
	Caution	Indicates a situation that might result in loss of data or hardware damage.
	Warning	Alerts you to the risk of personal injury or death.
	Laser warning	Alerts you to the risk of personal injury from a laser.
	Tip	Indicates helpful information.
	Best practice	Alerts you to a recommended use or implementation.

Table 2 on page xiii defines the text and syntax conventions used in this guide.

Table 2: Text and Syntax Conventions

Convention	Description	Examples
Bold text like this	Represents text that you type.	To enter configuration mode, type the **configure** command: user@host> **configure**

Table 2: Text and Syntax Conventions *(continued)*

Convention	Description	Examples
`Fixed-width text like this`	Represents output that appears on the terminal screen.	`user@host>` **show chassis alarms** `No alarms currently active`
Italic text like this	• Introduces or emphasizes important new terms. • Identifies guide names. • Identifies RFC and Internet draft titles.	• A policy *term* is a named structure that defines match conditions and actions. • *Junos OS CLI User Guide* • RFC 1997, *BGP Communities Attribute*
Italic text like this	Represents variables (options for which you substitute a value) in commands or configuration statements.	Configure the machine's domain name: [edit] root@# **set system domain-name** *domain-name*
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	• To configure a stub area, include the **stub** statement at the **[edit protocols ospf area area-id]** hierarchy level. • The console port is labeled **CONSOLE**.
< > (angle brackets)	Encloses optional keywords or variables.	**stub <default-metric** ***metric*****>;**
| (pipe symbol)	Indicates a choice between the mutually exclusive keywords or variables on either side of the symbol. The set of choices is often enclosed in parentheses for clarity.	**broadcast | multicast** **(*string1* | *string2* | *string3*)**
# (pound sign)	Indicates a comment specified on the same line as the configuration statement to which it applies.	**rsvp { # Required for dynamic MPLS only**
[ ] (square brackets)	Encloses a variable for which you can substitute one or more values.	**community name members [** ***community-ids*** **]**

Indention and braces ({ })	Identifies a level in the configuration hierarchy.	[edit]
		routing-options {
		  static {
		  route default {
		  nexthop *address*;
		  retain;
		  }
		  }
		}

; (semicolon)	Identifies a leaf statement at a configuration hierarchy level.	
GUI Conventions		
Bold text like this	Represents graphical user interface (GUI) items you click or select.	• In the Logical Interfaces box, select **All Interfaces**. • To cancel the configuration, click **Cancel**.

Table 2: Text and Syntax Conventions *(continued)*

Convention	Description	Examples
> (bold right angle bracket)	Separates levels in a hierarchy of menu selections.	In the configuration editor hierarchy, select **Protocols>Ospf**.

Documentation Feedback

We encourage you to provide feedback, comments, and suggestions so that we can improve the documentation. You can provide feedback by using either of the following methods:

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- E-mail—Send your comments to **techpubs-comments@juniper.net**. Include the document or topic name, URL or page number, and software version (if applicable).

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or Partner Support Service support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

- JTAC policies—For a complete understanding of our JTAC procedures and policies, review the *JTAC User Guide* located at http://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf.
- Product warranties—For product warranty information, visit http://www.juniper.net/support/warranty/.
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Self-Help Online Tools and Resources

For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: http://www.juniper.net/customers/support/
- Search for known bugs: http://www2.juniper.net/kb/
- Find product documentation: http://www.juniper.net/techpubs/
- Find solutions and answer questions using our Knowledge Base: http://kb.juniper.net/

- Download the latest versions of software and review release notes: http://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: http://kb.juniper.net/InfoCenter/
- Join and participate in the Juniper Networks Community Forum: http://www.juniper.net/company/communities/
- Open a case online in the CSC Case Management tool: http://www.juniper.net/cm/

To verify service entitlement by product serial number, use our Serial Number Entitlement (SNE) Tool: https://tools.juniper.net/SerialNumberEntitlementSearch/

Opening a Case with JTAC

You can open a case with JTAC on the Web or by telephone.

- Use the Case Management tool in the CSC at http://www.juniper.net/cm/.
- Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).

For international or direct-dial options in countries without toll-free numbers, see http://www.juniper.net/support/requesting-support.html.

PART 1

Overview

CHAPTER 1

Introduction to Switching and Layer 2 Transparent Mode

Ethernet Switching and Layer 2 Transparent Mode Overview

Supported Platforms SRX Series, vSRX

Layer 2 transparent mode provides the ability to deploy the firewall without making changes to the existing routing infrastructure. The firewall is deployed as a Layer 2 switch with multiple VLAN segments and provides security services within VLAN segments. Secure-wire is a special version of Layer 2 transparent mode that allows bump-in-wire deployment.

Ethernet switching forwards the Ethernet frames within or across the LAN segment (or VLAN) using the Ethernet MAC address information. Ethernet switching on the SRX1500 device is performed in the hardware using ASICs.

Starting in Junos OS Release 15.1X49-D40, use the **set protocols l2-learning global-mode(transparent-bridge | switching)** command to switch between the Layer 2 transparent bridge mode and Ethernet switching mode. After switching the mode, you must reboot the device for the configuration to take effect.

NOTE: **The default mode for Layer 2 is transparent mode.**

The Layer 2 protocol supported in switching mode is Link Aggregation Control Protocol (LACP).

You can configure Layer 2 transparent mode on a redundant Ethernet interface. Use the following commands to define a redundant Ethernet interface:

- **set interfaces *interface-name* ether-options redundant-parent *reth-interface-name***
- **set interfaces *reth-interface-name* redundant-ether-options redundancy-group *number***

Release History Table

Release	Description
15.1X49-D40	Starting in Junos OS Release 15.1X49-D40, use the **set protocols l2-learning global-mode(transparent-bridge | switching)** command to switch between the Layer 2 transparent bridge mode and Ethernet switching mode.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- **global-mode (Protocols) on page 141**
- **l2-learning (Protocols) on page 147**

CHAPTER 2

Configuring Interfaces

Understanding Layer 2 Interfaces

Supported Platforms SRX Series, vSRX

Layer 2 logical interfaces are created by defining one or more logical units on a physical interface with the family address type **ethernet-switching**. If a physical interface has a **ethernet-switching** family logical interface, it cannot have any other family type in its logical interfaces. A logical interface can be configured in one of the following modes:

- Access mode—Interface accepts untagged packets, assigns the specified VLAN identifier to the packet, and forwards the packet within the VLAN that is configured with the matching VLAN identifier.
- Trunk mode—Interface accepts any packet tagged with a VLAN identifier that matches a specified list of VLAN identifiers. Trunk mode interfaces are generally used to interconnect switches. To configure a VLAN identifier for untagged packets received on the physical interface, use the **native-vlan-id** option. If the **native-vlan-id** option is not configured, untagged packets are dropped.

NOTE: Multiple trunk mode logical interfaces can be defined, as long as the VLAN identifiers of a trunk interface do not overlap with those of another trunk interface. The native-vlan-id must belong to a VLAN identifier list configured for a trunk interface.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Example: Configuring Layer 2 Logical Interfaces on page 6
- Understanding Transparent Mode Conditions on page 27

Example: Configuring Layer 2 Logical Interfaces

Supported Platforms SRX Series, vSRX

This example shows how to configure a Layer 2 logical interface as a trunk port so that the incoming packets can be selectively redirected to a firewall or other security device.

Requirements

Before you begin, configure the VLANs. See "Example: Configuring VLANs" on page 31.

Overview

In this example, you configure logical interface ge-3/0/0.0 as a trunk port that carries traffic for packets tagged with VLAN identifiers 1 through 10; this interface is implicitly assigned to the previously configured VLANs vlan-a and vlan-b. Then you assign a VLAN ID of 10 to any untagged packets received on physical interface ge-3/0/0.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set unit 0 family ethernet-switching interface-mode trunk vlan members 1–10
set vlan-tagging native-vlan-id 10
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a Layer 2 logical interface as a trunk port:

1. Configure the logical interface.

   ```
   [edit interfaces ge-3/0/0]
   user@host# set unit 0 family ethernet-switching interface-mode trunk vlan members
     1–10
   ```

2. Specify a VLAN ID for untagged packets.

```
[edit interfaces ge-3/0/0]
user@host# set vlan-tagging native-vlan-id 10
```

3. If you are done configuring the device, commit the configuration.

```
[edit]
user@host# commit
```

Verification

To verify the configuration is working properly, enter the **show interfaces ge-3/0/0** and **show interfaces ge-3/0/0.0** commands.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Layer 2 Interfaces on page 5
- Understanding Transparent Mode Conditions on page 27
- Example: Configuring Layer 2 Security Zones on page 36

Understanding VLAN Retagging

Supported Platforms SRX Series, vSRX

NOTE: Starting in Junos OS Release 15.1X49-D40 VLAN retagging is no longer supported.

The VLAN identifier in packets arriving on a Layer 2 trunk port can be rewritten or “retagged” with a different internal VLAN identifier. VLAN retagging is a symmetric operation; upon exiting the same trunk port, the retagged VLAN identifier is replaced with the original VLAN identifier. VLAN retagging provides a way to selectively screen incoming packets and redirect them to a firewall or other security device without affecting other VLAN traffic.

VLAN retagging can be applied only to interfaces configured as Layer 2 trunk interfaces. These interfaces can include redundant Ethernet interfaces in a Layer 2 transparent mode chassis cluster configuration.

NOTE: If a trunk port is configured for VLAN retagging, untagged packets received on the port cannot be assigned a VLAN identifier with the VLAN retagging configuration. To configure a VLAN identifier for untagged packets received on the physical interface, use the native-vlan-id statement.

To configure VLAN retagging for a Layer 2 trunk interface, specify a one-to-one mapping of the following:

- Incoming VLAN identifier—VLAN identifier of the incoming packet that is to be retagged. This VLAN identifier must not be the same VLAN identifier configured with the **native-vlan-id** statement for the trunk port.
- Internal VLAN identifier—VLAN identifier for the retagged packet. This VLAN identifier must be in the VLAN identifier list for the trunk port and must not be the same VLAN identifier configured with the **native-vlan-id** statement for the trunk port.

Release History Table

Release	Description
15.1X49-D40	Starting in Junos OS Release 15.1X49-D40 VLAN retagging is no longer supported.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Example: Configuring VLAN Retagging for Layer 2 Transparent Mode on page 8
- Example: Configuring Layer 2 Logical Interfaces on page 6

Example: Configuring VLAN Retagging for Layer 2 Transparent Mode

Supported Platforms SRX Series, vSRX

This example shows how to configure VLAN retagging on a Layer 2 trunk interface to selectively screen incoming packets and redirect them to a security device without affecting other VLAN traffic.

Requirements

Before you begin, determine the mapping you want to include for the VLAN retagging. See "Understanding VLAN Retagging" on page 7.

NOTE: **Starting in Junos OS Release 15.1X49-D40 VLAN retagging is no longer supported.**

Overview

In this example, you create a Layer 2 trunk interface called ge-3/0/0 and configure it to receive packets with VLAN identifiers 1 through 10. Packets that arrive on the interface with VLAN identifier 11 are retagged with VLAN identifier 2. Before exiting the trunk interface, VLAN identifier 2 in the retagged packets is replaced with VLAN identifier 11. All VLAN identifiers in the retagged packets change back when you exit the trunk interface.

Configuration

Step-by-Step Procedure

To configure VLAN retagging on a Layer 2 trunk interface:

1. Create a Layer 2 trunk interface.

```
[edit]
user@host#set interfaces ge-3/0/0 unit 0 family ethernet-switching interface-mode
  trunk vlan members 1–10
```

2. Configure VLAN retagging.

```
[edit]
user@host#set interfaces ge-3/0/0 unit 0 family ethernet-switching vlan-rewrite
  translate 11 2
```

3. If you are done configuring the device, commit the configuration.

```
[edit]
user@host# commit
```

Verification

To verify the configuration is working properly, enter the **show interfaces ge-3/0/0** command.

Release History Table

Release	Description
15.1X49-D40	Starting in Junos OS Release 15.1X49-D40 VLAN retagging is no longer supported.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Example: Configuring Layer 2 Logical Interfaces on page 6

Understanding Integrated Routing and Bridging Interfaces

Supported Platforms SRX Series, vSRX

For VLANs configured with a single VLAN identifier, you can optionally configure an integrated routing and bridging (IRB) interface for management traffic in the VLAN. An IRB interface acts as a Layer 3 routing interface for a VLAN.

NOTE: If you specify a VLAN identifier list in the VLAN configuration, you cannot configure an IRB interface for the VLAN.

Packets arriving on a Layer 2 interface that are destined for the device's MAC address are classified as Layer 3 traffic while packets that are not destined for the device's MAC address are classified as Layer 2 traffic. Packets destined for the device's MAC address

are sent to the IRB interface. Packets from the device's routing engine are sent out the IRB interface.

You create an IRB logical interface in a similar manner as a Layer 3 interface, but the IRB interface does not support traffic forwarding or routing. The IRB interface cannot be assigned to a security zone; however, you can configure certain services on a per-zone basis to allow host-inbound traffic for management of the device. This allows you to control the type of traffic that can reach the device from interfaces bound to a specific zone.

NOTE:

- On SRX1400, SRX1500, SRX3400, SRX3600, SRX5600, and SRX5800 devices, we support an IRB interface that allows you to terminate management connections in transparent mode. However, you cannot route traffic on that interface or terminate IPsec VPNs. (Platform support depends on the Junos OS release in your installation.)
- You can configure only one IRB logical interface for each VLAN.

NOTE: On SRX300, SRX320, SRX340, SRX345 devices, and SRX550M on the IRB interface, the following features are not supported:

- IS-IS (family ISO)
- Encapsulations (Ether CCC, VLAN CCC, VPLS, PPPoE, and so on) on VLAN interfaces
- CLNS
- DVMRP
- VLAN interface MAC change
- G-ARP
- Change VLAN-Id for VLAN interface

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Example: Configuring an IRB Interface on page 10
- Understanding VLANs on page 29
- Example: Configuring VLANs on page 31

Example: Configuring an IRB Interface

Supported Platforms SRX Series, vSRX

This example shows how to configure an IRB interface so it can act as a Layer 3 routing interface for a VLAN.

Requirements

Before you begin, configure a VLAN with a single VLAN identifier. See "Example: Configuring VLANs" on page 31.

Overview

In this example, you configure the IRB logical interface unit 0 with the family type inet and IP address 10.1.1.1/24, and then reference the IRB interface irb.10 in the vlan10 configuration. Then you enable Web authentication on the IRB interface and activate the webserver on the device.

NOTE: To complete the Web authentication configuration, you must perform the following tasks:

- Define the access profile and password for a Web authentication client.
- Define the security policy that enables Web authentication for the client.

Either a local database or an external authentication server can be used as the Web authentication server.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set interfaces ge-1/0/0 unit 0 family ethernet-switching interface-mode trunk
set interfaces ge-1/0/0 unit 0 family ethernet-switching vlan members 10
set interface irb unit 0 family inet address 10.1.1.1/24 web-authentication http
set vlans vlan10 vlan-id 10
set vlans vlan10 l3-interface irb.10
set system services web-management http
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure an IRB interface:

1. Create a Layer 2 trunk interface.

```
[edit]
user@host# set interfaces ge-1/0/0 unit 0 family ethernet-switching interface-mode
  trunk
user@host# set interfaces ge-1/0/0 unit 0 family ethernet-switching vlan members
  10
```

2. Create an IRB logical interface.

```
[edit]
user@host# set interface irb unit 0 family inet address 10.1.1.1/24 web-authentication
  http
```

3. Create a Layer 2 VLAN.

```
[edit]
user@host# set vlans vlan10 vlan-id 10
```

4. Associate the IRB interface with the VLAN.

```
[edit]
user@host# set vlans vlan10 l3-interface irb.10
```

5. Activate the webserver.

```
[edit]
user@host# set system services web-management http
```

6. If you are done configuring the device, commit the configuration.

```
[edit]
user@host# commit
```

Verification

To verify the configuration is working properly, enter the **show interface irb** , and **show vlans** commands.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Integrated Routing and Bridging Interfaces on page 9
- Example: Configuring Layer 2 Security Zones on page 36
- Understanding VLANs on page 29

Understanding Mixed Mode (Layer 2 and Layer 3)

Supported Platforms SRX Series, vSRX

Mixed mode supports both Layer 2 and Layer 3 interfaces; it is the default mode. You can configure both Layer 2 and Layer 3 interfaces simultaneously using separate security zones.

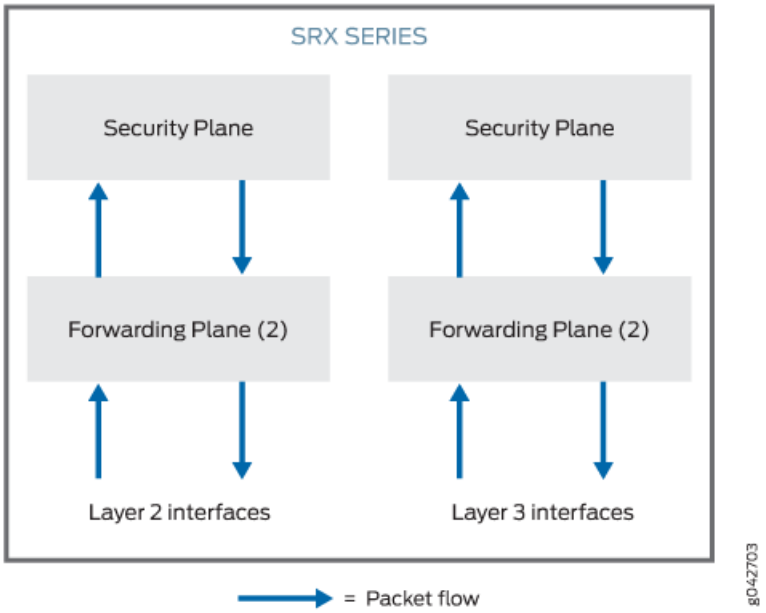
NOTE: For the mixed mode configuration, you must reboot the device after you commit the changes. However, for SRX5000 line devices, reboot is not required.

In mixed mode (Layer 2 and Layer 3):

- There is no routing among IRB interfaces and between IRB interfaces and Layer 3 interfaces.
- The user logical system is not supported for Layer 2 traffic. However, you can configure Layer 2 traffic using the root logical system.
- You can configure Layer 3 interfaces using both the user logical system and the root logical system.

The device in Figure 1 on page 13 looks like two separate devices. One device runs in Layer 2 mode and the other device runs in Layer 3 mode. But both devices run independently. Packets cannot be transferred between the Layer 2 and Layer 3 interfaces, because there is no routing among IRB interfaces and between IRB interfaces and Layer 3 interfaces.

Figure 1: Architecture of Mixed Layer 2 and Layer 3 Mode



In mixed mode, the Ethernet physical interface can be either a Layer 2 interface or a Layer 3 interface, but the Ethernet physical interface cannot be both simultaneously. However, Layer 2 and Layer 3 families can exist on separate physical interfaces on the same device.

Table 3 on page 13 lists the Ethernet physical interface types and supported family types.

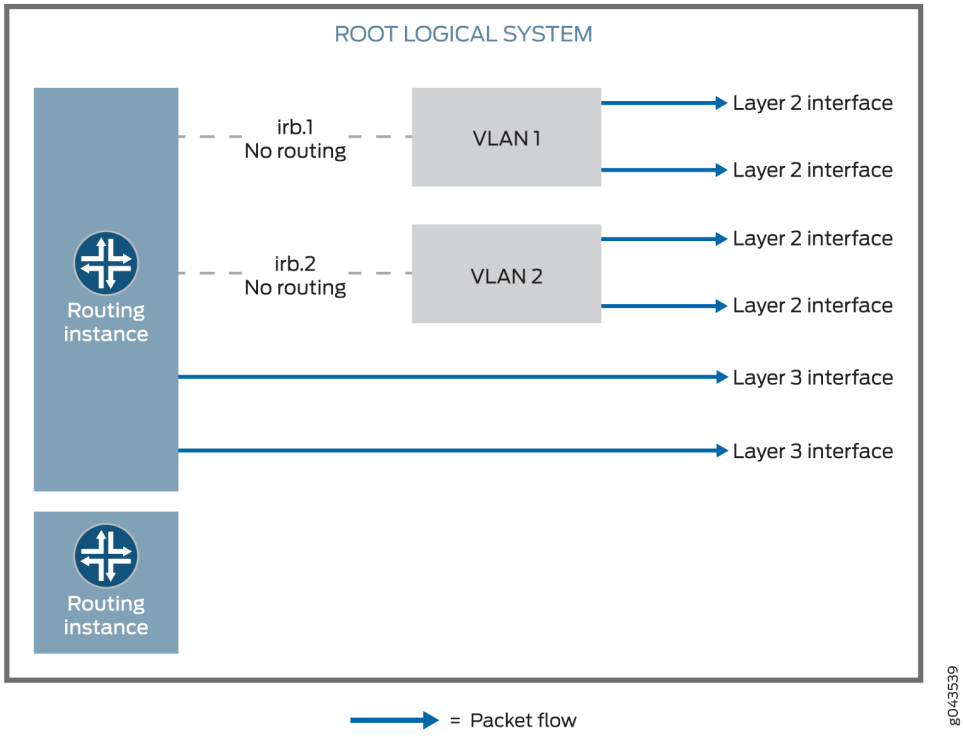
Table 3: Ethernet Physical Interface and Supported Family Types

Ethernet Physical Interface Type	Supported Family Type
Layer 2 Interface	**ethernet-switching**
Layer 3 Interface	**inet** and **inet6**

NOTE: Multiple routing instances are supported.

You can configure both the pseudointerface **irb.x** and the Layer 3 interface under the same default routing instance using either a default routing instance or a user-defined routing instance. See Figure 2 on page 14.

Figure 2: Mixed Layer 2 and Layer 3 Mode



Packets from the Layer 2 interface are switched within the same VLAN, or they connect to the host through the IRB interface. Packets cannot be routed to another IRB interface or a Layer 3 interface through their own IRB interface.

Packets from the Layer 3 interface are routed to another Layer 3 interface. Packets cannot be routed to a Layer 2 interface through an IRB interface.

Table 4 on page 15 lists the security features that are supported in mixed mode and the features that are not supported in transparent mode for Layer 2 switching.

Table 4: Security Features Supported in Mixed Mode (Layer 2 and Layer 3)

Mode Type	Supported	Not Supported
Mixed mode	• Application Layer Gateways (ALGs) • Firewall User Authentication (FWAUTH) • Intrusion Detection and Prevention (IDP) • Screen • AppSecure	• Unified Threat Management (UTM)
Layer 3 interface of mixed mode	• Network Address Translation (NAT) • VPN	—
Layer 2 mode (transparent mode)		• Network Address Translation (NAT) • VPN • Unified Threat Management (UTM)

Starting in Junos OS Release 12.3X48-D10, some conditions apply to mixed-mode operations. Note the conditions here:

- On all branch SRX Series devices, you cannot configure Ethernet switching and virtual private LAN service (VPLS) using mixed mode (Layer 2 and Layer 3).
- On all high-end SRX Series devices, you do not have to reboot the device when you configure VLAN.

Release History Table

Release	Description
12.3X48-D10	Starting in Junos OS Release 12.3X48-D10, some conditions apply to mixed-mode operations.

Related Documentation

- Example: Improving Security Services by Configuring an SRX Series Device Using Mixed Mode (Layer 2 and Layer 3) on page 15
- Understanding Secure Wire on page 71

Example: Improving Security Services by Configuring an SRX Series Device Using Mixed Mode (Layer 2 and Layer 3)

Supported Platforms SRX Series, vSRX

You can configure an SRX Series device using both Layer 2 and Layer 3 interfaces simultaneously to simplify deployments and to improve security services.

This example shows how to pass the Layer 2 traffic from interface ge-0/0/1.0 to interface ge-0/0/0.0 and Layer 3 traffic from interface ge-0/0/2.0 to interface ge-0/0/3.0.

Requirements

This example uses the following hardware and software components:

- An SRX Series device
- Four PCs

Before you begin:

- Create a separate security zone for Layer 2 and Layer 3 interfaces. See "Understanding Layer 2 Security Zones" on page 35.

Overview

In enterprises where different business groups have either Layer 2 or Layer 3 based security solutions, using a single mixed mode configuration simplifies their deployments. In a mixed mode configuration, you can also provide security services with integrated switching and routing.

In addition, you can configure an SRX Series device in both standalone and chassis cluster mode using mixed mode.

In mixed mode (default mode), you can configure both Layer 2 and Layer 3 interfaces simultaneously using separate security zones.

NOTE: **For the mixed mode configuration, you must reboot the device after you commit the changes. However, for SRX5000 line devices, reboot is not required.**

In this example, first you configure a Layer 2 family type called Ethernet switching to identify Layer 2 interfaces. You set the IP address 10.10.10.1/24 to IRB interface. Then you create zone L2 and add Layer 2 interfaces ge-0/0/1.0 and ge-0/0/0.0 to it.

Next you configure a Layer 3 family type inet to identify Layer 3 interfaces. You set the IP address 192.0.2.1/24 to interface ge-0/0/2.0 and the IP address 192.0.2.3/24 to interface ge-0/0/3. Then you create zone L3 and add Layer 3 interfaces ge-0/0/2.0 and ge-0/0/3.0 to it.

Topology

Figure 3 on page 17 shows a mixed mode topology.

Figure 3: Mixed Mode Topology

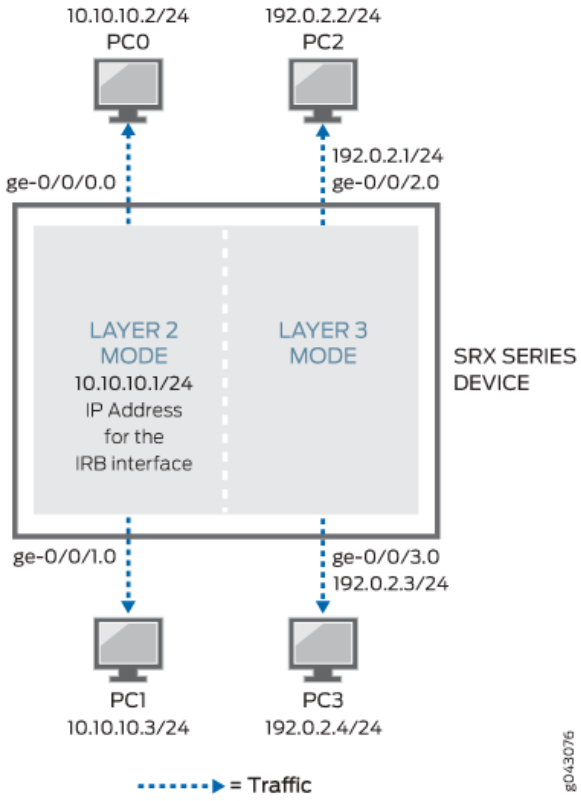


Table 5 on page 17 shows the parameters configured in this example.

Table 5: Layer 2 and Layer 3 Parameters

Parameter	Description
L2	Layer 2 zone.
ge-0/0/1.0 and ge-0/0/0.0	Layer 2 interfaces added to the Layer 2 zone.
L3	Layer 3 zone.
ge-0/0/2.0 and ge-0/0/3.0	Layer 3 interfaces added to the Layer 3 zone.
10.10.10.1/24	IP address for the IRB interface.
192.0.2.1/24 and 192.0.2.3/24	IP addresses for the Layer 3 interface.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set interfaces ge-0/0/0 unit 0 family ethernet-switching interface-mode access
set interfaces ge-0/0/0 unit 0 family ethernet-switching vlan members 10
set interfaces ge-0/0/1 unit 0 family ethernet-switching interface-mode access
set interfaces ge-0/0/1 unit 0 family ethernet-switching vlan members 10
set interfaces irb unit 10 family inet address 10.10.10.1/24
set security zones security-zone L2 interfaces ge-0/0/1.0
set security zones security-zone L2 interfaces ge-0/0/0.0
set vlans vlan-10 vlan-id 10
set vlans vlan-10 l3-interface irb.10
set interfaces ge-0/0/2 unit 0 family inet address 192.0.2.1/24
set interfaces ge-0/0/3 unit 0 family inet address 192.0.2.3/24
set security policies default-policy permit-all
set security zones security-zone L2 host-inbound-traffic system-services any-service
set security zones security-zone L2 host-inbound-traffic protocols all
set security zones security-zone L3 host-inbound-traffic system-services any-service
set security zones security-zone L3 host-inbound-traffic protocols all
set security zones security-zone L3 interfaces ge-0/0/2.0
set security zones security-zone L3 interfaces ge-0/0/3.0
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure Layer 2 and Layer 3 interfaces:

1. Create a Layer 2 family type to configure Layer 2 interfaces.

   ```
   [edit interfaces]
   user@host#set ge-0/0/0 unit 0 family ethernet-switching interface-mode access
   user@host#set ge-0/0/0 unit 0 family ethernet-switching vlan members 10
   user@host#set ge-0/0/1 unit 0 family ethernet-switching interface-mode access
   user@host#set ge-0/0/1 unit 0 family ethernet-switching vlan members 10
   ```

2. Configure an IP address for the IRB interface.

   ```
   [edit interfaces]
   user@host# set irb unit 10 family inet address 10.10.10.1/24
   ```

3. Configure Layer 2 interfaces.

   ```
   [edit security zones security-zone L2 interfaces]
   user@host# set ge-0/0/1.0
   user@host# set ge-0/0/0.0
   ```

4. Configure VLAN.

   ```
   [edit vlans vlan-10]
   user@host# set vlan-id 10
   user@host# set l3-interface irb.10
   ```

5. Configure IP addresses for Layer 3 interfaces.

```
[edit interfaces]
user@host# set ge-0/0/2.0 unit 0 family inet address 192.0.2.1/24
user@host# set ge-0/0/3.0 unit 0 family inet address 192.0.2.3/24
```

6. Configure the policy to permit the traffic.

```
[edit security policies]
user@host#set default-policy permit-all
```

7. Configure Layer 3 interfaces.

```
[edit security zones security-zone]
user@host# set L2 host-inbound-traffic system-services any-service
user@host# set L2 host-inbound-traffic protocols all
user@host# set L3 host-inbound-traffic system-services any-service
user@host# set L3 host-inbound-traffic protocols all
user@host# set L3 interfaces ge-0/0/2.0
user@host# set L3 interfaces ge-0/0/3.0
```

Results From configuration mode, confirm your configuration by entering the **show interfaces**, **show security policies**, **show vlans**, and **show security zones** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
[edit]
user@host# show interfaces
  ge-0/0/0 {
    unit 0 {
      family ethernet-switching {
        interface-mode access;
        vlan-id 10;
      }
    }
  }
  ge-0/0/1 {
    unit 0 {
      family ethernet-switching {
        interface-mode access;
        vlan-id 10;
      }
    }
  }
  ge-0/0/2 {
    unit 0 {
      family inet {
        address 192.0.2.1/24;
      }
    }
  }
  ge-0/0/3 {
    unit 0 {
      family inet {
        address 192.0.2.2/24;
      }
    }
  }
```

```
    irb {
      unit 10 {
        family inet {
          address 10.10.10.1/24;
        }
      }
    }
[edit]
user@host#  show security policies
default-policy {
  permit-all;
}
[edit]
user@host# show vlans
  vlan-10 {
    vlan-id 10;
    l3-interface irb.10;
  }
[edit]
user@host#  show security zones
  security-zone L2 {
    host-inbound-traffic {
      system-services {
        any-service;
      }
      protocols {
        all;
      }
    }
    interfaces {
      ge-0/0/1.0;
      ge-0/0/0.0;
    }
  }
  security-zone L3 {
    host-inbound-traffic {
      system-services {
        any-service;
      }
      protocols {
        all;
      }
    }
    interfaces {
      ge-0/0/2.0;
      ge-0/0/3.0;
    }
  }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

Verifying the Layer 2 and Layer 3 Interfaces and Zones

Purpose Verify that the Layer 2 and Layer 3 interfaces and Layer 2 and Layer 3 zones are created.

Action From operational mode, enter the **show security zones** command.

```
user@host>show security zones
 Security zone: HOST
  Send reset for non-SYN session TCP packets: Off
  Policy configurable: Yes
  Interfaces bound: 0
  Interfaces:

Security zone: L2
  Send reset for non-SYN session TCP packets: Off
  Policy configurable: Yes
  Interfaces bound: 2
  Interfaces:
    ge-0/0/0.0
    ge-0/0/1.0

Security zone: L3
  Send reset for non-SYN session TCP packets: Off
  Policy configurable: Yes
  Interfaces bound: 2
  Interfaces:
    ge-0/0/2.0
    ge-0/0/3.0

Security zone: junos-host
  Send reset for non-SYN session TCP packets: Off
  Policy configurable: Yes
  Interfaces bound: 0
  Interfaces:
```

Meaning The output shows the Layer 2 (L2) and Layer 3 (L3) zone names and the number and names of Layer 2 and Layer 3 interfaces bound to the L2 and L3 zones.

Verifying the Layer 2 and Layer 3 Session

Purpose Verify that the Layer 2 and Layer 3 sessions are established on the device.

Action From operational mode, enter the **show security flow session** command.

```
user@host>show security flow session
Session ID: 130000050, Policy name: default-policy-00/2, Timeout: 2, Valid
  In: 10.10.10.2/22 --> 10.10.10.3/28;icmp, If: ge-0/0/0.0, Pkts: 1, Bytes: 98
  Out: 10.10.10.3/245 --> 10.10.10.2/248;icmp, If: ge-0/0/1.0, Pkts: 1, Bytes:
98

Session ID: 130000051, Policy name: default-policy-02/2, Timeout: 4, Valid
  In: 192.0.2.1/17 --> 192.0.2.2/19;icmp, If: ge-0/0/2.0, Pkts: 1, Bytes: 84
Out: 192.0.2.2/212 --> 192.0.2.1/218;icmp, If: ge-0/0/3.0, Pkts: 1, Bytes: 84
```

Meaning The output shows active sessions on the device and each session's associated security policy.

- **Session ID 130000050**—Number that identifies the Layer 2 session. Use this ID to get more information about the Layer 2 session such as policy name or number of packets in and out.
- **default-policy-00/2**—Default policy name that permitted the Layer 2 traffic.
- **In**—Incoming flow (source and destination Layer 2 IP addresses with their respective source and destination port numbers, session is ICMP, and the source interface for this session is ge-0/0/0.0).
- **Out**—Reverse flow (source and destination Layer 2 IP addresses with their respective source and destination port numbers, session is ICMP, and destination interface for this session is ge-0/0/1.0).
- **Session ID 130000051**—Number that identifies the Layer 3 session. Use this ID to get more information about the Layer 3 session such as policy name or number of packets in and out.
- **default-policy-02/2**—Default policy name that permitted the Layer 3 traffic.
- **In**—Incoming flow (source and destination Layer 3 IP addresses with their respective source and destination port numbers, session is ICMP, and the source interface for this session is ge-0/0/2.0).
- **Out**—Reverse flow (source and destination Layer 3 IP addresses with their respective source and destination port numbers, session is ICMP, and destination interface for this session is ge-0/0/3.0).

Related Documentation

- Understanding Mixed Mode (Layer 2 and Layer 3) on page 12
- Understanding Secure Wire on page 71

PART 2

Configuring Layer 2 Transparent Mode

CHAPTER 3

Configuring Transparent Mode

Layer 2 Transparent Mode Overview

Supported Platforms SRX Series, vSRX

For SRX Series devices, transparent mode provides full security services for Layer 2 switching capabilities. On these SRX Series devices, you can configure one or more VLANs to perform Layer 2 switching. A VLAN is a set of logical interfaces that share the same flooding or broadcast characteristics. Like a virtual LAN (VLAN), a VLAN spans one or more ports of multiple devices. Thus, the SRX Series device can function as a Layer 2 switch with multiple VLANs that participate in the same Layer 2 network.

In transparent mode, the SRX Series device filters packets that traverse the device without modifying any of the source or destination information in the IP packet headers. Transparent mode is useful for protecting servers that mainly receive traffic from untrusted sources because there is no need to reconfigure the IP settings of routers or protected servers.

In transparent mode, all physical ports on the device are assigned to Layer 2 interfaces. Do not route Layer 3 traffic through the device. Layer 2 zones can be configured to host Layer 2 interfaces, and security policies can be defined between Layer 2 zones. When packets travel between Layer 2 zones, security policies can be enforced on these packets.

Table 6 on page 26 lists the security features that are supported and are not supported in transparent mode for Layer 2 switching.

Table 6: Security Features Supported in Transparent Mode

Mode Type	Supported	Not Supported
Transparent mode	• Application Layer Gateways (ALGs) • Firewall User Authentication (FWAUTH) • Intrusion Detection and Prevention (IDP) • Screen • AppSecure	• Network Address Translation (NAT) • VPN • Unified Threat Management (UTM)

NOTE:

- On all SRX Series devices, transparent mode is not supported on mPIMs.
- On all branch SRX Series devices, the DHCP server propagation is not supported in Layer 2 transparent mode.

Layer 2 Switching Exceptions on SRX Series Devices

The switching functions on the SRX Series devices are similar to the switching features on Juniper Networks MX Series routers. However, the following Layer 2 networking features on MX Series routers are not supported on SRX Series devices:

- Layer 2 control protocols—These protocols are used on MX Series routers for Rapid Spanning Tree Protocol (RSTP) or Multiple Spanning Tree Protocol (MSTP) in customer edge interfaces of a VPLS routing instance.
- Virtual switch routing instance—The virtual switching routing instance is used on MX Series routers to group one or more VLANs.
- Virtual private LAN services (VPLS) routing instance—The VPLS routing instance is used on MX Series routers for point-to-multipoint LAN implementations between a set of sites in a VPN.

In addition, the SRX Series devices do not support the following Layer 2 features:

- Spanning Tree Protocol (STP), RSTP, or MSTP—It is the user's responsibility to ensure that no flooding loops exist in the network topology.
- Internet Group Management Protocol (IGMP) snooping—Host-to-router signaling protocol for IPv4 used to report their multicast group memberships to neighboring routers and determine whether group members are present during IP multicasting.
- Double-tagged VLANs or IEEE 802.1Q VLAN identifiers encapsulated within 802.1Q packets (also called "Q in Q" VLAN tagging)—Only untagged or single-tagged VLAN identifiers are supported on SRX Series devices.
- Nonqualified VLAN learning, where only the MAC address is used for learning within the VLAN—VLAN learning on SRX Series devices is qualified; that is, both the VLAN identifier and MAC address are used.

Also, on SRX100, SRX110, SRX210, SRX220, SRX240, SRX300, SRX320, SRX340, SRX345, SRX550, or SRX650 devices, some features are not supported. (Platform support depends on the Junos OS release in your installation.) The following features are not supported for Layer 2 transparent mode on the mentioned devices:

- G-ARP on the Layer 2 interface
- IP address monitoring on any interface
- Transit traffic through IRB
- IRB interface in a routing instance
- IRB interface handling of Layer 3 traffic

NOTE: The IRB interface is a pseudointerface and does not belong to the reth interface and redundancy group.

Layer 2 Transparent Mode on the SRX5000 Line Module Port Concentrator

The SRX5000 line Module Port Concentrator (SRX5K-MPC) supports Layer 2 transparent mode and processes the traffic when the SRX Series device is configured in Layer 2 transparent mode.

When the SRX5K-MPC is operating in Layer 2 mode, you can configure all interfaces on the SRX5K-MPC as Layer 2 switching ports to support Layer 2 traffic.

The security processing unit (SPU) supports all security services for Layer 2 switching functions, and the MPC delivers the ingress packets to the SPU and forwards the egress packets that are encapsulated by the SPU to the outgoing interfaces.

When the SRX Series device is configured in Layer 2 transparent mode, you can enable the interfaces on the MPC to work in Layer 2 mode by defining one or more logical units on a physical interface with the family address type as **Ethernet switching**. Later you can proceed with configuring Layer 2 security zones and configuring security policies in transparent mode. Once this is done, next-hop topologies are set up to process ingress and egress packets.

Related Documentation

- Understanding VLANs on page 29
- Understanding Transparent Mode Conditions on page 27
- Understanding Layer 2 Interfaces on page 5
- Understanding Layer 2 Security Zones on page 35
- Understanding Security Policies in Transparent Mode on page 37

Understanding Transparent Mode Conditions

Supported Platforms SRX Series, vSRX

There is no command to define or enable transparent mode on the device. The device operates in transparent mode when there are interfaces defined as Layer 2 interfaces. The device operates in route mode (the default mode) if there are no physical interfaces configured as Layer 2 interfaces.

NOTE: Starting in Junos OS Release 12.3X48-D10, mixed mode is the default mode, abd you can configure an SRX Series device using both transparent mode (Layer 2) and route mode (Layer 3) simultaneously, with no reboot required.

You can configure the **fxp0** out-of-band management interface on the SRX Series device as a Layer 3 interface, even if Layer 2 interfaces are defined on the device. With the exception of the **fxp0** interface, you can define Layer 2 and Layer 3 interfaces on the device's network ports.

NOTE: There is no fxp0 out-of-band management interface on the SRX300, SRX320, SRX340, and SRX345 devices. (Platform support depends on the Junos OS release in your installation.)

Release History Table

Release	Description
12.3X48-D10	Starting in Junos OS Release 12.3X48-D10, mixed mode is the default mode, abd you can configure an SRX Series device using both transparent mode (Layer 2) and route mode (Layer 3) simultaneously, with no reboot required.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Example: Configuring Layer 2 Logical Interfaces on page 6
- Understanding Layer 2 Interfaces on page 5
- Understanding Mixed Mode (Layer 2 and Layer 3) on page 12

CHAPTER 4

Configuring VLANs in Transparent Mode

Understanding VLANs

Supported Platforms SRX Series, vSRX

The packets that are forwarded within a VLAN are determined by the VLAN ID of the packets and the VLAN ID of the VLAN. Only the packets with VLAN IDs that match the VLAN ID configured for a VLAN are forwarded within the VLAN.

When configuring VLANs, you can specify either a single VLAN ID or a list of specific VLAN IDs. If you specify a list of VLAN IDs, a VLAN is created for each VLAN ID in the list. Certain VLAN properties, such as the integrated routing and bridging interface (IRB), are not configurable if VLANs are created in this manner.

Each Layer 2 logical interface configured on the device is implicitly assigned to a VLAN based on the VLAN ID of the packets accepted by the interface. You do not need to explicitly define the logical interfaces when configuring a VLAN.

You can configure one or more static MAC addresses for a logical interface in a VLAN; this is only applicable if you specified a single VLAN ID when creating the VLAN.

NOTE: **If a static MAC address you configure for a logical interface appears on a different logical interface, packets sent to that interface are dropped.**

You can configure the following properties that apply to all VLANs on the SRX Series device:

- Layer 2 address learning—Layer 2 address learning is enabled by default. A VLAN learns unicast media access control (MAC) addresses to avoid flooding packets to all interfaces in the VLAN. Each VLAN creates a source MAC entry in its forwarding tables for each source MAC address learned from packets received on interfaces that belong to the VLAN. When you disable MAC learning, source MAC addresses are not

dynamically learned, and any packets sent to these source addresses are flooded into a VLAN.

- Maximum number of MAC addresses learned from all logical interfaces on the SRX Series device—After the MAC address limit is reached, the default is for any incoming packets with a new source MAC address to be forwarded. You can specify that the packets be dropped instead. The default limits of MAC addresses for the SRX Series devices are shown in Table 7 on page 30 and Table 8 on page 30. (Platform support depends on the Junos OS release in your installation.)

Table 7: MAC Addresses Default Limits for Junos OS Release 15.1X49-D30 and Earlier

SRX Series Devices	Default Limit for MAC Addresses
SRX100 SRX210	1024
SRX220	2048
SRX240	4096
SRX650	16,384
SRX3400 SRX3600 SRX5600 SRX5800	131,071

Starting in Junos OS Release 15.1X49-D40, default limits for MAC addresses are more uniform.

Table 8: MAC Addresses Default Limits for Junos OS Release Starting in Junos OS 15.1X49-D40

SRX Series Devices	Default Limit for MAC Addresses
SRX300 SRX320 SRX340 SRX345	16,383
SRX1500	24,575
SRX5600 SRX5800	131,071

- Timeout interval for MAC table entries. By default, the timeout interval for MAC table entries is 300 seconds. The minimum you can configure is 10 seconds and the maximum is 64,000 seconds. The timeout interval applies only to dynamically learned MAC addresses. This value does not apply to configured static MAC addresses, which never time out.

Release History Table

Release	Description
15.1X49-D40	Starting in Junos OS Release 15.1X49-D40, default limits for MAC addresses are more uniform.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Example: Configuring VLANs on page 31
- Understanding Integrated Routing and Bridging Interfaces on page 9
- Understanding Layer 2 Interfaces on page 5
- Understanding Layer 2 Forwarding Tables on page 43

Example: Configuring VLANs

Supported Platforms SRX Series, vSRX

This example shows how to configure VLANs.

NOTE: Starting in Junos OS Release 15.1X49-D10, new terminology and CLI keywords are used for switching functions. If your installation uses a Junos OS release preceding 15.1X49-D10, consult "Enhanced Layer 2 CLI Configuration Statement and Command Changes" on page 32 to determine how you must modify configuration tasks for implementation in earlier Junos OS environments.

- Requirements on page 31
- Overview on page 31
- Configuration on page 32
- Verification on page 32

Requirements

Before you begin, determine the properties you want to configure for the VLAN. See "Understanding VLANs" on page 29.

Overview

In this example, you configure VLAN vlan-a for VLANs 1 and 10, and VLAN vlan-b for VLAN 2. You then limit the number of MAC addresses learned on all logical interfaces on the

device to 64,000. When this limit is reached, incoming packets with a new source MAC address will be dropped.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set vlans vlan-a vlan members 1-10
set vlans vlan-b vlan-id 2
set protocols l2-learning global-mac-limit 64000 packet-action drop
```

Step-by-Step Procedure

To configure VLANs:

1. Configure the domain type and VLANs.

   ```
   [edit]
   user@host# set vlans vlan-a vlan members 1-10
   user@host# set vlans vlan-b vlan-id 2
   ```

2. Limit the number of MAC addresses.

   ```
   [edit]
   user@host# set protocols l2-learning global-mac-limit 64000 packet-action drop
   ```

3. If you are done configuring the device, commit the configuration.

   ```
   [edit]
   user@host# commit
   ```

Verification

To verify the configuration is working properly, enter the **show vlans** and **show protocols l2-learning** commands.

Release History Table

Release	Description
15.1X49-D10	Starting in Junos OS Release 15.1X49-D10, new terminology and CLI keywords are used for switching functions.

Related Documentation

- Understanding Integrated Routing and Bridging Interfaces on page 9
- Understanding Layer 2 Interfaces on page 5
- Understanding Layer 2 Forwarding Tables on page 43
- Understanding VLANs on page 29

Enhanced Layer 2 CLI Configuration Statement and Command Changes

Supported Platforms SRX Series

Starting in Junos OS Release 15.1X49-D10 some Layer 2 CLI configuration statements are enhanced, and some commands are changed. Table 9 on page 33 and Table 10 on page 34 provide lists of existing commands that have been moved to new hierarchies or changed on SRX Series devices as part of this CLI enhancement effort. The tables are provided as a high-level reference only. For detailed information about these commands, see CLI Explorer.

Table 9: Enhanced Layer 2 Configuration Statement Changes

Original Hierarchy	Changed Hierarchy	Hierarchy Level	Change Description

bridge-domains
  bridge-domain--name **{**
  ...
  }
}
	vlans *vlans-name* {
	  ...
	  }
	}
		[edit]	Hierarchy renamed.

bridge-domains
  bridge-domain--name {
  vlan-id-list [*vlan-id*] ;
}
	vlans *vlans-name* {
	  vlan members [*vlan-id*] ;
	}
		[edit vlans *vlans-name*]	Statement renamed.

bridge-options {
  interface *interface-name* {
  encapsulation-type;
  ~~ignore-encapsulation-mismatch;~~
  pseudowire-status-tlv;
  static-mac *mac-address* {
  vlan-id *vlan-id*;
  }
  }
  mac-table-aging-time
  seconds;
  mac-table-size {
  number;
  packet-action drop;
  }
}
	switch-options {
	  interface *interface-name* {
	  encapsulation-type;
	  ~~ignore-encapsulation-mismatch;~~
	  pseudowire-status-tlv;
	  static-mac *mac-address* {
	  vlan-id *vlan-id*;
	  }
	  }
	  mac-table-aging-time
	  seconds;
	  mac-table-size {
	  number;
	  packet-action drop;
	  }
	}
		[edit vlans *vlans-name*]	Statement renamed.

bridge {
  block-non-ip-all;
  bpdu-vlan-flooding;
  bypass-non-ip-unicast;
  no-packet-flooding {
  no-trace-route;
  }
}
	ethernet-switching {
	  block-non-ip-all;
	  bpdu-vlan-flooding;
	  bypass-non-ip-unicast;
	  no-packet-flooding {
	  no-trace-route;
	  }
	}
		[edit security flow]	Statement renamed.

family {
  bridge {
  bridge-domain-type (svlan|
  bvlan);
  ...
	family {
	  ethernet-switching {
	  ...
		[edit interfaces *interface-name*]
		unit *unit-number*
			Hierarchy renamed.

... **routing-interface** irb.0; ...	... **l3-interface** irb.0; ...	[edit vlans *vlans-name*]	Statement renamed.

Table 10: Enhanced Layer 2 Operational Command Changes

Original Operational Command	Modified Operational Command
clear bridge mac-table	clear ethernet-switching table
clear bridge mac-table persistent-learning	clear ethernet-switching table persistent-learning
show bridge domain	show vlans
show bridge mac-table	show ethernet-switching table
show l2-learning interface	show ethernet-switching interface

NOTE: There is no fxp0 out-of-band management interface on the SRX300, SRX320, and SRX500HM devices. (Platform support depends on the Junos OS release in your installation.)

Release History Table

Release	Description
15.1X49-D10	Starting in Junos OS Release 15.1X49-D10 some Layer 2 CLI configuration statements are enhanced, and some commands are changed.

CHAPTER 5

Configuring Security Zones and Security Policies

Understanding Layer 2 Security Zones

Supported Platforms SRX Series, vSRX

A Layer 2 security zone is a zone that hosts Layer 2 interfaces. A security zone can be either a Layer 2 or Layer 3 zone; it can host either all Layer 2 interfaces or all Layer 3 interfaces, but it cannot contain a mix of Layer 2 and Layer 3 interfaces.

The security zone type—Layer 2 or Layer 3—is implicitly set from the first interface configured for the security zone. Subsequent interfaces configured for the same security zone must be the same type as the first interface.

NOTE: **You cannot configure a device with both Layer 2 and Layer 3 security zones.**

You can configure the following properties for Layer 2 security zones:

- Interfaces—List of interfaces in the zone.
- Policies—Active security policies that enforce rules for the transit traffic, in terms of what traffic can pass through the firewall, and the actions that need to take place on the traffic as it passes through the firewall.
- Screens—A Juniper Networks stateful firewall secures a network by inspecting, and then allowing or denying, all connection attempts that require passage from one security zone to another. For every security zone, and the MGT zone, you can enable a set of predefined screen options that detect and block various kinds of traffic that the device determines as potentially harmful.

NOTE: You can configure the same screen options for a Layer 2 security zone as for a Layer 3 security zone.

- Address books—IP addresses and address sets that make up an address book to identify its members so that you can apply policies to them.
- TCP-RST—When this feature is enabled, the system sends a TCP segment with the reset flag set when traffic arrives that does not match an existing session and does not have the synchronize flag set.

In addition, you can configure a Layer 2 zone for host-inbound traffic. This allows you to specify the kinds of traffic that can reach the device from systems that are directly connected to the interfaces in the zone. You must specify all expected host-inbound traffic because inbound traffic from devices directly connected to the device's interfaces is dropped by default.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Layer 2 Interfaces on page 5
- Understanding Transparent Mode Conditions on page 27
- Example: Configuring Layer 2 Security Zones on page 36
- Example: Configuring Layer 2 Logical Interfaces on page 6

Example: Configuring Layer 2 Security Zones

Supported Platforms SRX Series, vSRX

This example shows how to configure Layer 2 security zones.

Requirements

Before you begin, determine the properties you want to configure for the Layer 2 security zone. See "Understanding Layer 2 Security Zones" on page 35.

Overview

In this example, you configure security zone l2-zone1 to include a Layer 2 logical interface called ge-3/0/0.0 and security zone l2-zone2 to include a Layer 2 logical interface called ge-3/0/1.0. Then you configure l2-zone2 to allow all supported application services (such as SSH, Telnet, and SNMP) as host-inbound traffic.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set security-zone l2-zone1 interfaces ge-3/0/0.0
set security-zone l2-zone2 interfaces ge-3/0/1.0
set security-zone l2–zone2 host-inbound-traffic system-services all
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure Layer 2 security zones:

1. Create a Layer 2 security zone and assign interfaces to it.

   ```
   [edit security zones]
   user@host# set security-zone l2-zone1 interfaces ge-3/0/0.0
   user@host# set security-zone l2-zone2 interfaces ge-3/0/1.0
   ```

2. Configure one of the Layer 2 security zones.

   ```
   [edit security zones]
   user@host# set security-zone l2–zone2 host-inbound-traffic system-services all
   ```

3. If you are done configuring the device, commit the configuration.

   ```
   [edit]
   user@host# commit
   ```

Verification

To verify the configuration is working properly, enter the **show security zones** command.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Example: Configuring Security Policies in Transparent Mode on page 38
- Example: Configuring Layer 2 Logical Interfaces on page 6

Understanding Security Policies in Transparent Mode

Supported Platforms SRX Series, vSRX

In transparent mode, security policies can be configured only between Layer 2 zones. When packets are forwarded through the VLAN, the security policies are applied between security zones. A security policy for transparent mode is similar to a policy configured for Layer 3 zones, with the following exceptions:

- NAT is not supported.

- IPsec VPN is not supported.
- Application ANY is used.

Layer 2 forwarding does not permit any interzone traffic unless there is a policy explicitly configured on the device. By default, Layer 2 forwarding performs the following actions:

- Allows or denies traffic specified by the configured policy.
- Allows Address Resolution Protocol (ARP) and Layer 2 non-IP multicast and broadcast traffic.
- Continues to block all non-IP and non-ARP unicast traffic.

This default behavior can be changed for Ethernet switching packet flow by using either J-Web or the CLI configuration editor:

- Configure the **block-non-ip-all** option to block all Layer 2 non-IP and non-ARP traffic, including multicast and broadcast traffic.
- Configure the **bypass-non-ip-unicast** option to allow all Layer 2 non-IP traffic to pass through the device.

NOTE: **You cannot configure both options at the same time.**

In mixed mode (default mode), you can create a separate security zone for Layer 2 and Layer 3 interfaces. However, there is no routing among IRB interfaces and between IRB interfaces and Layer 3 interfaces. Hence, you cannot configure security policies between Layer 2 and Layer 3 zones. You can only configure security policies between the Layer 2 zones or between Layer 3 zones.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Transparent Mode Conditions on page 27
- Example: Configuring Security Policies in Transparent Mode on page 38
- Example: Configuring Layer 2 Security Zones on page 36
- Understanding Mixed Mode (Layer 2 and Layer 3) on page 12

Example: Configuring Security Policies in Transparent Mode

Supported Platforms SRX Series, vSRX

This example shows how to configure security policies in transparent mode between Layer 2 zones.

- Requirements on page 39
- Overview on page 39
- Configuration on page 39
- Verification on page 40

Requirements

Before you begin, determine the policy behavior you want to include in the Layer 2 security zone. See "Understanding Security Policies in Transparent Mode" on page 37.

Overview

In this example, you configure a security policy to allow HTTP traffic from the 192.0.2.0/24 subnetwork in the l2–zone1 security zone to the server at 192.0.2.1/24 in the l2–zone2 security zone.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set security policies from-zone l2-zone1 to-zone l2-zone2 policy p1 match source-address
  192.0.2.0/24
set security policies from-zone l2-zone1 to-zone l2-zone2 policy p1 match
  destination-address 192.0.2.1/24
set security policies from-zone l2-zone1 to-zone l2-zone2 policy p1 match application http
set security policies from-zone l2-zone1 to-zone l2-zone2 policy p1 then permit
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure security policies in transparent mode:

1. Create policies and assign addresses to the interfaces for the zones.

   ```
   [edit security policies]
   user@host# set from-zone l2-zone1 to-zone l2-zone2 policy p1 match source-address
     192.0.2.0/24
   user@host# set from-zone l2-zone1 to-zone l2-zone2 policy p1 match
     destination-address 192.0.2.1/24
   ```

2. Set policies for the application.

   ```
   [edit security policies]
   user@host# set from-zone l2-zone1 to-zone l2-zone2 policy p1 match application
     http
   user@host# set from-zone l2-zone1 to-zone l2-zone2 policy p1 then permit
   ```

Results

From configuration mode, confirm your configuration by entering the **show security policies** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
  user@host> show security policies
  from-zone l2-zone1 to-zone l2-zone2
{
  policy p1 {
```

```
        match {
        source-address 192.0.2.0/24;
        destination-address 192.0.2.1/24;
        application junos-http;
      }
      then {
        permit;
      }
    }
  }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

To confirm that the configuration is working properly, perform these tasks:

Verifying Layer 2 Security Policies

Purpose Verify that the Layer 2 security policies are configured properly.

Action From configuration mode, enter the **show security policies** command.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Transparent Mode Conditions on page 27
- Example: Configuring Layer 2 Security Zones on page 36

Understanding Firewall User Authentication in Transparent Mode

Supported Platforms SRX Series

A firewall user is a network user who must provide a username and password for authentication when initiating a connection across the firewall. Firewall user authentication enables administrators to restrict and permit users accessing protected resources behind a firewall based on their source IP address and other credentials. Junos OS supports the following types of firewall user authentication for transparent mode on the SRX Series device:

- Pass-through authentication—A host or a user from one zone tries to access resources on another zone. You must use an FTP, Telnet, or HTTP client to access the IP address of the protected resource and be authenticated by the firewall. The device uses FTP, Telnet, or HTTP to collect username and password information, and subsequent traffic from the user or host is allowed or denied based on the result of this authentication.
- Web authentication—Users try to connect, by using HTTP, to an IP address on the IRB interface that is enabled for Web authentication. You are prompted for the username and password that are verified by the device. Subsequent traffic from the user or host to the protected resource is allowed or denied based on the result of this authentication.

Related Documentation

- *Authentication and Integrated User Firewalls Feature Guide for Security Devices*
- Layer 2 Transparent Mode Overview on page 25
- Understanding Integrated Routing and Bridging Interfaces on page 9
- Example: Configuring an IRB Interface on page 10

CHAPTER 6

Configuring Layer 2 Forwarding Tables

Understanding Layer 2 Forwarding Tables

Supported Platforms SRX Series, vSRX

The SRX Series device maintains forwarding tables that contain MAC addresses and associated interfaces for each Layer 2 VLAN. When a packet arrives with a new source MAC address in its frame header, the device adds the MAC address to its forwarding table and tracks the interface at which the packet arrived. The table also contains the corresponding interface through which the device can forward traffic for a particular MAC address.

If the destination MAC address of a packet is unknown to the device (that is, the destination MAC address in the packet does not have an entry in the forwarding table), the device duplicates the packet and floods it on all interfaces in the VLAN other than the interface on which the packet arrived. This is known as *packet flooding* and is the default behavior for the device to determine the outgoing interface for an unknown destination MAC address. Packet flooding is performed at two levels: packets are flooded to different zones as permitted by configured Layer 2 security policies, and packets are also flooded to different interfaces with the same VLAN identifier within the same zone. The device learns the forwarding interface for the MAC address when a reply with that MAC address arrives at one of its interfaces.

You can specify that the SRX Series device use ARP queries and traceroute requests (which are ICMP echo requests with the time-to-live values set to 1) instead of packet flooding to locate an unknown destination MAC address. This method is considered more secure than packet flooding because the device floods ARP queries and traceroute packets—not the initial packet—on all interfaces. When ARP or traceroute flooding is used, the original packet is dropped. The device broadcasts an ARP or ICMP query to all other devices on the same subnetwork, requesting the device at the specified destination IP address to send back a reply. Only the device with the specified IP address replies, which provides the requestor with the MAC address of the responder.

ARP allows the device to discover the destination MAC address for a unicast packet if the destination IP address is in the same subnetwork as the ingress IP address. (The ingress IP address refers to the IP address of the last device to send the packet to the

device. The device might be the source that sent the packet or a router forwarding the packet.) Traceroute allows the device to discover the destination MAC address even if the destination IP address belongs to a device in a subnetwork beyond that of the ingress IP address.

When you enable ARP queries to locate an unknown destination MAC address, traceroute requests are also enabled. You can also optionally specify that traceroute requests not be used; however, the device can then discover destination MAC addresses for unicast packets only if the destination IP address is in the same subnetwork as the ingress IP address.

Whether you enable ARP queries and traceroute requests or ARP-only queries to locate unknown destination MAC addresses, the SRX Series device performs the following series of actions:

1. The device notes the destination MAC address in the initial packet. The device adds the source MAC address and its corresponding interface to its forwarding table, if they are not already there.
2. The device drops the initial packet.
3. The device generates an ARP query packet and optionally a traceroute packet and floods those packets out all interfaces except the interface on which the initial packet arrived.

   ARP packets are sent out with the following field values:

   - Source IP address set to the IP address of the IRB
   - Destination IP address set to the destination IP address of the original packet
   - Source MAC address set to the MAC address of the IRB
   - Destination MAC address set to the broadcast MAC address (all **0xf**)

   Traceroute (ICMP echo request or ping) packets are sent out with the following field values:

   - Source IP address set to the IP address of the original packet
   - Destination IP address set to the destination IP address of the original packet
   - Source MAC address set to the source MAC address of the original packet
   - Destination MAC address set to the destination MAC address of the original packet
   - Time-to-live (TTL) set to **1**
4. Combining the destination MAC address from the initial packet with the interface leading to that MAC address, the device adds a new entry to its forwarding table.
5. The device forwards all subsequent packets it receives for the destination MAC address out the correct interface to the destination.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Integrated Routing and Bridging Interfaces on page 9

Example: Configuring the Default Learning for Unknown MAC Addresses

Supported Platforms SRX Series

This example shows how to configure the device to use only ARP requests to learn the outgoing interfaces for unknown destination MAC addresses.

Requirements

Before you begin, determine the MAC addresses and associated interfaces of the forwarding table. See "Understanding Layer 2 Forwarding Tables" on page 43.

Overview

In this example, you configure the device to use only ARP queries without traceroute requests.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set security flow ethernet-switching no-packet-flooding no-trace-route
```

Step-by-Step Procedure

To configure the device to use only ARP requests to learn unknown destination MAC addresses:

1. Enable the device.

   ```
   [edit]
   user@host# set security flow ethernet-switching no-packet-flooding no-trace-route
   ```

2. If you are done configuring the device, commit the configuration.

   ```
   [edit]
   user@host# commit
   ```

Verification

To verify the configuration is working properly, enter the **show security flow** command.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Integrated Routing and Bridging Interfaces on page 9
- Example: Configuring an IRB Interface on page 10

CHAPTER 7

Configuring Layer 2 Transparent Mode Chassis Clusters

Understanding Layer 2 Transparent Mode Chassis Clusters

Supported Platforms SRX Series, vSRX

A pair of SRX Series devices in Layer 2 transparent mode can be connected in a chassis cluster to provide network node redundancy. When configured in a chassis cluster, one node acts as the primary device and the other as the secondary device, ensuring stateful failover of processes and services in the event of system or hardware failure. If the primary device fails, the secondary device takes over processing of traffic.

NOTE: If the primary device fails in a Layer 2 transparent mode chassis cluster, the physical ports in the failed device become inactive (go down) for a few seconds before they become active (come up) again.

To form a chassis cluster, a pair of the same kind of supported SRX Series devices combines to act as a single system that enforces the same overall security.

Devices in Layer 2 transparent mode can be deployed in active/backup and active/active chassis cluster configurations.

The following chassis cluster features are not supported for devices in Layer 2 transparent mode:

- Gratuitous ARP—The newly elected master in a redundancy group cannot send gratuitous ARP requests to notify network devices of a change in mastership on the redundant Ethernet interface links.
- IP address monitoring—Failure of an upstream device cannot be detected.

A redundancy group is a construct that includes a collection of objects on both nodes. A redundancy group is primary on one node and backup on the other. When a redundancy

group is primary on a node, its objects on that node are active. When a redundancy group fails over, all its objects fail over together.

You can create one or more redundancy groups numbered 1 through 128 for an active/active chassis cluster configuration. Each redundancy group contains one or more redundant Ethernet interfaces. A redundant Ethernet interface is a pseudointerface that contains physical interfaces from each node of the cluster. The physical interfaces in a redundant Ethernet interface must be the same kind—either Fast Ethernet or Gigabit Ethernet. If a redundancy group is active on node 0, then the child links of all associated redundant Ethernet interfaces on node 0 are active. If the redundancy group fails over to the node 1, then the child links of all redundant Ethernet interfaces on node 1 become active.

NOTE: In the active/active chassis cluster configuration, the maximum number of redundancy groups is equal to the number of redundant Ethernet interfaces that you configure. In the active/backup chassis cluster configuration, the maximum number of redundancy groups supported is two.

Configuring redundant Ethernet interfaces on a device in Layer 2 transparent mode is similar to configuring redundant Ethernet interfaces on a device in Layer 3 route mode, with the following difference: the redundant Ethernet interface on a device in Layer 2 transparent mode is configured as a Layer 2 logical interface.

The redundant Ethernet interface may be configured as either an access interface (with a single VLAN ID assigned to untagged packets received on the interface) or as a trunk interface (with a list of VLAN IDs accepted on the interface and, optionally, a native-vlan-id for untagged packets received on the interface). Physical interfaces (one from each node in the chassis cluster) are bound as child interfaces to the parent redundant Ethernet interface.

In Layer 2 transparent mode, MAC learning is based on the redundant Ethernet interface. The MAC table is synchronized across redundant Ethernet interfaces and Services Processing Units (SPUs) between the pair of chassis cluster devices.

The IRB interface is used only for management traffic, and it cannot be assigned to any redundant Ethernet interface or redundancy group.

All Junos OS screen options that are available for a single, nonclustered device are available for devices in Layer 2 transparent mode chassis clusters.

NOTE: Spanning Tree Protocols (STPs) are not supported for Layer 2 transparent mode. You should ensure that there are no loop connections in the deployment topology.

Related Documentation

- *Chassis Cluster for Security Devices*
- Layer 2 Transparent Mode Overview on page 25

- Understanding Layer 2 Interfaces on page 5
- Example: Configuring Layer 2 Logical Interfaces on page 6
- Understanding Transparent Mode Conditions on page 27
- Example: Configuring Redundant Ethernet Interfaces for Layer 2 Transparent Mode Chassis Clusters on page 49
- Understanding Layer 2 Forwarding Tables on page 43

Example: Configuring Redundant Ethernet Interfaces for Layer 2 Transparent Mode Chassis Clusters

Supported Platforms SRX Series, vSRX

This example shows how to configure a redundant Ethernet interface on a device as a Layer 2 logical interface for a Layer 2 transparent mode chassis cluster.

- Requirements on page 49
- Overview on page 49
- Configuration on page 49
- Verification on page 50

Requirements

Before you begin, determine the devices you want to connect in a chassis cluster. See "Understanding Layer 2 Transparent Mode Chassis Clusters" on page 47.

Overview

This example shows you how to configure the redundant Ethernet interface as a Layer 2 logical interface and how to bind the physical interfaces (one from each node in the chassis cluster) to the redundant Ethernet interface. In this example, you create redundant Ethernet interface reth0 for redundancy group 1 and configure reth0 as an access interface with the VLAN identifier 1. Then you assign physical interface ge-2/0/2 on a chassis cluster node to the redundant Ethernet interface reth0.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set reth0 redundant-ether-options redundancy-group 1
set reth0 unit 0 family ethernet-switching interface-mode access vlan-id 1
set ge-2/0/2 gigether-options redundant-parent reth0
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a redundant Ethernet interface as a Layer 2 logical interface:

1. Configure the interfaces and redundancy group.

   ```
   [edit interfaces]
   user@host# set reth0 redundant-ether-options redundancy-group 1
   user@host# set reth0 unit 0 family ethernet-switching interface-mode access
     vlan-id 1
   ```

2. Assign a physical interface on a chassis cluster node.

   ```
   [edit interfaces]
   user@host# set ge-2/0/2 gigether-options redundant-parent reth0
   ```

3. If you are done configuring the device, commit the configuration.

   ```
   [edit]
   user@host# commit
   ```

Verification

To verify the configuration is working properly, enter the **show interfaces reth0** and **show interfaces ge-2/0/2** commands.

Related Documentation

- *Chassis Cluster for Security Devices*
- Layer 2 Transparent Mode Overview on page 25
- Understanding Transparent Mode Conditions on page 27
- Understanding Layer 2 Transparent Mode Chassis Clusters on page 47
- Understanding Layer 2 Forwarding Tables on page 43

CHAPTER 8

Configuring IP Spoofing in Layer 2 Transparent Mode

Understanding IP Spoofing in Layer 2 Transparent Mode

Supported Platforms SRX Series, vSRX

In an IP spoofing attack, the attacker gains access to a restricted area of the network and inserts a false source address in the packet header to make the packet appear to come from a trusted source. IP spoofing is most frequently used in denial-of-service (DoS) attacks. When SRX Series devices are operating in transparent mode, the IP spoof-checking mechanism makes use of address book entries. Address books only exist on the Routing Engine. IP spoofing in Layer 2 transparent mode is performed on the Packet Forwarding Engine. Address book information cannot be obtained from the Routing Engine each time a packet is received by the Packet Forwarding Engine. Therefore, address books attached to the Layer 2 zones must be pushed to the Packet Forwarding Engine.

NOTE: **IP spoofing in Layer 2 transparent mode does not support DNS and wildcard addresses.**

When a packet is received by the Packet Forwarding Engine, the packet's source IP address is checked to determine if it is in the incoming zone's address-book. If the packet's source IP address is in the incoming zone's address book, then this IP address is allowed on the interface, and traffic is passed.

If the source IP address is not present in the incoming zone's address-book, but exists in other zones', then the IP address is considered a spoofed IP. Accordingly, actions such as drop and logging can be taken depending on the screen configuration (alarm-without-drop).

NOTE: **If the alarm-without-drop option is configured, the Layer 2 spoofing packet only triggers an alarm message, but the packet is not dropped.**

If a packet's source IP address is not present in the incoming zone's address book or other zones', then you cannot determine if the IP is spoofed or not. In such instances, the packet is passed.

Junos OS takes into account the following match conditions while it searches for source IP addresses in the address book:

- **Host-match**—The IP address match found in the address-book is an address without a prefix.
- **Prefix-match**—The IP address match found in the address-book is an address with a prefix.
- **Any-match**—The IP address match found in the address-book is "any", "any-IPv4", or "any-IPv6".
- **No-match**—No IP address match is found.

Related Documentation

- Configuring IP Spoofing in Layer 2 Transparent Mode on page 52

Configuring IP Spoofing in Layer 2 Transparent Mode

Supported Platforms SRX Series, vSRX

You can configure the IP spoof-checking mechanism to determine whether or not an IP is being spoofed.

To configure IP spoofing in Layer 2 transparent mode:

1. Set the interface in Layer 2 transparent mode.

   ```
   [edit]
   user@host# set interfaces ge-0/0/1 unit 0 family ethernet-switching
   ```

2. (Optional) Set the zone in Layer 2 transparent mode.

   ```
   [edit]
   user@host# set security zones security-zone untrust interfaces ge-0/0/1.0
   ```

3. Configure the address book.

   ```
   [edit]
   user@host# set security address-book my-book address myadd1 10.1.1.0/24
   user@host# set security address-book my-book address myadd2 10.1.2.0/24
   ```

4. Apply the address book to the zone.

   ```
   [edit]
   user@host# set security address-book my-book attach zone untrust
   ```

5. Configure screen IP spoofing.

   ```
   [edit]
   user@host# set security screen ids-option my-screen ip spoofing
   ```

6. Apply the screen to the zone.

   ```
   [edit]
   ```

```
user@host# set security zones security-zone untrust screen my-screen
```

7. (Optional) Configure the **alarm-without-drop** option.

```
[edit]
user@host# set security screen ids-option my-screen alarm-without-drop
```

NOTE: If the **alarm-without-drop** option is configured, the Layer 2 spoofing packet only triggers an alarm message, but the packet is not dropped.

Related Documentation

- Understanding IP Spoofing in Layer 2 Transparent Mode on page 51

CHAPTER 9

Configuring Class of Service in Transparent Mode

Class of Service Functions in Transparent Mode Overview

Supported Platforms SRX Series, vSRX

Devices operating in Layer 2 transparent mode support the following class-of-service (CoS) functions:

- IEEE 802.1p behavior aggregate (BA) classifiers to determine the forwarding treatment for packets entering the device

  NOTE: **Only IEEE 802.1p BA classifier types are supported on devices operating in transparent mode.**

- Rewrite rules to redefine IEEE 802.1 CoS values in outgoing packets

  NOTE: **Rewrite rules that redefine IP precedence CoS values and Differentiated Services Code Point (DSCP) CoS values are not supported on devices operating in transparent mode.**

- Shapers to apply rate limiting to an interface
- Schedulers that define the properties of an output queue

You configure BA classifiers and rewrite rules on transparent mode devices in the same way as on devices operating in Layer 3 mode. For transparent mode devices, however, you apply BA classifiers and rewrite rules only to logical interfaces configured with the **family ethernet-switching** configuration statement.

Related Documentation

- *Class of Service Feature Guide for Security Devices*
- Layer 2 Transparent Mode Overview on page 25
- Understanding Transparent Mode Conditions on page 27
- Understanding BA Traffic Classification on Transparent Mode Devices on page 56
- Example: Configuring BA Classifiers on Transparent Mode Devices on page 56

Understanding BA Traffic Classification on Transparent Mode Devices

Supported Platforms SRX Series, vSRX

A BA classifier checks the header information of an ingress packet. The resulting traffic classification consists of a forwarding class (FC) and packet loss priority (PLP). The FC and PLP associated with a packet specify the CoS behavior of a hop within the system. For example, a hop can place a packet into a priority queue according to its FC, and manage queues by checking the packet's PLP. Junos OS supports up to eight FCs and four PLPs.

NOTE: **MPLS EXP bit-based traffic classification is not supported.**

BA classification can be applied within one DiffServ domain. BA classification can also be applied between two domains, where each domain honors the CoS results generated by the other domain. Junos OS performs BA classification for a packet by examining its Layer 2 and Layer 3 CoS-related parameters. Those parameters include the following:

- Layer 2—IEEE 802.1p: User Priority
- Layer 3—IPv4 Precedence, IPv4 DSCP, IPv6 DSCP

On SRX Series devices in transparent mode, a BA classifier evaluates only Layer 2 parameters. On SRX Series devices in Layer 3 mode, a BA classifier can evaluate Layer 2 and Layer 3 parameters; in that case, classification resulting from Layer 3 parameters overrides that of Layer 2 parameters.

On SRX Series devices in transparent mode, you specify one of four PLP levels—high, medium-high, medium-low, or low—when configuring a BA classifier.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Transparent Mode Conditions on page 27
- Class of Service Functions in Transparent Mode Overview on page 55
- Example: Configuring BA Classifiers on Transparent Mode Devices on page 56

Example: Configuring BA Classifiers on Transparent Mode Devices

Supported Platforms SRX Series

This example shows how to configure BA classifiers on transparent mode devices to determine the forwarding treatment of packets entering the devices.

Requirements

Before you begin, configure a Layer 2 logical interface. See "Example: Configuring Layer 2 Logical Interfaces" on page 6.

Overview

In this example, you configure logical interface ge-0/0/4.0 as a trunk port that carries traffic for packets tagged with VLAN identifiers 200 through 390. You then configure forwarding classes and create BA classifier c1 for IEEE 802.1 traffic where incoming packets with IEEE 802.1p priority bits 110 are assigned to the forwarding class fc1 with a low loss priority. Finally, you apply the BA classifier c1 to interface ge-0/0/4.0.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set interfaces ge-0/0/4 vlan-tagging unit 0 family ethernet-switching interface-mode
  trunk vlan members 200-390
set class-of-service forwarding-classes queue 0 fc1
set class-of-service forwarding-classes queue 1 fc2
set class-of-service forwarding-classes queue 3 fc4
set class-of-service forwarding-classes queue 4 fc5
set class-of-service forwarding-classes queue 5 fc6
set class-of-service forwarding-classes queue 6 fc7
set class-of-service forwarding-classes queue 7 fc8
set class-of-service forwarding-classes queue 2 fc3
set class-of-service classifiers ieee-802.1 c1 forwarding-class fc1 loss-priority low
  code-point 110
set class-of-service interfaces ge-0/0/4 unit 0 classifiers ieee-802.1 c1
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure BA classifiers on transparent mode devices:

1. Configure the logical interface as a Layer 2 trunk port.

```
[edit]
user@host# set interfaces ge-0/0/4 vlan-tagging unit 0 family ethernet-switching
  interface-mode trunk vlan members 200-390
```

2. Configure the class of service.

```
[edit]
user@host# edit class-of-service
```

3. Configure the forwarding classes.

```
[edit class-of-service]
user@host# set forwarding-classes queue 0 fc1
user@host# set forwarding-classes queue 1 fc2
user@host# set forwarding-classes queue 3 fc4
user@host# set forwarding-classes queue 4 fc5
user@host# set forwarding-classes queue 5 fc6
user@host# set forwarding-classes queue 6 fc7
user@host# set forwarding-classes queue 7 fc8
user@host# set forwarding-classes queue 2 fc3
```

4. Configure a BA classifier.

```
[edit class-of-service]
user@host# set classifiers ieee-802.1 c1 forwarding-class fc1 loss-priority low
  code-points 110
```

5. Apply the BA classifier to the interface.

```
[edit class-of-service]
user@host# set interfaces ge-0/0/4 unit 0 classifiers ieee-802.1 c1
```

Results From configuration mode, confirm your configuration by entering the **show interfaces ge-0/0/4** and **show class-of-service** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
  user@host> show interfaces ge-0/0/4
  vlan-tagging;
  unit 0 {
    family ethernet-switching {
    interface-mode trunk;
    vlan members 200-390;
  }
}
[edit]
  user@host> show class-of-service
  classifiers {
  ieee-802.1 c1 {
    forwarding-class fc1 {
    loss-priority low code-points 110;
    }
  }
  }
  forwarding-classes {
    queue 0 fc1;
    queue 1 fc2;
    queue 3 fc4;
    queue 4 fc5;
    queue 5 fc6;
```



```
        queue 6 fc7;
        queue 7 fc8;
        queue 2 fc3;
        }
        interfaces {
          ge-0/0/4 {
        unit 0 {
        classifiers {
          ieee-802.1 c1;
        }
        }
      }
    }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

To confirm that the configuration is working properly, perform this task:

Verifying BA Classifiers on Transparent Mode Devices

Purpose Verify that the BA classifier was configured on the transparent mode devices properly.

Action From configuration mode, enter the **show interfaces ge-0/0/4** and **show class-of-service** commands.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Transparent Mode Conditions on page 27
- Class of Service Functions in Transparent Mode Overview on page 55
- Understanding BA Traffic Classification on Transparent Mode Devices on page 56

Understanding Rewrite of Packet Headers on Transparent Mode Devices

Supported Platforms SRX Series, vSRX

Before a packet is transmitted from an interface, the CoS fields in the packet's header can be rewritten for the forwarding class (FC) and packet loss priority (PLP) of the packet. The rewriting function converts a packet's FC and PLP into corresponding CoS fields in the packet header. In Layer 2 transparent mode, the CoS fields are the IEEE 802.1p priority bits.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Transparent Mode Conditions on page 27
- Example: Configuring Rewrite Rules on Transparent Mode Devices on page 60

Example: Configuring Rewrite Rules on Transparent Mode Devices

Supported Platforms SRX Series, vSRX

This example shows how to configure rewrite rules on transparent mode devices to redefine IEEE 802.1 CoS values in outgoing packets.

Requirements

Before you begin, configure a Layer 2 logical interface. See "Example: Configuring Layer 2 Logical Interfaces" on page 6.

Overview

In this example, you configure logical interface ge-1/0/3.0 as a trunk port that carries traffic for packets tagged with VLAN identifiers 200 through 390. You then configure the forwarding classes and create rewrite rule rw1 for IEEE 802.1 traffic. For outgoing packets in the forwarding class fc1 with low loss priority, the IEEE 802.1p priority bits are rewritten as 011. Finally, you apply the rewrite rule rw1 to interface ge-1/0/3.0.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set interfaces ge-1/0/3 vlan-tagging unit 0 family ethernet-switching interface-mode
    trunk vlan members 200-390
set class-of-service forwarding-classes queue 0 fc1
set class-of-service forwarding-classes queue 1 fc2
set class-of-service forwarding-classes queue 3 fc4
set class-of-service forwarding-classes queue 4 fc5
set class-of-service forwarding-classes queue 5 fc6
set class-of-service forwarding-classes queue 6 fc7
set class-of-service forwarding-classes queue 7 fc8
set class-of-service forwarding-classes queue 2 fc3
set class-of-service rewrite-rules ieee-802.1 rw1 forwarding-class fc1 loss-priority low
    code-point 011
set class-of-service interfaces ge-1/0/3 unit 0 rewrite-rules ieee-802.1 rw1
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure rewrite rules on transparent mode devices:

1. Configure the logical interface as a Layer 2 trunk port.

```
[edit]
user@host# set interfaces ge-1/0/3 vlan-tagging unit 0 family ethernet-switching
  interface-mode trunk vlan members 200-390
```

2. Configure the class of service.

```
[edit]
user@host# edit class-of-service
```

3. Configure the forwarding classes.

```
[edit class-of-service]
user@host# set forwarding-classes queue 0 fc1
user@host# set forwarding-classes queue 1 fc2
user@host# set forwarding-classes queue 3 fc4
user@host# set forwarding-classes queue 4 fc5
user@host# set forwarding-classes queue 5 fc6
user@host# set forwarding-classes queue 6 fc7
user@host# set forwarding-classes queue 7 fc8
user@host# set forwarding-classes queue 2 fc3
```

4. Configure a rewrite rule.

```
[edit class-of-service]
user@host# set rewrite-rules ieee-802.1 rw1 forwarding-class fc1 loss-priority low
  code-point 011
```

5. Apply the rewrite rule to the interface.

```
[edit class-of-service]
user@host# set interfaces ge-1/0/3 unit 0 rewrite-rules ieee-802.1 rw1
```

Results

From configuration mode, confirm your configuration by entering the **show interfaces ge-1/0/3** and **show class-of-service** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
  user@host> show interfaces ge-1/0/3
  vlan-tagging;
  unit 0 {
    family ethernet-switching {
    interface-mode trunk;
    vlan members 200-390;
  }
}
[edit]
  user@host> show class-of-service
  forwarding-classes {
  queue 0 fc1;
    queue 1 fc2;
```

```
    queue 3 fc4;
    queue 4 fc5;
    queue 5 fc6;
    queue 6 fc7;
    queue 7 fc8;
  queue 2 fc3;
  }
  interfaces {
    ge-1/0/3 {
    unit 0 {
    rewrite-rules {
      ieee-802.1 rw1;
      }
    }
  }
  }
  rewrite-rules {
    ieee-802.1 rw1 {
    forwarding-class fc1 {
    loss-priority low code-point 011;
    }
  }
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

To confirm that the configuration is working properly, perform this task:

Verifying Rewrite Rules on Transparent Mode Devices

Purpose Verify that the rewrite rule was configured on the transparent mode devices properly.

Action From configuration mode, enter the **show interfaces ge-1/0/3** and **show class-of-service** commands.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25
- Understanding Transparent Mode Conditions on page 27
- Understanding Rewrite of Packet Headers on Transparent Mode Devices on page 59

CHAPTER 10

Configuring IPv6 Flows

Understanding IPv6 Flows in Transparent Mode

Supported Platforms SRX Series

In transparent mode, the SRX Series device filters packets that traverse the device without modifying any of the source or destination information in the packet MAC headers. Transparent mode is useful for protecting servers that mainly receive traffic from untrusted sources because there is no need to reconfigure the IP settings of routers or protected servers.

A device operates in transparent mode when all physical interfaces on the device are configured as Layer 2 interfaces. A physical interface is a Layer 2 interface if its logical interface is configured with the **ethernet-switching** option at the [**edit interfaces** ***interface-name*** **unit** ***unit-number*** **family**] hierarchy level. There is no command to define or enable transparent mode on the device. The device operates in transparent mode when there are interfaces defined as Layer 2 interfaces. The device operates in route mode (the default mode) if all physical interfaces are configured as Layer 3 interfaces.

By default, IPv6 flows are dropped on security devices. To enable processing by security features such as zones, screens, and firewall policies, you must enable flow-based forwarding for IPv6 traffic with the **mode flow-based** configuration option at the [**edit security forwarding-options family inet6**] hierarchy level. You must reboot the device when you change the mode.

In transparent mode, you can configure Layer 2 zones to host Layer 2 interfaces, and you can define security policies between Layer 2 zones. When packets travel between Layer 2 zones, security policies can be enforced on these packets. The following security features are supported for IPv6 traffic in transparent mode:

- Layer 2 security zones and security policies. See "Understanding Layer 2 Security Zones" on page 35 and "Understanding Security Policies in Transparent Mode" on page 37.
- Firewall user authentication. See "Understanding Firewall User Authentication in Transparent Mode" on page 40.

- Layer 2 transparent mode chassis clusters. See "Understanding Layer 2 Transparent Mode Chassis Clusters" on page 47.
- Class of service functions. See "Class of Service Functions in Transparent Mode Overview" on page 55.

The following security features are *not* supported for IPv6 flows in transparent mode:

- Logical systems
- IPv6 GTPv2
- J-Web interface
- NAT
- IPsec VPN
- With the exception of DNS, FTP, and TFTP ALGs, all other ALGs are not supported.

Configuring VLANs and Layer 2 logical interfaces for IPv6 flows is the same as configuring VLANs and Layer 2 logical interfaces for IPv4 flows. You can optionally configure an integrated routing and bridging (IRB) interface for management traffic in a VLAN. The IRB interface is the only Layer 3 interface allowed in transparent mode. The IRB interface on the SRX Series device does not support traffic forwarding or routing. The IRB interface can be configured with both IPv4 and IPv6 addresses. You can assign an IPv6 address for the IRB interface with the **address** configuration statement at the [**edit interfaces irb unit *number* family inet6**] hierarchy level. You can assign an IPv4 address for the IRB interface with the **address** configuration statement at the [**edit interfaces irb unit *number* family inet**] hierarchy level.

The Ethernet Switching functions on SRX Series devices are similar to the switching features on Juniper Networks MX Series routers. However, not all Layer 2 networking features supported on MX Series routers are supported on SRX Series devices. See "Layer 2 Transparent Mode Overview" on page 25.

The SRX Series device maintains forwarding tables that contain MAC addresses and associated interfaces for each Layer 2 VLAN. The IPv6 flow processing is similar to IPv4 flows. See "Understanding Layer 2 Forwarding Tables" on page 43.

Related Documentation

- Flow-Based Processing for IPv6 Traffic on page 64
- Example: Configuring Transparent Mode for IPv6 Flows on page 66

Flow-Based Processing for IPv6 Traffic

Flow-based processing mode is required for security features such as zones, screens, and firewall policies to function. Starting with Junos OS Release 15.1X49-D70, the SRX Series device is enabled for flow-based forwarding for IPv6 traffic on all devices except the SRX300 Series device.

You do not need to reboot the SRX Series device for flow-based forwarding for IPv6 traffic to take effect on the following devices, the default is assumed. Also, when IPv6

is configured on these devices, you do not need to reboot the SRX Series device after switching modes between packet mode, flow mode, and drop mode.

- SRX1500
- SRX4100, SRX4200
- SRX5600, SRX5800
- vSRX

SRX300 Series Devices

When IPv6 is configured on SRX300 Series devices, drop mode remains the default behavior because of memory constraints. In this case, you must reboot the device after changing the processing mode from the drop mode default to flow mode and between modes on SRX300 Series devices.

To enable flow-based forwarding for IPv6 traffic on SRX300 Series devices, modify the mode statement at the [**edit security forwarding-options family inet6**] hierarchy level:

```
security {
  forwarding-options {
    family {
      inet6 {
        mode flow-based;
      }
    }
  }
}
```

To configure forwarding for IPv6 traffic on SRX300 Series devices:

1. Change the forwarding option mode for IPv6 to flow-based.

   ```
   [edit]
   user@host# security forwarding-options family inet6 mode flow-based
   ```

2. Review your configuration.

   ```
   [edit]
   user@host# show security forwarding-options
     family {
       inet6 {
         mode flow-based;
       }
     }
   ```

3. Check your changes to the configuration before committing.

   ```
   [edit]
   user@host# commit check


   warning: You have enabled/disabled inet6 flow.
   You must reboot the system for your change to take effect.
   If you have deployed a cluster, be sure to reboot all nodes.
   configuration check succeeds
   ```

4. Commit the configuration.

```
[edit]
user@host# commit

warning: You have enabled/disabled inet6 flow.
You must reboot the system for your change to take effect.
If you have deployed a cluster, be sure to reboot all nodes.
commit complete
```

5. Reboot the device.

NOTE: For SRX300 Series, the device discards IPv6 type 0 Routing Header (RH0) packets.

To process IPv6 traffic on SRX300 Series devices, you need to configure IPv6 addresses for the transit interfaces that receive and forward the traffic. For information on the inet6 protocol family and procedures for configuring IPv6 addresses for interfaces, see the *Interfaces Feature Guide for Security Devices*. To process IPv6 traffic, you also need to configure IPv6 addresses for the transit interfaces that receive and forward the traffic. For information on the inet6 protocol family and procedures for configuring IPv6 addresses for interfaces, see the Interfaces Feature Guide for Security Devices.

Release History Table

Release	Description
15.1X49-D70	Starting with Junos OS Release 15.1X49-D70, the SRX Series device is enabled for flow-based forwarding for IPv6 traffic on all devices except the SRX300 Series device.

Related Documentation

- *Understanding IPv6 Address Space, Addressing, Address Format, and Address Types*
- *Using Filters to Display IPv6 Session and Flow Information for SRX Series Services Gateways*

Example: Configuring Transparent Mode for IPv6 Flows

Supported Platforms SRX Series

This example shows how to configure VLANs, a Layer 2 interface, and an IRB interface that supports both IPv4 and IPv6 addresses. This example also shows how to configure the device to use only ARP requests to learn the outgoing interfaces for unknown destination MAC addresses.

Requirements

The device must be enabled for IPv6 flow processing. See "Flow-Based Processing for IPv6 Traffic" on page 64.

Overview

This example creates the configuration described in Table 11 on page 67.

Table 11: IPv6 Transparent Mode Configuration for IPv6 Flows

Feature	Name	Configuration Parameters
VLANs	vlan-a	VLAN 2
	vlan-b	VLAN 10
Logical interface	ge-0/0/0.0	Trunk port for packets tagged with VLAN IDs 1 through 10
Physical interface	ge-0/0/0	VLAN ID 30 assigned to untagged packets
IRB interface	irb.0	Addresses: • IPv4 address 10.1.1.1/24 • IPv6 address 2001:0db8:2::1/64 Referenced in vlan-b VLAN
Learn the outgoing interfaces for unknown destination MAC addresses		Use only ARP queries without traceroute requests

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set vlans vlan-a vlan-id 2
set vlans vlan-b vlan members 1-10
set interfaces ge-0/0/0 vlan-tagging native-vlan-id 30
set interfaces ge-0/0/0 unit 0 family ethernet-switching interface-mode trunk vlan
  members 1-10
set interfaces irb unit 0 family inet address 10.1.1.1/24
set interfaces irb unit 0 family inet6 address 2001:0db8::1/64
set vlans vlan-b l3-interface irb.0
set security flow ethernet-switching no-packet-flooding no-trace-route
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure transparent mode for IPv6 flows:

1. Configure VLANs.

```
[edit vlans]
user@host# set vlan-a vlan-id 2
user@host# set vlan-b vlan members 1-10
```

2. Configure the Layer 2 interface.

```
[edit interfaces ge-0/0/0]
user@host# set vlan-tagging native-vlan-id 30
user@host# set unit 0 family ethernet-switching interface-mode trunk vlan members
  1-10
```

3. Configure the IRB interface.

```
[edit interfaces irb unit 0]
user@host# set family inet address 10.1.1.1/24
user@host# set family inet6 address 2001:0db8::1/64
```

4. Configure the IRB interface for the VLAN.

```
[edit vlans]
user@host# set vlan-b l3-interface irb.0
```

5. Configure learning for unknown destination MAC addresses.

```
[edit security flow ethernet-switching]
user@host# set no-packet-flooding no-trace-route
```

Results

From configuration mode, confirm your configuration by entering the **show vlans**, **show interfaces**, and **show security flow ethernet-switching** commands. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
user@host# show vlans
vlan-a {
   vlan-id 2;
}
   vlan-b {
      vlan members 1-10;
      l3-interface irb.0;
   }
user@host# show interfaces
ge-0/0/0 {
   vlan-tagging;
   native-vlan-id 30;
   unit 0 {
      family ethernet-switching {
         interface-mode trunk;
         vlan members 1-10;
```

```
    }
  }
}
user@host# show security flow ethernet-switching
no-packet-flooding {
  no-trace-route;
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying IPv6 Sessions on page 69
- Verifying IPv6 Gates on page 69
- Verifying IPv6 IP-action Settings on page 69

Verifying IPv6 Sessions

Purpose Verify IPv6 sessions on the device.

Action From operational mode, enter the **show security flow session family inet6** command.

Verifying IPv6 Gates

Purpose Verify IPv6 gates on the device.

Action From operational mode, enter the **show security flow gate family inet6** command.

Verifying IPv6 IP-action Settings

Purpose Verify IPv6 IP-action settings on the device.

Action From operational mode, enter the **show security flow ip-action family inet6** command.

Related Documentation

- *Understanding IPv6 Address Space, Addressing, Address Format, and Address Types*
- Understanding IPv6 Flows in Transparent Mode on page 63

CHAPTER 11

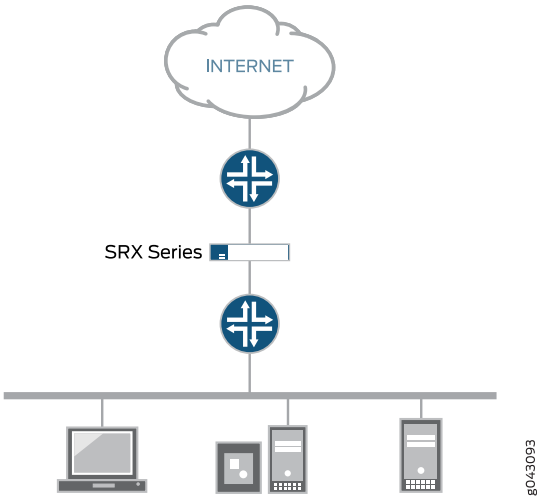
Configuring Secure Wire

Understanding Secure Wire

Supported Platforms SRX Series

Traffic that arrives on a specific interface can be forwarded unchanged through another interface. This mapping of interfaces, called secure wire, allows an SRX Series to be deployed in the path of network traffic without requiring a change to routing tables or a reconfiguration of neighboring devices. Figure 4 on page 72 shows a typical in-path deployment of an SRX Series with secure wire.

Figure 4: SRX Series In-Path Deployment with Secure Wire



Secure wire maps two peer interfaces. It differs from transparent and route modes in that there is no switching or routing lookup to forward traffic. As long as the traffic is permitted by a security policy, a packet arriving on one peer interface is immediately forwarded unchanged out of the other peer interface. There is no routing or switching decision made on the packet. Return traffic is also forwarded unchanged.

Secure wire mapping is configured with the **secure-wire** statement at the [**edit security forwarding-options**] hierarchy level; two Ethernet logical interfaces must be specified. The Ethernet logical interfaces must be configured with **family ethernet-switching** and each pair of interfaces must belong to the VLAN(s). The interfaces must be bound to security zones and a security policy configured to permit traffic between the zones.

This feature is available on Ethernet logical interfaces only; both IPv4 and IPv6 traffic are supported. You can configure interfaces for access or trunk mode. Secure wire supports chassis cluster redundant Ethernet interfaces. This feature does not support security features not supported in transparent mode, including NAT and IPsec VPN. Layer 7 features, including AppSecure, IPS, and UTM, are supported.

Secure wire is a special case of Layer 2 transparent mode on SRX Series devices that provide point-to-point connections. This means that the two interfaces of a secure wire should ideally be directly connected to Layer 3 entities, such as routers or hosts. Secure wire interfaces can be connected to switches. However, note that a secure wire interface forwards all arriving traffic to the peer interface only if the traffic is permitted by a security policy.

Secure wire can coexist with Layer 3 mode. While you can configure Layer 2 and Layer 3 interfaces at the same time, traffic forwarding occurs independently on Layer 2 and Layer 3 interfaces.

Secure wire can coexist with Layer 2 transparent mode. If both features exist on the same SRX Series device, you need to configure them in different VLANs.

NOTE: Integrated routing and bridging (IRB) interfaces are not supported with secure wire.

Related Documentation

- Example: Simplifying SRX Series Device Deployment with Secure Wire over Access Mode Interfaces on page 73
- Example: Simplifying SRX Series Device Deployment with Secure Wire over Trunk Mode Interfaces on page 76
- Example: Simplifying SRX Series Device Deployment with Secure Wire over Aggregated Interface Member Links on page 80
- Example: Simplifying Chassis Cluster Deployment with Secure Wire over Redundant Ethernet Interfaces on page 84
- Example: Simplifying Chassis Cluster Deployment with Secure Wire over Aggregated Redundant Ethernet Interfaces on page 88
- Understanding Mixed Mode (Layer 2 and Layer 3) on page 12

Example: Simplifying SRX Series Device Deployment with Secure Wire over Access Mode Interfaces

Supported Platforms SRX Series

If you are connecting an SRX Series device to other network devices, you can use secure wire to simplify the device deployment in the network. No changes to routing or forwarding tables on the SRX Series device and no reconfiguration of neighboring devices is needed. Secure wire allows traffic to be forwarded unchanged between specified access mode interfaces on an SRX Series device as long as it is permitted by security policies or other security features. Follow this example if you are connecting an SRX Series device to other network devices through access mode interfaces.

This example shows how to configure a secure wire mapping for two access mode interfaces. This configuration applies to scenarios where user traffic is not VLAN tagged.

Requirements

No special configuration beyond device initialization is required before configuring this feature.

Overview

This example configures the secure wire access-sw that maps interface ge-0/0/0.0 to interface ge-0/0/1.0. The two peer interfaces are configured for access mode. The VLAN ID 10 is configured for the vlan-10 and the access mode interfaces.

NOTE: A specific VLAN ID must be configured for a VLAN.

Topology

Figure 5 on page 74 shows the access mode interfaces that are mapped in secure wire access-sw.

Figure 5: Secure Wire Access Mode Interfaces

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set vlans vlan-10 vlan-id 10
set interfaces ge-0/0/0 unit 0 family ethernet-switching interface-mode access vlan-id
  10
set interfaces ge-0/0/1 unit 0 family ethernet-switching interface-mode access vlan-id
  10
set security forwarding-options secure-wire access-sw interface [ge-0/0/0.0 ge-0/0/1.0]
set security zones security-zone trust interfaces ge-0/0/0.0
set security zones security-zone untrust interfaces ge-0/0/1.0
set security policies default-policy permit-all
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a secure wire mapping for access mode interfaces:

1. Configure the VLAN.

   ```
   [edit vlans vlan-10]
   user@host# set vlan-id 10
   ```

2. Configure the access mode interfaces.

   ```
   [edit interfaces ]
   ```

```
user@host# set ge-0/0/0 unit 0 family ethernet-switching interface-mode access
  vlan-id 10
user@host# set ge-0/0/1 unit 0 family ethernet-switching interface-mode access
  vlan-id 10
```

3. Configure the secure wire mapping.

```
[edit security forwarding-options]
user@host# set secure-wire access-sw interface [ge-0/0/0.0 ge-0/0/1.0]
```

4. Configure security zones.

```
[edit security zones]
user@host# set security-zone trust interfaces ge-0/0/0.0
user@host# set security-zone untrust interfaces ge-0/0/1.0
```

5. Configure a security policy to permit traffic.

```
[edit security policies]
user@host# set default-policy permit-all
```

Results From configuration mode, confirm your configuration by entering the **show vlans**, **show interfaces**, **show security forwarding-options**, and **show security zones** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@host# show vlans
  vlan-10 {
    vlan-id 10;
    interface ge-0/0/0.0;
    interface ge-0/0/1.0;
  }
  user@host# show interfaces
  ge-0/0/0 {
    unit 0 {
      family ethernet-switching {
        interface-mode access;
        vlan {
          members vlan-10;
        }
      }
    }
  }
  ge-0/0/1 {
    unit 0 {
      family ethernet-switching {
        interface-mode access;
        vlan {
          members vlan-10;
        }
      }
    }
  }
  user@host# show security forwarding-options
  secure-wire {
    access-sw {
      interface [ ge-0/0/0.0 ge-0/0/1.0 ];
```

```
    }
  }
user@host# show security zones
  security-zone trust {
    interfaces {
      ge-0/0/0.0;
    }
  }
  security-zone untrust {
    interfaces {
      ge-0/0/1.0;
    }
  }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying Secure Wire Mapping on page 76
- Verifying the VLAN on page 76

Verifying Secure Wire Mapping

Purpose Verify the secure wire mapping.

Action From operational mode, enter the **show security forwarding-options secure-wire** command.

```
user@host> show security forward-options secure-wire
Secure wire                    Interface       Link   Interface       Link

access-sw                      ge-0/0/0.0      up     ge-0/0/1.0      up
Total secure wires: 1
```

Verifying the VLAN

Purpose Verify the VLAN.

Action From operational mode, enter the **show vlans vlan-10** command.

```
user@host> show vlans vlan-10
Routing instance        VLAN name            Tag     Interfaces
default-switch          vlan-10               10          ge-0/0/0.0
                                                          ge-0/0/1.0
```

Related Documentation

- Understanding Secure Wire on page 71

Example: Simplifying SRX Series Device Deployment with Secure Wire over Trunk Mode Interfaces

Supported Platforms SRX Series

If you are connecting an SRX Series device to other network devices, you can use secure wire to simplify the device deployment in the network. No changes to routing or forwarding tables on the SRX Series device and no reconfiguration of neighboring devices is needed. Secure wire allows traffic to be forwarded unchanged between specified trunk mode interfaces on an SRX Series device as long as it is permitted by security policies or other security features. Follow this example if you are connecting an SRX Series device to other network devices through trunk mode interfaces.

Requirements

No special configuration beyond device initialization is required before configuring this feature.

Overview

This example configures the secure wire trunk-sw that maps interface ge-0/1/0.0 to interface ge-0/1/1.0. The two peer interfaces are configured for trunk mode and carry user traffic tagged with VLAN IDs from 100 to 102. The VLAN ID list 100-102 is configured for the VLAN vlan-100 and the trunk mode interfaces.

NOTE: A specific VLAN ID must be configured for a VLAN.

Topology

Figure 6 on page 77 shows the trunk mode interfaces that are mapped in secure wire trunk-sw.

Figure 6: Secure Wire Trunk Mode Interfaces

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set vlans vlan-100 vlan members 100-102
set interfaces ge-0/1/0 unit 0 family ethernet-switching interface-mode trunk vlan
  members 100-102
```

```
set interfaces ge-0/1/1 unit 0 family ethernet-switching interface-mode trunk vlan
  members 100-102
set security forwarding-options secure-wire trunk-sw interface [ge-0/1/0.0 ge-0/1/1.0]
set security zones security-zone trust interfaces ge-0/1/0.0
set security zones security-zone untrust interfaces ge-0/1/1.0
set security policies default-policy permit-all
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a secure wire mapping for trunk mode interfaces:

1. Configure the VLAN.

   ```
   [edit vlans vlan-100]
   user@host# set vlan members 100-102
   ```

2. Configure the trunk mode interfaces.

   ```
   [edit interfaces]
   user@host# set ge-0/1/0 unit 0 family ethernet-switching interface-mode trunk
     vlan members 100-102
   user@host# set ge-0/1/1 unit 0 family ethernet-switching interface-mode trunk
     vlan members 100-102
   ```

3. Configure the secure wire mapping.

   ```
   [edit security forwarding-options]
   user@host# set secure-wire trunk-sw interface [ge-0/1/0.0 ge-0/1/1.0]
   ```

4. Configure security zones.

   ```
   [edit security zones]
   user@host# set security-zone trust interfaces ge-0/1/0.0
   user@host# set security-zone untrust interfaces ge-0/1/1.0
   ```

5. Configure a security policy to permit traffic.

   ```
   [edit security policies]
   user@host# set default-policy permit-all
   ```

Results

From configuration mode, confirm your configuration by entering the **show vlans**, **show interfaces**, **show security forwarding-options**, and **show security zones** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@host# show vlans
  vlan-100 {
    vlan members 100-102;
  }
  user@host# show interfaces
  ge-0/1/0 {
    unit 0 {
      family ethernet-switching {
        interface-mode trunk;
        vlan members 100-102;
      }
```

```
    }
  }
  ge-0/1/1 {
    unit 0 {
      family ethernet-switching {
        interface-mode trunk;
        vlan members 100-102;
      }
    }
  }
  user@host# show security forwarding-options
  secure-wire trunk-sw {
    interfaces [ge-0/1/0.0 ge-0/1/1.0];
  }
user@host# show security zones
  security-zone trust {
    interfaces {
      ge-0/1/0.0;
    }
  }
  security-zone untrust {
    interfaces {
      ge-0/1/1.0;
    }
  }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying Secure Wire Mapping on page 79
- Verifying the VLAN on page 79

Verifying Secure Wire Mapping

Purpose Verify the secure wire mapping.

Action From operational mode, enter the **show security forwarding-options secure-wire** command.

```
user@host> show security forward-options secure-wire
Secure wire                    Interface       Link   Interface       Link

trunk-sw                       ge-0/1/0.0      up     ge-0/1/1.0      up
Total secure wires: 1
```

Verifying the VLAN

Purpose Verify the VLAN.

Action From operational mode, enter the **show vlans** command.

```
user@host> show vlans
```

```
Routing instance        VLAN name             VLAN ID     Interfaces
default-switch          vlan-100-vlan-0100        100         ge-0/1/0.0
                                                            ge-0/1/1.0
default-switch          vlan-100-vlan-0101        101         ge-0/1/0.0
                                                            ge-0/1/1.0
default-switch          vlan-100-vlan-0102        102         ge-0/1/0.0
                                                            ge-0/1/1.0
```

NOTE: VLANs are automatically expanded, with one VLAN for each VLAN ID in the VLAN ID list.

Related Documentation

- Understanding Secure Wire on page 71

Example: Simplifying SRX Series Device Deployment with Secure Wire over Aggregated Interface Member Links

Supported Platforms SRX Series

If you are connecting an SRX Series device to other network devices, you can use secure wire to simplify the device deployment in the network. No changes to routing or forwarding tables on the SRX Series device and no reconfiguration of neighboring devices is needed. Secure wire allows traffic to be forwarded unchanged between specified aggregated interface member links on an SRX Series device as long as it is permitted by security policies or other security features. Follow this example if you are connecting an SRX Series device to other network devices through aggregated interface member links.

NOTE: LACP is not supported. Secure wire mappings can be configured for member links of link bundles instead of directly mapping aggregated Ethernet interfaces.

Requirements

No special configuration beyond device initialization is required before configuring this feature.

Overview

This example configures secure wires for two aggregated Ethernet interface link bundles with two links each. Two separate secure wires ae-link1 and ae-link2 are configured using one link from each aggregated Ethernet link bundle. This static mapping requires that the two link bundles have the same number of links.

For link bundles, all logical interfaces of the secure wire mappings must belong to the same VLAN. VLAN ID 10 is configured for the VLAN vlan-10 and the logical interfaces. All logical interfaces of a link bundle must belong to the same security zone.

NOTE: A specific VLAN ID or VLAN ID list must be configured for a VLAN.

Topology

Figure 7 on page 81 shows the aggregated interfaces that are mapped in secure wire configurations.

Figure 7: Secure Wire Aggregated Interfaces

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set vlans vlan-10 vlan-id 10
set interfaces ge-0/0/0 unit 0 family ethernet-switching interface-mode access vlan-id
  10
set interfaces ge-0/0/1 unit 0 family ethernet-switching interface-mode access vlan-id
  10
set interfaces ge-0/1/0 unit 0 family ethernet-switching interface-mode access vlan-id
  10
set interfaces ge-0/1/1 unit 0 family ethernet-switching interface-mode access vlan-id
  10
set security forwarding-options secure-wire ae-link1-sw interface [ge-0/1/0.0 ge-0/1/1.0]
set security forwarding-options secure-wire ae-link2-sw interface [ge-0/0/0.0 ge-0/0/1.0]
set security zones security-zone trust interfaces ge-0/0/0.0
set security zones security-zone trust interfaces ge-0/1/0.0
set security zones security-zone untrust interfaces ge-0/0/1.0
set security zones security-zone untrust interfaces ge-0/1/1.0
set security policies default-policy permit-all
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a secure wire mapping for aggregated interface member links:

1. Configure the VLAN.

   ```
   [edit vlans vlan-10]
   user@host# set vlan-id10
   ```

2. Configure the interfaces.

   ```
   [edit interfaces ]
   ```

```
user@host# set ge-0/0/0 unit 0 family ethernet-switching interface-mode access
  vlan-id 10
user@host# set ge-0/0/1 unit 0 family ethernet-switching interface-mode access
  vlan-id 10
user@host# set ge-0/1/0 unit 0 family ethernet-switching interface-mode access
  vlan-id 10
user@host# set ge-0/1/1 unit 0 family ethernet-switching interface-mode access
  vlan-id 10
```

3. Configure the secure wire mappings.

```
[edit security forwarding-options]
user@host# set secure-wire ae-link1-sw interface [ ge-0/1/0.0 ge-0/1/1.0 ]
user@host# set secure-wire ae-link2-sw interface [ ge-0/0/0.0 ge-0/0/1.0 ]
```

4. Configure security zones.

```
[edit security zones]
user@host# set security-zone trust interfaces ge-0/0/0.0
user@host# set security-zone trust interfaces ge-0/1/0.0
user@host# set security-zone untrust interfaces ge-0/0/1.0
user@host# set security-zone untrust interfaces ge-0/1/1.0
```

5. Configure a security policy to permit traffic.

```
[edit security policies]
user@host# set default-policy permit-all
```

Results From configuration mode, confirm your configuration by entering the **show vlans**, **show interfaces**, **show security forwarding-options**, and **show security zones** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@host# show vlans
  vlan-10 {
    vlan-id 10;
  }
  user@host# show interfaces
  ge-0/0/0 {
    unit 0 {
      family ethernet-switching {
        interface-mode access;
        vlan-id 10;
      }
    }
  }
  ge-0/0/1 {
    unit 0 {
      family ethernet-switching {
        interface-mode access;
        vlan-id 10;
      }
    }
  }
  ge-0/1/0 {
    unit 0 {
      family ethernet-switching {
```



```
            interface-mode access;
            vlan-id 10;
          }
        }
      }
      ge-0/1/1{
        unit 0 {
          family ethernet-switching {
            interface-mode access;
            vlan-id 10;
          }
        }
      }
      user@host# show security forwarding-options
      secure-wire ae-link1-sw {
        interfaces [ge-0/1/0.0 ge-0/1/1.0];
      }
      secure-wire ae-link2-sw {
        interfaces [ge-0/0/0.0 ge-0/0/1.0];
      }
    user@host# show security zones
      security-zone trust {
        interfaces {
          ge-0/0/0.0;
          ge-0/1/0.0;
        }
      }
      security-zone untrust {
        interfaces {
          ge-0/0/1.0;
          ge-0/1/1.0;
        }
      }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying Secure Wire Mapping on page 83
- Verifying the VLAN on page 84

Verifying Secure Wire Mapping

Purpose Verify the secure wire mapping.

Action From operational mode, enter the **show security forwarding-options secure-wire** command.

```
user@host> show security forward-options secure-wire
Secure wire                    Interface       Link   Interface       Link

ae-link1-sw                    ge-0/1/0.0      up     ge-0/1/1.0      up
ae-link2-sw                    ge-0/0/0.0      up     ge-0/0/1.0      up
Total secure wires: 2
```

Verifying the VLAN

Purpose Verify the VLAN.

Action From operational mode, enter the **show vlans vlan-10** command.

```
user@host> show vlans vlan-10
Routing instance        VLAN name             VLAN ID     Interfaces
default-switch          vlan-10                    10          ge-0/0/0.0
                                                               ge-0/0/1.0
                                                               ge-0/1/0.0
                                                               ge-0/1/1.0
```

Related Documentation

- Understanding Secure Wire on page 71

Example: Simplifying Chassis Cluster Deployment with Secure Wire over Redundant Ethernet Interfaces

Supported Platforms SRX Series

If you are connecting an SRX Series chassis cluster to other network devices, you can use secure wire to simplify the cluster deployment in the network. No changes to routing or forwarding tables on the cluster and no reconfiguration of neighboring devices is needed. Secure wire allows traffic to be forwarded unchanged between specified redundant Ethernet interfaces on the SRX Series chassis cluster as long as it is permitted by security policies or other security features. Follow this example if you are connecting an SRX Series chassis cluster to other network devices through redundant Ethernet interfaces.

Requirements

Before you begin:

- Connect a pair of the same SRX Series devices in a chassis cluster.
- Configure the chassis cluster node ID and cluster ID.
- Set the number of redundant Ethernet interfaces in the chassis cluster.
- Configure the chassis cluster fabric.
- Configure chassis cluster redundancy group (in this example redundancy group 1 is used).

For more information, see the *Chassis Cluster for Security Devices*.

Overview

Secure wire is supported over redundant Ethernet interfaces in a chassis cluster. The two redundant Ethernet interfaces must be configured in the same redundancy group. If failover occurs, both redundant Ethernet interfaces should fail over together.

NOTE: Secure wire mapping of redundant Ethernet link aggregation groups (LAGs) are not supported. LACP is not supported.

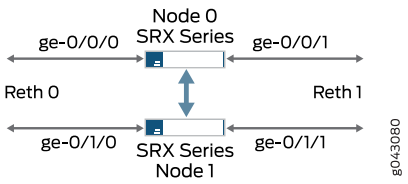
This example configures the secure wire reth-sw that maps ingress interface reth0.0 to egress interface reth1.0. Each redundant Ethernet interface consists of two child interfaces, one on each node of the chassis cluster. The two redundant Ethernet interfaces are configured for access mode. VLAN ID 10 is configured for the VLAN vlan-10 and the redundant Ethernet interfaces.

NOTE: A specific VLAN ID or VLAN ID list must be configured for a VLAN.

Topology

Figure 8 on page 85 shows the redundant Ethernet interfaces that are mapped in secure wire reth-sw.

Figure 8: Secure Wire Redundant Ethernet Interfaces



Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set vlans vlan-10 vlan-id 10
set interfaces ge-0/0/0 gigether-options redundant-parent reth0
set interfaces ge-0/0/1 gigether-options redundant-parent reth1
set interfaces ge-0/1/0 gigether-options redundant-parent reth0
set interfaces ge-0/1/1 gigether-options redundant-parent reth1
set interfaces reth0 unit 0 family ethernet-switching interface-mode access vlan-id 10
set interfaces reth1 unit 0 family ethernet-switching interface-mode access vlan-id 10
set interfaces reth0 redundant-ether-options redundancy-group 1
set interfaces reth1 redundant-ether-options redundancy-group 1
set security forwarding-options secure-wire reth-sw interface [reth0.0 reth1.0]
```

```
set security zones security-zone trust interfaces reth0.0
set security zones security-zone untrust interfaces reth1.0
set security policies default-policy permit-all
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a secure wire mapping for chassis cluster redundant Ethernet interfaces:

1. Configure the VLAN.

```
[edit vlans vlan-10]
user@host# set vlan-id 10
```

2. Configure the redundant Ethernet interfaces.

```
[edit interfaces ]
user@host# set ge-0/0/0 gigether-options redundant-parent reth0
user@host# set ge-0/0/1 gigether-options redundant-parent reth1
user@host# set ge-0/1/0 gigether-options redundant-parent reth0
user@host# set ge-0/1/1 gigether-options redundant-parent reth1

user@host#set reth0 unit 0 family ethernet-switching interface-mode access vlan-id
  10
user@host#set reth1 unit 0 family ethernet-switching interface-mode access vlan-id
  10

user@host# set reth0 redundant-ether-options redundancy-group 1
user@host# set reth1 redundant-ether-options redundancy-group 1
```

3. Configure the secure wire mapping.

```
[edit security forwarding-options]
user@host# set secure-wire reth-sw interface [reth0.0 reth1.0]
```

4. Configure security zones.

```
[edit security zones]
user@host# set security-zone trust interfaces reth0.0
user@host# set security-zone untrust interfaces reth1.0
```

5. Configure a security policy to permit traffic.

```
[edit security policies]
user@host# set default-policy permit-all
```

Results

From configuration mode, confirm your configuration by entering the **show vlans**, **show interfaces**, **show security forwarding-options**, and **show security zones** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@host# show vlans
  vlan-10 {
    vlan-id 10;
  }
  user@host# show interfaces
```

```
    ge-0/0/0 {
      gigether-options {
        redundant-parent reth0;
      }
    }
    ge-0/0/1 {
      gigether-options {
        redundant-parent reth1;
      }
    }
    ge-0/1/0 {
      gigether-options {
        redundant-parent reth0;
      }
    }
    ge-0/1/1 {
      gigether-options {
        redundant-parent reth1;
      }
    }
    reth0 {
      redundant-ether-options {
        redundancy-group 1;
      }
      unit 0 {
        family ethernet-switching {
          interface-mode access;
          vlan-id 10;
        }
      }
    }
    reth1 {
      redundant-ether-options {
        redundancy-group 1;
      }
      unit 0 {
        family ethernet-switching {
          interface-mode access;
          vlan-id 10;
        }
      }
    }
    user@host# show security forwarding-options
    secure-wire reth-sw {
      interfaces [reth0.0 reth1.0];
    }
  user@host# show security zones
    security-zone trust {
      interfaces {
        reth0.0;
      }
    }
    security-zone untrust {
      interfaces {
        reth1.0;
      }
```

```
}
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying Secure Wire Mapping on page 88
- Verifying the VLAN on page 88

Verifying Secure Wire Mapping

Purpose Verify the secure wire mapping.

Action From operational mode, enter the **show security forwarding-options secure-wire** command.

```
user@host> show security forward-options secure-wire
node0:
--------------------------------------------------------------------------
Secure wire                       Interface       Link   Interface       Link

reth-sw                           reth0.0         up     reth1.0         up

Total secure wires: 1

node1:
--------------------------------------------------------------------------
Secure wire                       Interface       Link   Interface       Link

reth-sw                           reth0.0         up     reth1.0         up

Total secure wires: 1
```

Verifying the VLAN

Purpose Verify the VLAN.

Action From operational mode, enter the **show vlan vlan-10** command.

```
user@host> show vlan vlan-10
Routing instance        VLAN Name            VLAN ID     Interfaces
default-switch          vlan-10                   10         reth0.0
                                                             reth1.0
```

Related Documentation

- Understanding Secure Wire on page 71
- Example: Simplifying Chassis Cluster Deployment with Secure Wire over Aggregated Redundant Ethernet Interfaces on page 88

Example: Simplifying Chassis Cluster Deployment with Secure Wire over Aggregated Redundant Ethernet Interfaces

Supported Platforms SRX Series

If you are connecting an SRX Series chassis cluster to other network devices, you can use secure wire to simplify the cluster deployment in the network. No changes to routing or forwarding tables on the cluster and no reconfiguration of neighboring devices is needed. Secure wire allows traffic to be forwarded unchanged between specified redundant Ethernet interfaces on the SRX Series chassis cluster as long as it is permitted by security policies or other security features. Follow this example if you are connecting an SRX Series chassis cluster to other network devices through aggregated redundant Ethernet interfaces.

NOTE: Secure wires cannot be configured for redundant Ethernet interface link aggregation groups (LAGs). For the secure wire mapping shown in this example, there is no LAG configuration on the SRX Series chassis cluster. Each redundant Ethernet interface consists of two child interfaces, one on each node of the chassis cluster. Users on upstream or downstream devices connected to the SRX Series cluster can configure the redundant Ethernet interface child links in LAGs.

Requirements

Before you begin:

- Connect a pair of the same SRX Series devices in a chassis cluster.
- Configure the chassis cluster node ID and cluster ID.
- Set the number of redundant Ethernet interfaces in the chassis cluster.
- Configure the chassis cluster fabric.
- Configure the chassis cluster redundancy group (in this example, redundancy group 1 is used).

For more information, see the *Chassis Cluster for Security Devices*.

Overview

This example configures secure wires for four redundant Ethernet interfaces: reth0, reth1, reth2, and reth3. Each redundant Ethernet interface consists of two child interfaces, one on each node of the chassis cluster. All four redundant Ethernet interfaces must be in the same VLAN—in this example, the VLAN is vlan-0. Two of the redundant Ethernet interfaces, reth0.0 and reth2.0, are assigned to the trust zone, while the other two interfaces, reth1.0 and reth3.0, are assigned to the untrust zone.

This example configures the following secure wires:

- reth-sw1 maps interface reth0.0 to interface reth1.0

- reth-sw2 maps interface reth2.0 to reth3.0

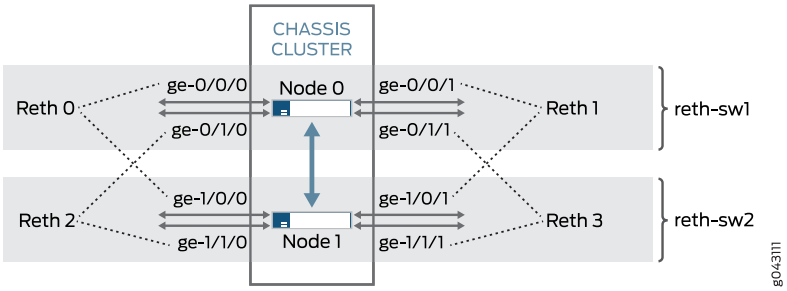
All redundant Ethernet interfaces are configured for access mode. VLAN ID 10 is configured for the VLAN vlan-0 and the redundant Ethernet interfaces.

NOTE: A specific VLAN ID or VLAN ID list must be configured for a VLAN.

Topology

Figure 9 on page 90 shows the redundant Ethernet interface child links that are mapped in secure wire configurations reth-sw1 and reth-sw2. Each redundant Ethernet interface consists of two child interfaces, one on each node of the chassis cluster.

Figure 9: Secure Wire Redundant Ethernet Interface Child Links



Users on upstream or downstream devices connected to the SRX Series cluster can configure redundant Ethernet interface child links in a LAG as long as the LAG does not span chassis cluster nodes. For example, ge-0/0/0 and ge-0/1/0 and ge-0/0/1 and ge-0/1/1 on node 0 can be configured as LAGs on connected devices. In the same way, ge-1/0/0 and ge-1/1/0 and ge-1/0/1 and ge-1/1/1 on node 1 can be configured as LAGs on connected devices.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set vlans vlan-0 vlan-id 10
set interfaces ge-0/0/0 gigether-options redundant-parent reth0
set interfaces ge-0/0/1 gigether-options redundant-parent reth1
set interfaces ge-0/1/0 gigether-options redundant-parent reth2
set interfaces ge-0/1/1 gigether-options redundant-parent reth3
set interfaces ge-1/0/0 gigether-options redundant-parent reth0
set interfaces ge-1/0/1 gigether-options redundant-parent reth1
set interfaces ge-1/1/0 gigether-options redundant-parent reth2
set interfaces ge-1/1/1 gigether-options redundant-parent reth3
set interfaces reth0 unit 0 family ethernet-switching interface-mode access vlan-id 10
set interfaces reth1 unit 0 family ethernet-switching interface-mode access vlan-id 10
```

```
set interfaces reth2 unit 0 family ethernet-switching interface-mode access vlan-id 10
set interfaces reth3 unit 0 family ethernet-switching interface-mode access vlan-id 10
set interfaces reth0 redundant-ether-options redundancy-group 1
set interfaces reth1 redundant-ether-options redundancy-group 1
set interfaces reth2 redundant-ether-options redundancy-group 1
set interfaces reth3 redundant-ether-options redundancy-group 1
set security forwarding-options secure-wire reth-sw1 interface [reth0.0 reth1.0]
set security forwarding-options secure-wire reth-sw2 interface [reth2.0 reth3.0]
set security zones security-zone trust interfaces reth0.0
set security zones security-zone trust interfaces reth2.0
set security zones security-zone untrust interfaces reth1.0
set security zones security-zone untrust interfaces reth3.0
set security policies default-policy permit-all
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a secure wire mapping for aggregated interface member links:

1. Configure the VLAN.

```
[edit vlans vlan-0]
user@host# set vlan-id 10
```

2. Configure the redundant Ethernet interfaces.

```
[edit interfaces ]
user@host# set ge-0/0/0 gigether-options redundant-parent reth0
user@host# set ge-0/0/1 gigether-options redundant-parent reth1
user@host# set ge-0/1/0 gigether-options redundant-parent reth2
user@host# set ge-0/1/1 gigether-options redundant-parent reth3
user@host# set ge-1/0/0 gigether-options redundant-parent reth0
user@host# set ge-1/0/1 gigether-options redundant-parent reth1
user@host# set ge-1/1/0 gigether-options redundant-parent reth2
user@host# set ge-1/1/1 gigether-options redundant-parent reth3

user@host# set reth0 unit 0 family ethernet-switching interface-mode access
  vlan-id 10
user@host# set reth1 unit 0 family ethernet-switching interface-mode access vlan-id
  10
user@host# set reth2 unit 0 family ethernet-switching interface-mode access vlan-id
  10
user@host# set reth3 unit 0 family ethernet-switching interface-mode access vlan-id
  10

user@host# set reth0 redundant-ether-options redundancy-group 1
user@host# set reth1 redundant-ether-options redundancy-group 1
user@host# set reth2 redundant-ether-options redundancy-group 1
user@host# set reth3 redundant-ether-options redundancy-group 1
```

3. Configure the secure wire mappings.

```
[edit security forwarding-options]
user@host# set secure-wire reth-sw1 interface [reth0.0 reth1.0]
user@host# set secure-wire reth-sw2 interface [reth2.0 reth3.0]
```

4. Configure security zones.

```
[edit security zones]
user@host# set security-zone trust interfaces reth0.0
user@host# set security-zone trust interfaces reth2.0

user@host# set security-zone untrust interfaces reth1.0
user@host# set security-zone untrust interfaces reth3.0
```

5. Configure a security policy to permit traffic.

```
[edit security policies]
user@host# set default-policy permit-all
```

Results From configuration mode, confirm your configuration by entering the **show vlans**, **show interfaces**, **show security forwarding-options**, and **show security zones** commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

```
user@host# show vlans
  vlan-0 {
    vlan-id 10;
  }
  user@host# show interfaces
  ge-0/0/0 {
    gigether-options {
      redundant-parent reth0;
    }
  }
  ge-0/0/1 {
    gigether-options {
      redundant-parent reth1;
    }
  }
  ge-0/1/0 {
    gigether-options {
      redundant-parent reth2;
    }
  }
  ge-0/1/1 {
    gigether-options {
      redundant-parent reth3;
    }
  }
  ge-1/0/0 {
    gigether-options {
      redundant-parent reth0;
    }
  }
  ge-1/0/1 {
    gigether-options {
      redundant-parent reth1;
    }
  }
  ge-1/1/0 {
```



```
    gigether-options {
      redundant-parent reth2;
    }
  }
  ge-1/1/1 {
    gigether-options {
      redundant-parent reth3;
    }
  }
  reth0 {
    redundant-ether-options {
      redundancy-group 1;
    }
    unit 0 {
      family ethernet-switching {
        interface-mode access;
        vlan-id 10;
      }
    }
  }
  reth1 {
    redundant-ether-options {
      redundancy-group 1;
    }
    unit 0 {
      family ethernet-switching {
        interface-mode access;
        vlan-id 10;
      }
    }
  }
  reth2 {
    redundant-ether-options {
      redundancy-group 1;
    }
    unit 0 {
      family ethernet-switching {
        interface-mode access;
        vlan-id 10;
      }
    }
  }
  reth3 {
    redundant-ether-options {
      redundancy-group 1;
    }
    unit 0 {
      family ethernet-switching {
        interface-mode access;
        vlan-id 10;
      }
    }
  }
  user@host# show security forwarding-options
  secure-wire reth-sw1 {
    interfaces [reth0.0 reth1.0];
```

```
    }
    secure-wire reth-sw2 {
      interfaces [reth2.0 reth3.0];
    }
user@host# show security zones
    security-zone trust {
      interfaces {
        reth0.0;
        reth2.0;
      }
    }
    security-zone untrust {
      interfaces {
        reth1.0;
        reth3.0;
      }
    }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Confirm that the configuration is working properly.

- Verifying Secure Wire Mapping on page 94
- Verifying VLAN on page 94

Verifying Secure Wire Mapping

Purpose Verify the secure wire mapping.

Action From operational mode, enter the **show security forwarding-options secure-wire** command.

```
user@host> show security forward-options secure-wire
node0:
--------------------------------------------------------------------------
Secure wire                       Interface       Link   Interface       Link

reth-sw1                          reth0.0         up     reth1.0         up
reth-sw2                          reth2.0         up     reth3.0         up

Total secure wires: 2

node1:
--------------------------------------------------------------------------
Secure wire                       Interface       Link   Interface       Link

reth-sw1                          reth0.0         up     reth1.0         up
reth-sw2                          reth2.0         up     reth3.0         up

Total secure wires: 2
```

Verifying VLAN

Purpose Verify the VLAN.

Action From operational mode, enter the **show vlans vlan-0** command.

```
user@host> show vlans vlan-0
Routing instance        VLAN name            VLAN ID     Interfaces
default-switch          vlan-0                    10
                                                        reth0.0
                                                        reth1.0
                                                        reth2.0
                                                        reth3.0
```

Related Documentation

- Understanding Secure Wire on page 71
- Example: Simplifying Chassis Cluster Deployment with Secure Wire over Redundant Ethernet Interfaces on page 84

PART 3

Configuring Ethernet Ports for Switching

CHAPTER 12

Configuring Switching Modes

Understanding Switching Modes

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345

There are two types of switching modes:

- Switching Mode–The uPIM appears in the list of interfaces as a single interface, which is the first interface on the uPIM. For example, ge-2/0/0. You can optionally configure each uPIM port only for autonegotiation, speed, and duplex mode. A uPIM in switching mode can perform the following functions:
  - Layer 3 forwarding—Routes traffic destined for WAN interfaces and other PIMs present on the chassis.
  - Layer 2 forwarding—Switches intra-LAN traffic from one host on the LAN to another LAN host (one port of uPIM to another port of same uPIM).
- Enhanced Switching Mode–Each port can be configured for switching or routing mode. This usage differs from the routing and switching modes, in which all ports must be in either switching or routing mode. The uPIM in enhanced switching mode provides the following features:
  - Supports configuration of different types of VLANs and inter-VLAN routing.
  - Supports Layer 2 control plane protocol such as Link Aggregation Control Protocol (LACP).
  - Supports port-based Network Access Control (PNAC) by means of authentication servers.

NOTE: The SRX300 and SRX320 devices support enhanced switching mode only. When you set a multiport uPIM to enhanced switching mode, all the Layer 2 switching features are supported on the uPIM. (Platform support depends on the Junos OS release in your installation.)

You can set a multiport Gigabit Ethernet uPIM on a device to either switching or enhanced switching mode.

When you set a multiport uPIM to switching mode, the uPIM appears as a single entity for monitoring purposes. The only physical port settings that you can configure are autonegotiation, speed, and duplex mode on each uPIM port, and these settings are optional.

Related Documentation

- Example: Configuring Switching Modes on page 106
- Ethernet Ports Switching Overview on page 100

Ethernet Ports Switching Overview

Supported Platforms SRX Series

Certain ports on Juniper Networks devices can function as Ethernet access switches that switch traffic at Layer 2 and route traffic at Layer 3.

You can deploy supported devices in branch offices as an access or desktop switch with integrated routing capability, thus eliminating intermediate access switch devices from your network topology. The Ethernet ports provide switching while the Routing Engine provides routing functionality, enabling you to use a single device to provide routing, access switching, and WAN interfaces.

This topic contains the following sections:

Supported Devices and Ports

Juniper Networks supports switching features on a variety of Ethernet ports and devices (see Table 12 on page 100). Platform support depends on the Junos OS release in your installation. The following ports and devices are included:

- Onboard Ethernet ports (Gigabit and Fast Ethernet built-in ports) on the SRX300, SRX320, SRX320 PoE, SRX340, SRX345, SRX550M and SRX1500 devices.
- Multiport Gigabit Ethernet XPIM on the SRX650 device.

Table 12: Supported Devices and Ports for Switching Features

Device	Ports
SRX100 devices	Onboard Fast Ethernet ports (**fe-0/0/0** and **fe-0/0/7**)

Table 12: Supported Devices and Ports for Switching Features *(continued)*

Device	Ports
SRX210 devices	Onboard Gigabit Ethernet ports (**ge-0/0/0** and **ge-0/0/1**) and 1-Port Gigabit Ethernet SFP Mini-PIM port. Onboard Fast Ethernet ports (**fe-0/0/2** and **fe-0/0/7**)
SRX220 devices	Onboard Gigabit Ethernet ports (**ge-0/0/0** through **ge-0/0/7**) and 1-Port Gigabit Ethernet SFP Mini-PIM port.
SRX240 devices	Onboard Gigabit Ethernet ports (**ge-0/0/0** through **ge-0/0/15**) and 1-Port Gigabit Ethernet SFP Mini-PIM port.
SRX300 devices	Onboard Gigabit Ethernet ports (**ge-0/0/0** and **ge-0/0/7**)
SRX320 devices	Onboard Gigabit Ethernet ports (**ge-0/0/0** and **ge-0/0/7**)
SRX340 devices	Onboard Gigabit Ethernet ports (**ge-0/0/0** through **ge-0/0/15**)
SRX345 devices	Onboard Gigabit Ethernet ports (**ge-0/0/0** through **ge-0/0/15**)
SRX550 devices	Onboard Gigabit Ethernet ports (**ge-0/0/0** through **ge-0/0/9**, Multiport Gigabit Ethernet XPIM modules, and 1-Port Gigabit Ethernet SFP Mini-PIM port.
SRX550M devices	Onboard Gigabit Ethernet ports (**ge-0/0/0** through **ge-0/0/9** and Multiport Gigabit Ethernet XPIM modules.
SRX650 devices	Multiport Gigabit Ethernet XPIM modules NOTE: On SRX650 devices, Ethernet switching is not supported on Gigabit Ethernet interfaces (**ge-0/0/0** through **ge-0/0/3** ports).
SRX1500 devices	Onboard Gigabit Ethernet ports (**ge-0/0/0** through **ge-0/0/19**)

On the SRX300, SRX320, SRX340 and SRX345 devices, you can set the onboard Gigabit Ethernet ports to operate as either switched ports or routed ports.

Integrated Bridging and Routing

Integrated bridging and routing (IRB) provides support for simultaneous Layer 2 swiching and Layer 3 routing within the same VLAN. Packets arriving on an interface of the VLAN are switched or routed based on the destination MAC address of the packet. Packets with the router's MAC address as the destination are routed to other Layer 3 interfaces.

Link Layer Discovery Protocol and LLDP-Media Endpoint Discovery

Devices use Link Layer Discovery Protocol (LLDP) and LLDP-Media Endpoint Discovery (MED) to learn and distribute device information on network links. The information allows

the device to quickly identify a variety of systems, resulting in a LAN that interoperates smoothly and efficiently.

LLDP-capable devices transmit information in Type Length Value (TLV) messages to neighbor devices. Device information can include specifics, such as chassis and port identification and system name and system capabilities. The TLVs leverage this information from parameters that have already been configured in the Junos OS.

LLDP-MED goes one step further, exchanging IP-telephony messages between the device and the IP telephone. These TLV messages provide detailed information on Power over Ethernet (PoE) policy. The PoE Management TLVs let the device ports advertise the power level and power priority needed. For example, the device can compare the power needed by an IP telephone running on a PoE interface with available resources. If the device cannot meet the resources required by the IP telephone, the device could negotiate with the telephone until a compromise on power is reached.

The following basic TLVs are supported:

- Chassis Identifier—The MAC address associated with the local system.
- Port identifier—The port identification for the specified port in the local system.
- Port Description—The user-configured port description. The port description can be a maximum of 256 characters.
- System Name—The user-configured name of the local system. The system name can be a maximum of 256 characters.
- Switching Features Overview—This information is not configurable, but taken from the software.
- System Capabilities—The primary function performed by the system. The capabilities that system supports; for example, Ethernet switching or router. This information is not configurable, but based on the model of the product.
- Management Address—The IP management address of the local system.

The following LLDP-MED TLVs are supported:

- LLDP-MED Capabilities—A TLV that advertises the primary function of the port. The values range from 0 through 15:
  - 0—Capabilities
  - 1—Network policy
  - 2—Location identification
  - 3—Extended power through medium-dependent interface power-sourcing equipment (MDI-PSE)
  - 4—Inventory
  - 5–15—Reserved
- LLDP-MED Device Class Values:

- 0—Class not defined
- 1—Class 1 device
- 2—Class 2 device
- 3—Class 3 device
- 4—Network connectivity device
- 5–255— Reserved

NOTE: On SRX100, SRX210, SRX220, SRX240, SRX300, SRX320, SRX340, SRX345, and SRX650 devices, on VLAN-tagged routed interfaces, LLDP is not supported. (Platform support depends on the Junos OS release in your installation.)

- Network Policy—A TLV that advertises the port VLAN configuration and associated Layer 2 and Layer 3 attributes. Attributes include the policy identifier, application types, such as voice or streaming video, 802.1Q VLAN tagging, and 802.1p priority bits and Diffserv code points.
- Endpoint Location—A TLV that advertises the physical location of the endpoint.
- Extended Power via MDI—A TLV that advertises the power type, power source, power priority, and power value of the port. It is the responsibility of the PSE device (network connectivity device) to advertise the power priority on a port.

LLDP and LLDP-MED must be explicitly configured on uPIMs (in enhanced switching mode) on base ports on SRX100, SRX210, SRX240, SRX300, SRX320, SRX340, and SRX345 devices, and Gigabit Backplane Physical Interface Modules (GPIMs) on SRX650 devices. (Platform support depends on the Junos OS release in your installation.) To configure LLDP on all interfaces or on a specific interface, use the **lldp** statement at the [**set protocols**] hierarchy. To configure LLDP-MED on all interfaces or on a specific interface, use the **lldp-med** statement at the [**set protocols**] hierarchy.

Types of Switch Ports

The ports, or interfaces, on a switch operate in either access mode or trunk mode.

An interface in access mode connects to a network device, such as a desktop computer, an IP telephone, a printer, a file server, or a security camera. The interface itself belongs to a single VLAN. The frames transmitted over an access interface are normal Ethernet frames.

Trunk interfaces handle traffic for multiple VLANs, multiplexing the traffic for all those VLANs over the same physical connection. Trunk interfaces are generally used to interconnect switches to one another.

Q-in-Q VLAN Tagging

Q-in-Q tunneling, defined by the IEEE 802.1ad standard, allows service providers on Ethernet access networks to extend a Layer 2 Ethernet connection between two customer sites.

In Q-in-Q tunneling, as a packet travels from a customer VLAN (C-VLAN) to a service provider's VLAN, a service provider-specific 802.1Q tag is added to the packet. This additional tag is used to segregate traffic into service-provider-defined service VLANs (S-VLANs). The original customer 802.1Q tag of the packet remains and is transmitted transparently, passing through the service provider's network. As the packet leaves the S-VLAN in the downstream direction, the extra 802.1Q tag is removed.

NOTE: **When Q-in-Q tunneling is configured for a service provider's VLAN, all Routing Engine packets, including packets from the routed VLAN interface, that are transmitted from the customer-facing access port of that VLAN will always be untagged.**

There are three ways to map C-VLANs to an S-VLAN:

- All-in-one bundling—Use the **dot1q-tunneling** statement at the [**edit vlans**] hierarchy to map without specifying customer VLANs. All packets from a specific access interface are mapped to the S-VLAN.
- Many-to-one bundling—Use the **customer-vlans** statement at the [**edit vlans**] hierarchy to specify which C-VLANs are mapped to the S-VLAN.
- Mapping C-VLAN on a specific interface—Use the **mapping** statement at the [**edit vlans**] hierarchy to map a specific C-VLAN on a specified access interface to the S-VLAN.

Table 13 on page 104 lists the C-VLAN to S-VLAN mapping supported on SRX Series devices. (Platform support depends on the Junos OS release in your installation.)

Table 13: Supported Mapping Methods

Mapping	SRX210	SRX240	SRX320	SRX340	SRX650
All-in-one bundling	Yes	Yes	Yes	Yes	Yes
Many-to-one bundling	No	No	No	No	Yes
Mapping C-VLAN on a specific interface	No	No	No	No	Yes

NOTE: On SRX650 devices, in the dot1q-tunneling configuration options, customer VLANs range and VLAN push do not work together for the same S-VLAN, even when you commit the configuration. If both are configured, then VLAN push takes priority over customer VLANs range.

IRB interfaces are supported on Q-in-Q VLANs for SRX210, SRX240, SRX300, SRX320, SRX340, SRX345, and SRX650 devices. Packets arriving on an IRB interface on a Q-in-Q VLAN are routed regardless of whether the packet is single or double tagged. The outgoing routed packets contain an S-VLAN tag only when exiting a trunk interface; the packets exit the interface untagged when exiting an access interface. (Platform support depends on the Junos OS release in your installation.)

In a Q-in-Q deployment, customer packets from downstream interfaces are transported without any changes to source and destination MAC addresses. You can disable MAC address learning at both the interface level and the VLAN level. Disabling MAC address learning on an interface disables learning for all the VLANs of which that interface is a member. When you disable MAC address learning on a VLAN, MAC addresses that have already been learned are flushed.

On SRX100, SRX210, SRX240, SRX300, SRX320, SRX340, SRX345, and SRX650 devices (with platform support depending on the Junos OS release in your installation), on the Layer 3 aggregated Ethernet, the following features are not supported:

- Encapsulations (such as CCC, VLAN CCC, VPLS, and PPPoE)
- J-Web
- On all SRX Series devices, the Link Layer Discovery Protocol (LLDP) is not supported on reth interfaces.
- On SRX550M devices the aggregate Ethernet (ae) interface with XE member interface cannot be configured with the Ethernet switching family.
- On all branch SRX Series devices, the Q-in-Q support on a Layer 3 interface has the following limitations:
  - Double tagging is not supported on reth and ae interfaces.
  - Multitopology routing is not supported in flow mode and in chassis clusters.
  - Dual tagged frames are not supported on encapsulations (such as CCC, TCC, VPLS, and PPPoE)
  - On Layer 3 logical interfaces, input-vlan-map, output-vlan-map, inner-range, and inner-list are not applicable
  - Only TPIDs with 0x8100 are supported, and the maximum number of tags is 2.
  - Dual tagged frames are accepted only for logical interfaces with IPV4 and IPv6 families.

- On SRX100, SRX210, SRX240, SRX300, SRX320, SRX340, SRX345, and SRX650 devices (with platform support depending on the Junos OS release in your installation), on the routed VLAN interface (RVI), the following features are not supported:
  - IS-IS (family ISO)
  - Encapsulations (Ether CCC, VLAN CCC, VPLS, PPPoE, and so on) on VLAN interfaces
  - CLNS
  - DVMRP
  - VLAN interface MAC change
  - G-ARP
  - Change VLAN-Id for VLAN interface

Related Documentation

- Understanding Switching Modes on page 99

Example: Configuring Switching Modes

Supported Platforms SRX300, SRX320, SRX340, SRX345

Requirements

Before you begin, see "Ethernet Ports Switching Overview" on page 100.

Overview

In this example, you configure **chassis** and set the l2-learning protocol to global mode switching. You then set a physical port parameter on the l2-learning protocols.

Configuration

CLI Quick Configuration

To quickly configure this example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set protocols l2-learning global-mode switching
set interfaces ge-0/0/1 unit 0 family ethernet-switching interface-mode access
```

Step-by-Step Procedure

To configure switching mode:

1. Set l2-learning protocol to global mode switching.

```
[edit protocols l2-learning]
user@host# set protocols l2-learning global-mode switching
```

2. Set a physical port parameter on the l2-learning protocols.

```
[edit]
user@host# set interfaces ge-0/0/1 unit 0 family ethernet-switching interface-mode
  access
```

3. If you are done configuring the device, commit the configuration.

```
[edit]
user@host# commit
```

Verification

To verify the configuration is working properly, enter the **show interfaces ge-0/0/1 switch-options** and **show protocols l2-learning** commands.

Related Documentation

- Ethernet Ports Switching Overview on page 100

CHAPTER 13

Configuring VLANs in Switching Mode

Understanding VLANs

Supported Platforms SRX Series

Each VLAN is a collection of network nodes that are grouped together to form separate broadcast domains. On an Ethernet network that is a single LAN, all traffic is forwarded to all nodes on the LAN. On VLANs, frames whose origin and destination are in the same VLAN are forwarded only within the local VLAN. Frames that are not destined for the local VLAN are the only ones forwarded to other broadcast domains. VLANs thus limit the amount of traffic flowing across the entire LAN, reducing the possible number of collisions and packet retransmissions within a VLAN and on the LAN as a whole.

On an Ethernet LAN, all network nodes must be physically connected to the same network. On VLANs, the physical location of the nodes is not important, so you can group network devices in any way that makes sense for your organization, such as by department or business function, by types of network nodes, or even by physical location. Each VLAN is identified by a single IP subnetwork and by standardized IEEE 802.1Q encapsulation.

To identify which VLAN the traffic belongs to, all frames on an Ethernet VLAN are identified by a tag, as defined in the IEEE 802.1Q standard. These frames are tagged and are encapsulated with 802.1Q tags.

For a simple network that has only a single VLAN, all traffic has the same 802.1Q tag. When an Ethernet LAN is divided into VLANs, each VLAN is identified by a unique 802.1Q tag. The tag is applied to all frames so that the network nodes receiving the frames know to which VLAN a frame belongs. Trunk ports, which multiplex traffic among a number of VLANs, use the tag to determine the origin of frames and where to forward them.

For VLAN configuration details, see Table 14 on page 110.

Table 14: VLAN Configuration Details

Field	Function	Action
General		
VLAN Name	Specifies a unique name for the VLAN.	Enter a name. NOTE: VLAN text field is disabled when vlan-tagging is not enabled.
VLAN ID/Range	Specifies the identifier or range for the VLAN.	Select one: • **VLAN ID**—Type a unique identification number from **1** through **4094**. If no value is specified, it defaults to 1. • **VLAN Range**—Type a number range to create VLANs with IDs corresponding to the range. For example, the range 2–3 will create two VLANs with the ID 2 and 3.
Description	Describes the VLAN.	Enter a brief description for the VLAN.
Input Filter	Specifies the VLAN firewall filter that is applied to incoming packets.	To apply an input firewall filter, select the firewall filter from the list.
Output Filter	Specifies the VLAN firewall filter that is applied to outgoing packets.	To apply an output firewall filter, select the firewall filter from the list.
Ports		
Ports	Specifies the ports to be associated with this VLAN for data traffic. You can also remove the port association.	Click one: • **Add**—Select the ports from the available list. • **Remove**—Select the port that you do not want associated with the VLAN.
IP Address		
Layer 3 Information	Specifies IP address options for the VLAN.	Select to enable the IP address options.
IP Address	Specifies the IP address of the VLAN.	Enter the IP address.
Subnet Mask	Specifies the range of logical addresses within the address space that is assigned to an organization.	Enter the address, for example, **203.0.113.0**. You can also specify the address prefix.
Input Filter	Specifies the VLAN interface firewall filter that is applied to incoming packets.	To apply an input firewall filter to an interface, select the firewall filter from the list.
Output Filter	Specifies the VLAN interface firewall filter that is applied to outgoing packets.	To apply an output firewall filter to an interface, select the firewall filter from the list.
ARP/MAC Details	Specifies the details for configuring the static IP address and MAC.	Click the **ARP/MAC Details** button. Enter the static IP address and MAC address in the window that is displayed.
VoIP		

Table 14: VLAN Configuration Details *(continued)*

Field	Function	Action
Ports	Specifies the ports to be associated with this VLAN for voice traffic. You can also remove the port association.	Click one: • **Add**—Select the ports from the available list. • **Remove**—Select the port that you do not want associated with the VLAN.

NOTE: On SRX100 devices, dynamic VLAN assignments and guest VLANs are not supported.

On SRX240, SRX300, SRX340, SRX345 and SRX650 devices, the VLAN range from 3967 to 4094 falls under the reserved VLAN address range, and the user is not allowed any configured VLANs from this range. Platform support depends on the Junos OS release in your installation.

Related Documentation

- Example: Configuring VLANs on page 111
- Ethernet Ports Switching Overview on page 100

Example: Configuring VLANs

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550M

This example shows you how to configure a VLAN.

Requirements

Before you begin:

- Determine which interfaces to use and verify that they are in switch mode. See "Understanding VLANs" on page 109.
- Determine what ports to use on the device and how to segment your network. See "Ethernet Ports Switching Overview" on page 100.

Overview

In this example, you create a new VLAN and then configure attributes.

Configuration

GUI Step-by-Step Procedure

To access the VLAN:

1. In the J-Web user interface, select **Configure>Switching>VLAN**.

   The VLAN configuration page displays a list of existing VLANs. If you select a specific VLAN, the specific VLAN details are displayed in the details section.

2. Click one:

- **Add**—Creates a VLAN.
- **Edit**—Edits an existing VLAN configuration.
- **Delete**—Deletes an existing VLAN.

NOTE: If you delete a VLAN, the VLAN configuration for all the associated interfaces is also deleted.

Add or edit VLAN information.

3. Click one:
   - **OK**—Saves the configuration and returns to the main configuration page, then click **Commit Options**>**Commit**.
   - **Cancel**—Cancels your entries and returns to the main configuration page.

Related Documentation

- Understanding VLANs on page 109
- Ethernet Ports Switching Overview on page 100

Example: Configuring VLANs (CLI Procedure)

Supported Platforms SRX1500, SRX300, SRX320, SRX340, SRX345, SRX550M

This example shows you how to configure a VLAN.

Requirements

Before you begin:

- Determine which interfaces to use and verify that they are in switch mode. See "Understanding VLANs" on page 109.
- Determine what ports to use on the device and how to segment your network. See "Ethernet Ports Switching Overview" on page 100.

Overview

In this example, you create a new VLAN and then configure attributes. You can configure one or more VLANs to perform Layer 2 switching. The Layer 2 switching functions include integrated routing and bridging (IRB) for support for Layer 2 switching and Layer 3 IP routing on the same interface. SRX Series devices can function as Layer 2 switches, each

with multiple switching, or broadcast, domains that participate in the same Layer 2 network.

Configuration

CLI Quick Configuration

To quickly configure this section of the example, copy the following commands, paste them into a text file, remove any line breaks, change any details necessary to match your network configuration, copy and paste the commands into the CLI at the **[edit]** hierarchy level, and then enter **commit** from configuration mode.

```
set vlans v10 vlan-id 10
set vlans v10 l3-interface irb.10
set interfaces irb unit 10 family inet address 10.1.1.10/24
set interfaces ge-0/0/1 unit 0 family ethernet-switching vlan members 10
```

Step-by-Step Procedure

The following example requires you to navigate various levels in the configuration hierarchy. For instructions on how to do that, see *Using the CLI Editor in Configuration Mode* in the *CLI User Guide*.

To configure a VLAN:

1. Create the VLAN by setting the unique VLAN name and configuring the VLAN ID.

   ```
   [edit vlans]
   user@host# set vlans v10 vlan-id 10
   ```

2. Bind a Layer 3 interface with the VLAN.

   ```
   [edit]
   user@host# set vlans v10 l3-interface irb.10
   ```

3. Create the subnet for the VLAN's broadcast domain.

   ```
   [edit]
   user@host# set interfaces irb unit 10 family inet address 10.1.1.10/24
   ```

4. Assign an interface to the VLAN by specifying the logical interface (with the unit statement) and specifying the VLAN name as the member.

   ```
   [edit]
   user@host# set interfaces ge-0/0/1 unit 0 family ethernet-switching vlan members
     10
   ```

Results

From configuration mode, confirm your configuration by entering the **show vlans** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show vlans
v10 {
   vlan-id 10;
   l3-interface irb.10;
}
user@host# show interfaces
ge-0/0/1 {
   unit 0 {
      family ethernet-switching {
```

```
        vlan {
          members 10;
        }
      }
    }
  }
  irb {
    unit 10 {
      family inet {
        address 10.1.1.10/24;
      }
    }
  }
```

If you are done configuring the device, enter **commit** from configuration mode.

Verification

Verifying VLANs

Purpose Verify that VLANs are configured and assigned to the interfaces.

Action From operational mode, enter the **show vlans** command.

```
user@host> show vlans

Routing instance        VLAN name               Tag         Interfaces
default-switch          default                 1

default-switch          v10                     10
                                                            ge-0/0/1.0
```

Meaning The output shows the VLANs are configured and assigned to the interfaces.

Related Documentation

- Understanding VLANs on page 109
- Ethernet Ports Switching Overview on page 100

Example: Configuring a Guest VLAN

Supported Platforms SRX300, SRX320, SRX340, SRX345

This example shows how to configure a guest VLAN for limited network access or for Internet-only access to avoid compromising a company's security.

NOTE: Starting in Junos OS Release 15.1X49-D40, guest VLANs are not supported.

- Requirements on page 115
- Overview on page 115

Requirements

Before you begin, verify that the interfaces that will be used are in switch mode. See "Example: Configuring Switching Modes" on page 106 and "Understanding Switching Modes" on page 99.

Overview

In this example, you configure a VLAN called visitor-vlan with a VLAN ID of 300. Then you set protocols and configure visitor-vlan as the guest VLAN.

Configuration

Step-by-Step Procedure

To configure a guest VLAN:

1. Configure a VLAN.

   ```
   [edit]
   user@host# set vlans visitor-vlan vlan-id 300
   ```

2. Specify the guest VLAN.

   ```
   [edit]
   user@host# set protocols dot1x authenticator interface all guest-vlan visitor-vlan
   ```

3. If you are done configuring the device, commit the configuration.

   ```
   [edit]
   user@host# commit
   ```

Verification

To verify the configuration is working properly, enter the **show vlans** and **show protocols dot1x** commands.

Release History Table

Release	Description
15.1X49-D40	Starting in Junos OS Release 15.1X49-D40, guest VLANs are not supported.

Related Documentation

- Understanding VLANs on page 109
- Ethernet Ports Switching Overview on page 100

CHAPTER 14

Configuring Link Aggregation Control Protocol

Understanding Link Aggregation Control Protocol

Supported Platforms SRX Series, vSRX

LACP, a subcomponent of IEEE 802.3ad, provides additional functionality for link aggregation groups (LAGs). Use the link aggregation feature to aggregate one or more Ethernet interfaces to form a logical point-to-point link, known as a LAG, virtual link, or bundle. The MAC client can treat this virtual link like a single link.

Starting with Junos OS Release 15.1X49-D80, Link Aggregation Control Protocol (LACP) is supported in Layer 2 transparent mode in addition to existing support in Layer 3 mode for SRX300, SRX320, SRX340, SRX345, SRX1500, SRX4100, SRX4200 devices and vSRX instances. Starting with Junos OS Release 15.1X49-D40, Link Aggregation Control Protocol (LACP) is supported in Layer 2 transparent mode in addition to existing support in Layer 3 mode for SRX5400, SRX5600 and SRX5800 devices. When the SRX Series device uses LACP to bundle the member links, it creates high-speed connections, also known as *fat pipe*, with peer systems. Bandwidth can be increased by adding member links. Increased bandwidth is important especially for redundant Ethernet (reth) and aggregated Ethernet (ae) interfaces, for transmitting and receiving packets to and from the peer end for the whole system. LACP also provides automatic determination, configuration, and monitoring member links. LACP is compatible with other peers that run the 802.3ad LACP protocol. It automatically binds the member links without manually configuring the LAG, thereby avoiding errors.

NOTE: Tentative sessions are created for all interfaces in a particular VLAN. If there is plenty of one-way traffic, numerous tentative sessions are created. When sessions reach the maximum limit, vector fails and packet loss might be seen.

This topic contains the following sections:

Link Aggregation Benefits

Link aggregation increases bandwidth, provides graceful degradation as failure occurs, and increases availability. It provides network redundancy by load-balancing traffic across all available links. If one of the links should fail, the system automatically load-balances traffic across all remaining links.

When LACP is not enabled, a local LAG might attempt to transmit packets to a remote single interface, which causes the communication to fail. When LACP is enabled, a local LAG cannot transmit packets unless a LAG with LACP is also configured on the remote end of the link.

A typical LAG deployment includes aggregate trunk links between an access switch and a distribution switch or customer edge (CE) device.

Link Aggregation Configuration Guidelines

When configuring link aggregation, note the following guidelines and restrictions:

- Link aggregation is supported only for Ethernet interfaces that are configured in switching mode (**family ethernet-switching**). Aggregating interfaces that are configured in routed mode (**family inet**) is also supported.
- You can configure a LAG by specifying the link number as a physical device and then associating a set of ports with the link. All the ports must have the same speed and be in full-duplex mode. Junos OS assigns a unique ID and port priority to each port. The ID and priority are not configurable.
- You can optionally configure LACP for link negotiation.
- You can optionally configure LACP for link protection.
- You can create up to eight Ethernet ports in each bundle.
- Each LAG must be configured on both sides of the link. The ports on either side of the link must be set to the same speed. At least one end of the LAG should be configured as active.
- LAGs are not supported on virtual chassis port links.
- By default, Ethernet links do not exchange protocol data units (PDUs), which contain information about the state of the link. You can configure Ethernet links to actively transmit PDUs, or you can configure the links to passively transmit them, sending out LACP PDUs only when they receive them from another link. The transmitting link is known as the actor and the receiving link is known as the partner.
- LAGs can only be used for a point-to-point connection.

For LACP configuration details, see Table 15 on page 119 and Table 16 on page 119.

Table 15: LACP (Link Aggregation Control Protocol) Configuration

Field	Function
Aggregated Interface	Indicates the name of the aggregated interface.
Link Status	Indicates whether the interface is linked (Up) or not linked (Down).
VLAN (VLAN ID)	Virtual LAN identifier value for IEEE 802.1Q VLAN tags (0.4094).
Description	The description for the LAG.

Table 16: Details of Aggregation

Field	Function
Administrative Status	Displays if the interface is enabled (Up) or disabled (Down).
Logical Interfaces	Shows the logical interface of the aggregated interface.
Member Interfaces	Member interfaces hold all the aggregated interfaces of the selected interfaces.
Port Mode	Specifies the mode of operation for the port: trunk or access.
Native VLAN (VLAN ID)	VLAN identifier to associate with untagged packets received on the interface.
IP Address/Subnet Mask	Specifies the address of the aggregated interfaces.
IPV6 Address/Subnet Mask	Specifies the IPV6 address of the aggregated interfaces.

For aggregated Ethernet interface options, see Table 17 on page 119.

Table 17: Aggregated Ethernet Interface Options

Field	Function	Action
Aggregated Interface	Indicates the name of the aggregated interface.	Enter the aggregated interface name. If an aggregated interface already exists, then the field is displayed as read-only.
LACP Mode	Specifies the mode in which LACP packets are exchanged between the interfaces. The modes are: • None—Indicates that no mode is applicable. • Active—Indicates that the interface initiates transmission of LACP packets • Passive—Indicates that the interface only responds to LACP packets.	Select from the list.

Table 17: Aggregated Ethernet Interface Options *(continued)*

Field	Function	Action
Description	The description for the LAG.	Enter the description.
Interface	Indicates that the interfaces available for aggregation.	Click **Add** to select the interfaces. NOTE: Only interfaces that are configured with the same speeds can be selected together for a LAG.
Speed	Indicates the speed of the interface.	
Enable Log	Specifies whether to enable generation of log entries for LAG.	Select to enable log generation.

NOTE: On SRX100, SRX110, SRX210, SRX220, SRX240, SRX300, SRX320, SRX340, SRX345 and SRX650 devices, the speed mode and link mode configuration are available for member interfaces of ae. (Platform support depends on the Junos OS release in your installation.)

For VLAN options, see Table 18 on page 120.

Table 18: Edit VLAN Options

Field	Function	Action
Port Mode	Specifies the mode of operation for the port: trunk or access.	If you select Trunk, you can: 1. Click **Add** to add a VLAN member. 2. Select the VLAN and click **OK**. 3. (Optional) Associate a native VLAN ID with the port. If you select Access, you can: 1. Select the VLAN member to be associated with the port. 2. (Optional) Associate a VoIP VLAN with the interface. Only a VLAN with a VLAN ID can be associated as a VoIP VLAN. 3. Click **OK**.
VLAN Options	For trunk interfaces, the VLANs for which the interface can carry traffic.	Click **Add** to select VLAN members.
Native VLAN	VLAN identifier to associate with untagged packets received on the interface.	Select the VLAN identifier.

Release History Table

Release	Description
15.1X49-D80	Starting with Junos OS Release 15.1X49-D80, Link Aggregation Control Protocol (LACP) is supported in Layer 2 transparent mode in addition to existing support in Layer 3 mode for SRX300, SRX320, SRX340, SRX345, SRX1500, SRX4100, SRX4200 devices and vSRX instances.
15.1X49-D40	Starting with Junos OS Release 15.1X49-D40, Link Aggregation Control Protocol (LACP) is supported in Layer 2 transparent mode in addition to existing support in Layer 3 mode for SRX5400, SRX5600 and SRX5800 devices.

Related Documentation

- Example: Configuring Link Aggregation Control Protocol on page 121
- Ethernet Ports Switching Overview on page 100
- *Verifying Switching Mode Configuration*

Example: Configuring Link Aggregation Control Protocol

Supported Platforms SRX Series, vSRX

This example shows how to configure LACP.

Requirements

Before you begin:

- Verify that the Ethernet interfaces are in switch mode. See "Understanding VLANs" on page 109.
- Link aggregation of one or more interfaces must be set up to form a virtual link or link aggregation group (LAG) before you can apply LACP.

Overview

In this example, you configure link aggregation for switched Ethernet interfaces then apply LACP.

Configuration

GUI Step-by-Step Procedure

To access the LACP Configuration:

1. In the J-Web user interface, select **Configure>Interfaces>Link Aggregation**.

   The Aggregated Interfaces list is displayed.

2. Click one of the following:

   - **Device Count**—Creates an aggregated Ethernet interface, or LAG. You can choose the number of device that you want to create.
   - **Add**—Adds a new aggregated Ethernet Interface, or LAG.
   - **Edit**— Modifies a selected LAG

- **Aggregation**—Modifies an selected LAG.
- **VLAN**—Specifies VLAN options for the selected LAG.
- **IP Option**—Configuring IP address to LAG is not supported and when you try to configure the IP address an error message is displayed.

- **Delete**—Deletes the selected LAG.
- **Disable Port** or **Enable Port**—Disables or enables the administrative status on the selected interface.

3. Click one:
   - Click **OK** to check your configuration and save it as a candidate configuration, then click **Commit Options**>**Commit**.
   - Click **Cancel** to cancel the configuration without saving changes.

Related Documentation

- Understanding Link Aggregation Control Protocol on page 117
- Ethernet Ports Switching Overview on page 100

PART 4

Configuration Statements and Operational Commands

CHAPTER 15

Configuration Statements

code-points (CoS)

Supported Platforms SRX Series, vSRX

Syntax code-points [*aliases*] [*bit-patterns*];

Hierarchy Level [edit class-of-service classifiers (dscp) *classifier-name* forwarding-class *class-name* loss-priority *level*]

Release Information Statement introduced in Junos OS Release 11.1 for the QFX Series.
Statement introduced in Junos OS Release 14.1X53-D20 for the OCX Series.

Description Configure one or more code-point aliases or bit sets to apply to a forwarding class.

NOTE: OCX Series switches do not support MPLS, so they do not support EXP code points or code point aliases.

Options ***aliases***—Name of the alias or aliases.

bit-patterns—Value of the code-point bits, in decimal form.

Required Privilege Level interfaces—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Understanding Interfaces*
- Example: Configuring BA Classifiers on Transparent Mode Devices on page 56

destination-address (Security Policies)

Supported Platforms SRX Series, vSRX

Syntax

```
destination-address {
  [address];
  any;
  any-ipv4;
  any-ipv6;
}
```

Hierarchy Level [edit security policies from-zone *zone-name* to-zone *zone-name* policy *policy-name* match]

[edit security policies global policy *policy-name* match]

Release Information Statement introduced in Junos OS Release 8.5. Support for IPv6 addresses added in Junos OS Release 10.2. Support for IPv6 addresses in active/active chassis cluster configurations (in addition to the existing support of active/passive chassis cluster configurations) added in Junos OS Release 10.4. Support for wildcard addresses added in Junos OS Release 11.1.

Description Define the matching criteria. You can specify one or more IP addresses, address sets, or wildcard addresses. You can specify wildcards **any**, **any-ipv4**, or **any-ipv6**.

Options ***address***—IP address (**any**, **any-ipv4**, **any-ipv6**), IP address set, or address book entry, or wildcard address (represented as A.B.C.D/wildcard-mask). You can configure multiple addresses or address prefixes separated by spaces and enclosed in square brackets.

Required Privilege Level security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

- *Security Policies Overview*

domain-type (VLANs)

Supported Platforms SRX Series, vSRX

Syntax domain-type vlans;

Hierarchy Level [edit vlans *vlans-name*]

Release Information Statement modified in Junos OS Release 9.5.

Description Define the type of domain for a Layer 2 VLAN.

Required Privilege Level routing—To view this statement in the configuration.
routing–control—To add this statement to the configuration.

Related Documentation

- Layer 2 Transparent Mode Overview on page 25

encapsulation (Interfaces)

Supported Platforms SRX Series, vSRX

Syntax
```
encapsulation (ether-vpls-ppp | ethernet-bridge | ethernet-ccc | ethernet-tcc | ethernet-vpls
  | extended-frame-relay-ccc | extended-frame-relay-tcc | extended-vlan-bridge |
  extended-vlan-ccc | extended-vlan-tcc | extended-vlan-vpls | frame-relay-port-ccc |
  vlan-ccc | vlan-vpls);
```

Hierarchy Level [edit interfaces *interface-name* unit *logical-unit-number*]

Release Information Statement introduced in Junos OS Release 9.5.

Description Specify logical link layer encapsulation.

Options

- **frame-relay**—Configure a Frame Relay encapsulation when the physical interface has multiple logical units, and the units are either point to point or multipoint.
- **multilink-frame-relay-uni-nni**—Link services interfaces functioning as FRF.16 bundles can use Multilink Frame Relay UNI NNI encapsulation.
- **ppp**—For normal mode (when the device is using only one ISDN B-channel per call). Point-to-Point Protocol is for communication between two computers using a serial interface.
- **ppp-over-ether**—This encapsulation is used for underlying interfaces of pp0 interfaces.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Understanding Physical Encapsulation on an Interface*

ethernet-switching

Supported Platforms SRX Series, vSRX

Syntax

```
ethernet-switching {
  block-non-ip-all;
  bpdu-vlan-flooding;
  bypass-non-ip-unicast;
  no-packet-flooding {
    no-trace-route;
  }
}
```

Hierarchy Level [edit security flow]

Release Information Statement introduced in Junos OS Release 9.5.

Description Changes default Layer 2 forwarding behavior.

Options

- **block-non-ip-all**—Block all Layer 2 non-IP and non-ARP traffic, including multicast and broadcast traffic.
- **bypass-non-ip-unicast**—Allow all Layer 2 non-IP traffic to pass through the device.
- **no-packet-flooding**—Stop IP flooding and send ARP or ICMP requests to discover the destination MAC address for a unicast packet.
  - **no-trace-route**—Do not send ICMP requests to discover the destination MAC address for a unicast packet. Only ARP requests are sent. This option only allows the device to discover the destination MAC address for a unicast packet if the destination IP address is in the same subnetwork as the ingress IP address.

NOTE: **The block-non-ip-all and bypass-non-ip-unicast options cannot be configured at the same time.**

Required Privilege Level security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

- *Juniper Networks Devices Processing Overview*

family inet (Interfaces)

Supported Platforms SRX Series, vSRX

Syntax

```
inet {
  accounting {
    destination-class-usage;
    source-class-usage {
      input;
      output;
    }
  }
  address (source–address/prefix) {
    arp destination-address {
      (mac mac-address | multicast-mac multicast-mac-address);
      publish publish-address;
    }
    broadcast address;
    preferred;
    primary;
    vrrp-group group-id {
      (accept-data | no-accept-data);
      advertise-interval seconds;
      advertisements-threshold number;
      authentication-key key-value;
      authentication-type (md5 | simple);
      fast-interval milliseconds;
      inet6-advertise-interval milliseconds
      (preempt <hold-time seconds> | no-preempt );
      priority value;
      track {
        interface interface-name {
          bandwidth-threshold bandwidth;
          priority-cost value;
        }
        priority-hold-time seconds;
        route route-address{
          routing-instance routing-instance;
          priority-cost value;
        }
      }
      virtual-address [address];
      virtual-link-local-address address;
      vrrp-inherit-from {
        active-group value;
        active-interface interface-name;
      }
    }
    web-authentication {
      http;
      https;
      redirect-to-https;
    }
  }
  dhcp {
```

```
    client-identifier {
      (ascii string | hexadecimal string);
    }
    lease-time (length | infinite);
    retransmission-attempt value;
    retransmission-interval seconds;
    server-address server-address;
    update-server;
    vendor-id vendor-id ;
  }
  dhcp-client {
    client-identifier {
      prefix {
        host-name;
        logical-system-name;
        routing-instance-name;
      }
      use-interface-description (device | logical);
      user-id (ascii string| hexadecimal string);
    }
    lease-time (length | infinite);
    retransmission-attempt value;
    retransmission-interval seconds;
    server-address server-address;
    update-server;
    vendor-id vendor-id ;
  }
  filter {
    group number;
    input filter-name;
    input-list [filter-name];
    output filter-name;
    output-list [filter-name];
  }
  mtu value;
  no-neighbor-learn;
  no-redirects;
  policer {
    arp arp-name;
    input input-name;
    output output-name;
  }
  primary;
  rpf-check {
    fail-filter filter-name;
    mode {
      loose;
    }
  }
  sampling {
    input;
    output;
    simple-filter;
  }
  targeted-broadcast {
    (forward-and-send-to-re |forward-only);
```

```
    }
    unnumbered-address {
      interface-name;
      preferred-source-address preferred-source-address;
    }
}
```

Hierarchy Level [edit interfaces *interface* unit *unit*]

Release Information Statement supported in Junos 10.2 for SRX Series devices.

Description Assign an IP address to a logical interface.

Options *ipaddress*—Specify the IP address for the interface. The remaining statements are explained separately.

NOTE: You use family inet to assign an IPv4 address. You use family inet6 to assign an IPv6 address. An interface can be configured with both an IPv4 and IPv6 address.

Required Privilege Level **interface**—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Understanding Interfaces*

family inet6

Supported Platforms SRX Series, vSRX

Syntax

```
inet6 {
  accounting {
    destination-class-usage;
    source-class-usage {
      input;
      ouput;
    }
  }
  address source–address/prefix {
    eui-64;
    ndp address {
      (mac mac-address | multicast-mac multicast-mac-address);
      publish;
    }
    preferred;
    primary;
    vrrp-inet6-group group_id {
      (accept-data | no-accept-data);
      advertisements-threshold number;
      authentication-key value;
      authentication-type (md5 | simple);
      fast-interval milliseconds;
      inet6-advertise-interval milliseconds;
      (preempt <hold-time seconds>| no-preempt );
      priority value;
      track {
        interface interface-name {
          bandwidth-threshold value;
          priority-cost value;
        }
        priority-hold-time seconds;
        route route-address{
          routing-instance routing-instance;
        }
      }
      virtual-inet6-address [address];
      virtual-link-local-address address;
      vrrp-inherit-from {
        active-group value;
        active-interface interface-name;
      }
    }
    web-authentication {
      http;
      https;
      redirect-to-https;
    }
  }
  (dad-disable | no-dad-disable);
  dhcpv6-client {
    client-ia-type (ia-na | ia-pd);
```

```
    client-identifier duid-type (duid-ll | duid-llt | vendor);
    client-type (autoconfig | stateful);
    rapid-commit;
    req-option (dns-server | domain | fqdn | nis-domain | nis-server | ntp-server | sip-domain
      | sip-server |time-zone | vendor-spec);
    retransmission-attempt number;
    update-router-advertisement {
      interface interface-name;
    }
    update-server;
  }
  filter {
    group number;
    input filter-name;
    input-list [filter-name];
    output filter-name;
    output-list [filter-name];
  }
  mtu value;
  nd6-stale-time seconds;
  no-neighbor-learn;
  policer {
    input input-name;
    output output-name;
  }
  rpf-check {
    fail-filter filter-name;
    mode {
      loose;
    }
  }
  sampling {
    input;
    output;
  }
  unnumbered-address {
    interface-name;
    preferred-source-address preferred-source-address;
  }
}
```

Hierarchy Level [edit interfaces *interface* unit *unit*]

Release Information Statement supported in Junos 10.2 for SRX Series devices.

Description Assign an IPV6 address to a logical interface.

Options *ipaddress*—Specify the IP address for the interface. The remaining statements are explained separately.

NOTE: You use family inet6 to assign an IPv6 address. You use family inet to assign an IPv4 address. An interface can be configured with both an IPv4 and IPv6 address.

Required Privilege Level

interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Understanding Interfaces*

flow (Security Flow)

Supported Platforms SRX Series, vSRX

Syntax

```
flow {
  aging {
    early-ageout seconds;
    high-watermark percent;
    low-watermark percent;
  }
  allow-dns-reply;
  ethernet-switching {
    block-non-ip-all;
    bpdu-vlan-flooding;
    bypass-non-ip-unicast;
    no-packet-flooding {
      no-trace-route;
    }
  }
  force-ip-reassembly;
  ipsec-performance-acceleration;
  load distribution {
    session-affinity ipsec;
  }
  pending-sess-queue-length (high | moderate | normal);
  route-change-timeout seconds;
  syn-flood-protection-mode (syn-cookie | syn-proxy);
  tcp-mss {
    all-tcp mss value;
    gre-in {
      mss value;
    }
    gre-out {
      mss value;
    }
    ipsec-vpn {
      mss value;
    }
  }
  tcp-session {
    fin-invalidate-session;
    no-sequence-check;
    no-syn-check;
    no-syn-check-in-tunnel;
    rst-invalidate-session;
    rst-sequence-check;
    strict-syn-check;
    tcp-initial-timeout seconds;
    time-wait-state {
      (session-ageout | session-timeout seconds);
    }
  }
  traceoptions {
    file {
      filename;
```

```
        files number;
        match regular-expression;
        size maximum-file-size;
        (world-readable | no-world-readable);
      }
      flag flag;
      no-remote-trace;
      packet-filter filter-name {
        destination-port port-identifier;
        destination-prefix address;
        interface interface-name;
        protocol protocol-identifier;
        source-port port-identifier;
        source-prefix address;
      }
      rate-limit messages-per-second;
    }
}
```

Hierarchy Level [edit security]

Release Information Statement modified in Junos OS Release 9.5.

Description Determine how the device manages packet flow. The device can regulate packet flow in the following ways:

- Enable or disable DNS replies when there is no matching DNS request.
- Set the initial session-timeout values.

Options The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

- *Juniper Networks Devices Processing Overview*
- *Understanding Session Characteristics for SRX Series Services Gateways*
- *Understanding Flow in Logical Systems for SRX Series Devices*

forwarding-classes (CoS)

Supported Platforms SRX Series, vSRX

Syntax

```
forwarding-classes {
  class class-name {
    priority (high | low);
    queue-num number;
    spu-priority (high | low);
  }
  queue queue-number {
    class-name {
      priority (high | low);
    }
  }
}
```

Hierarchy Level [edit class-of-service]

Release Information Statement introduced in Junos OS Release 8.5. Statement updated in Junos OS Release 11.4. The **spu-priority** option introduced in Junos OS Release 11.4R2.

Description Configure forwarding classes and assign queue numbers.

Options

- **class class-name**—Display the forwarding class name assigned to the internal queue number.

  NOTE: This option is supported only on high-end SRX Series devices, including the SRX1500, SRX5400, SRX5600, and SRX5800.

  NOTE: AppQoS forwarding classes must be different from those defined for interface-based rewriters.

- **policing-priority**—Layer 2 policing. One forwarding class can be configured as **premium** and others are configured as **normal**.
- **priority**—Fabric priority value:
  - **high**—Forwarding class's fabric queuing has high priority.
  - **low**—Forwarding class's fabric queuing has low priority.
- **queue queue-number**—Specify the internal queue number to which a forwarding class is assigned.
- **spu-priority**—Services Processing Unit (SPU) priority queue, either **high** or **low**.

NOTE: The spu-priority option is only supported on SRX1500 devices and SRX5000 line devices.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Example: Configuring AppQoS*

global-mac-table-aging-time (Protocols)

Supported Platforms SRX Series, vSRX

Syntax global-mac-table-aging-time *seconds*;

Hierarchy Level [edit protocols l2-learning]

Release Information Statement modified in Junos OS Release 9.5.

Description Configure the timeout interval for entries in the MAC table.

Default 300 seconds

Options
seconds—Time elapsed before MAC table entries are timed out and entries are deleted from the table.
Range: 10 through 64,000 seconds

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- Example: Configuring VLANs on page 31

global-mac-limit (Protocols)

Supported Platforms SRX Series

Syntax
```
global-mac-limit limit {
    packet-action drop;
}
```

Hierarchy Level [edit protocols l2-learning]

Release Information Statement modified in Junos OS Release 9.5.

Description Limit the number of media access control (MAC) addresses learned from the logical interfaces on the router.

Default 131,071 MAC addresses

NOTE: SRX300, SRX320, SRX340, and SRX345 devices support 16,383 addresses, and SRX1500 devices support 24,575 addresses.

Options ***limit***—Number of MAC addresses that can be learned on the device.

Range: 20 through 13,1071 addresses

The remaining statement is explained separately. See CLI Explorer.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Example: Configuring VLANs on page 31

global-mode (Protocols)

Supported Platforms SRX300, SRX320, SRX340, SRX345, SRX550M

Syntax global-mode (switching | transparent-bridge) ;

Hierarchy Level [edit protocols l2-learning]

Release Information Statement introduced in Junos OS Release 15.1X49-D40.

Description Specify the global mode for the SRX Series device as Layer 2 transparent bridge mode or switching mode. After changing the mode, you must reboot the device for the configuration to take effect.

Default transparent-bridge

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- l2-learning (Protocols) on page 147
- Ethernet Switching and Layer 2 Transparent Mode Overview on page 3

global-no-mac-learning (Protocols)

Supported Platforms SRX Series

Syntax global-no-mac-learning;

Hierarchy Level [edit protocols l2-learning]

Release Information Statement modified in Junos OS Release 9.5.

Description Disable MAC learning for the entire device.

Default MAC learning is enabled.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- Example: Configuring VLANs on page 31

host-inbound-traffic

Supported Platforms SRX Series, vSRX

Syntax

```
host-inbound-traffic {
  protocols protocol-name {
    except;
  }
  system-services service-name {
    except;
  }
}
```

Hierarchy Level [edit security zones functional-zone management],
[edit security zones functional-zone management interfaces *interface-name*],
[edit security zones security-zone *zone-name*],
[edit security zones security-zone *zone-name* interfaces *interface-name*]

Release Information Statement introduced in Junos OS Release 8.5.

Description Control the type of traffic that can reach the device from interfaces bound to the zone.

Options The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

- *Understanding How to Control Inbound Traffic Based on Traffic Types*
- *Understanding How to Control Inbound Traffic Based on Protocols*

inet6 (Security Forwarding Options)

Supported Platforms SRX Series, vSRX

Syntax

```
inet6 {
  mode (drop | flow-based | packet-based);
}
```

Hierarchy Level [edit security forwarding-options family]

Release Information Statement introduced in Junos OS Release 8.5.

Description Enable packet-based or flow-based processing of IPv6 traffic. By default, the device drops IPv6 traffic.

NOTE: Packet-based processing is not supported on the following SRX Series devices: SRX1500, SRX5600, and SRX5800.

Options The **mode** statement is described separately.

Required Privilege Level
security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

- family inet6 on page 133

interfaces (CoS)

Syntax

```
interfaces
  interface-name {
    input-scheduler-map map-name ;
    input-shaping-rate rate ;
    scheduler-map map-name ;
    scheduler-map-chassis map-name ;
    shaping-rate rate ;
    unit logical-unit-number {
      adaptive-shaper adaptive-shaper-name ;
      classifiers {
        (dscp | dscp-ipv6 | exp | ieee-802.1 | inet-precedence)
        ( classifier-name | default);
      }
      forwarding-class class-name ;
      fragmentation-map map-name ;
      input-scheduler-map map-name ;
      input-shaping-rate (percent percentage | rate );
      input-traffic-control-profile profiler-name shared-instance instance-name ;
      loss-priority-maps {
        default;
        map-name ;
      }
      output-traffic-control-profile profile-name shared-instance instance-name ;
      rewrite-rules {
        dscp ( rewrite-name | default);
        dscp-ipv6 ( rewrite-name | default);
        exp ( rewrite-name | default) protocol protocol-types ;
        frame-relay-de ( rewrite-name | default);
        inet-precedence ( rewrite-name | default);
      }
      scheduler-map map-name ;
      shaping-rate rate ;
      virtual-channel-group group-name ;
    }
  }
}
```

Hierarchy Level [edit class-of-service interface *interface-name* unit *number*]

Release Information Statement introduced in Junos OS Release 8.5.

Description Associate the class-of-service configuration elements with an interface.

Options interface *interface-name* unit *number*—The user-specified interface name and unit number.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Class of Service Feature Guide for Security Devices*

interfaces (Security Zones)

Supported Platforms SRX Series, vSRX

Syntax

```
interfaces interface-name {
  host-inbound-traffic {
    protocols protocol-name {
      except;
    }
    system-services service-name {
      except;
    }
  }
}
```

Hierarchy Level [edit security zones functional-zone management],
[edit security zones security-zone *zone-name*]

Release Information Statement introduced in Junos OS Release 8.5.

Description Specify the set of interfaces that are part of the zone.

Options ***interface-name*** —Name of the interface.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

- *Understanding Security Zones*

interface (Switching Options)

Supported Platforms SRX Series, vSRX

Syntax

```
interface interface-name {
  encapsulation-type;
  ignore-encapsulation-mismatch;
  pseudowire-status-tlv;
  static-mac mac-address {
    vlan-id vlan-id;
  }
}
```

Hierarchy Level [edit vlans *vlans-name* switch-options]

Release Information Statement modified in Junos OS Release 9.5.

Description Specify the logical interfaces to include in the VLAN.

Options

- ***interface-name***—Name of a logical interface.
- ***encapsulation-type***—Encapsulation type for VPN.
- ***ignore-encapsulation-mismatch***—Allow different encapsulation types on local and remote devices.
- ***pseudowire-status-tlv***—Send pseudowire status.
- ***mac-address***—Static MAC address assigned to the logical interface.
- ***vlan-id***—VLAN identifier.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Understanding VLANs on page 29

l2-learning (Protocols)

Supported Platforms SRX Series

Syntax

```
l2-learning {
  global-mac-limit limit {
  packet-action-drop
  }
  global-mac-table-aging-time seconds;
  global-mode (switching | transparent-bridge) ;
  global-no-mac-learning;
}
```

Hierarchy Level [edit protocols]

Release Information Statement modified in Junos OS Release 9.5. Support for global mode added in Junos OS Release 15.1X49-D40.

Description Configure Layer 2 address learning and forwarding properties globally.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- global-mac-table-aging-time (Protocols) on page 139
- global-mac-limit (Protocols) on page 140
- global-no-mac-learning (Protocols) on page 141
- global-mode (Protocols) on page 141

loss-priority (CoS Loss Priority)

Supported Platforms SRX Series, vSRX

Syntax loss-priority *level* code-points [*values*];

Hierarchy Level [edit class-of-service loss-priority-maps frame-relay-de *map-name*]

Release Information Statement introduced in Junos OS Release 9.2.

Description Map CoS values to a loss priority.

Options ***level*** can be one of the following:

- **high**—Packet has high loss priority.
- **medium-high**—Packet has medium-high loss priority.
- **medium-low**—Packet has medium-low loss priority.
- **low**—Packet has low loss priority.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Understanding Interfaces*

match (Security Policies)

Supported Platforms SRX Series, vSRX

Syntax

```
match {
  application {
    [application];
    any;
  }
  destination-address {
    [address];
    any;
    any-ipv4;
    any-ipv6;
  }
  source-address {
    [address];
    any;
    any-ipv4;
    any-ipv6;
  }
  source-identity {
    [role-name];
    any;
    authenticated-user;
    unauthenticated-user;
    unknown-user;
  }
}
```

Hierarchy Level [edit security policies from-zone *zone-name* to-zone *zone-name* policy *policy-name*]

Release Information Statement introduced in Junos OS Release 8.5. Statement updated with the **source-identity** option in Junos OS Release 12.1.

Description Configure security policy match criteria.

Options The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

- *Security Policies Overview*

native-vlan-id (Interfaces)

Supported Platforms SRX Series, vSRX

Syntax native-vlan-id*vlan-id*;

Hierarchy Level [edit interfaces *interface-name*]

Release Information Statement introduced in Junos OS Release 9.5.

Description Configure VLAN identifier for untagged packets received on the physical interface of a trunk mode interface.

Options ***vlan-id***—Configure a VLAN identifier for untagged packets. Enter a number from 0 through 4094.

Required Privilege Level **interface**—To view this statement in the configuration.
interface-control—To add this statement to the configuration

Related Documentation

- *Understanding Interfaces*

peer-selection-service

Supported Platforms SRX Series, vSRX

Syntax

```
peer-selection-service {
  command binary-file-path;
  disable;
  failover (alternate-media | other-routing-engine);
}
```

Hierarchy Level [edit system processes]

Release Information Statement introduced in Junos OS Release 8.5.

Description Enable the peer selection service process.

Options

- **command *binary-file-path***—Path to the binary process.
- **disable**—Disable the peer selection service process.
- **failover**—Configure the device to reboot if the software process fails four times within 30 seconds, and specify the software to use during the reboot.
  - **alternate-media**—Configure the device to switch to backup media that contains a version of the system if a software process fails repeatedly.
  - **other-routing-engine**—Instruct the secondary Routing Engine to take mastership if a software process fails. If this statement is configured for a process, and that process fails four times within 30 seconds, then the device reboots from the secondary Routing Engine.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- Interfaces Feature Guide for Security Devices

pgcp-service

Supported Platforms SRX Series, vSRX

Syntax

```
pgcp-service {
  command binary-file-path;
  disable;
  failover (alternate-media | other-routing-engine);
}
```

Hierarchy Level [edit system processes]

Release Information Statement introduced in Junos OS Release 8.5.

Description Specify the Packet Gateway Control Protocol (PGCP) that is required for the border gateway function (BGF) feature.

Options

- **command *binary-file-path***—Path to the binary process.
- **disable**—Disable the Packet Gateway Control Protocol (PGCP) process.
- **failover**—Configure the device to reboot if the software process fails four times within 30 seconds, and specify the software to use during the reboot.
  - **alternate-media**—Configure the device to switch to backup media that contains a version of the system if a software process fails repeatedly.
  - **other-routing-engine**—Instruct the secondary Routing Engine to take mastership if a software process fails. If this statement is configured for a process, and that process fails four times within 30 seconds, the device reboots from the secondary Routing Engine.

Required Privilege Level system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

policy (Security Policies)

Supported Platforms SRX Series, vSRX

Syntax

```
policy policy-name {
  description description;
  match {
    application {
      [application];
      any;
    }
    destination-address {
      [address];
      any;
      any-ipv4;
      any-ipv6;
    }
    source-address {
      [address];
      any;
      any-ipv4;
      any-ipv6;
    }
    source-identity {
      [role-name];
      any;
      authenticated-user;
      unauthenticated-user;
      unknown-user;
    }
  }
  scheduler-name scheduler-name;
  then {
    count {
      alarm {
        per-minute-threshold number;
        per-second-threshold number;
      }
    }
    deny;
    log {
      session-close;
      session-init;
    }
    permit {
      application-services {
        application-firewall {
          rule-set rule-set-name;
        }
        application-traffic-control {
          rule-set rule-set-name;
        }
        gprs-gtp-profile profile-name;
        gprs-sctp-profile profile-name;
        idp;
```

```
            redirect-wx | reverse-redirect-wx;
            ssl-proxy {
              profile-name profile-name;
            }
            uac-policy {
              captive-portal captive-portal;
            }
            utm-policy policy-name;
          }
          destination-address {
            drop-translated;
            drop-untranslated;
          }
          firewall-authentication {
            pass-through {
              access-profile profile-name;
              client-match user-or-group-name;
              web-redirect;
            }
            user-firewall {
              access-profile profile-name;
              domain domain-name
              ssl-termination-profile profile-name;
            }
            web-authentication {
              client-match user-or-group-name;
            }
          }
          services-offload;
          tcp-options {
            initial-tcp-mss mss-value;
            reverse-tcp-mss mss-value;
            sequence-check-required;
            syn-check-required;
          }
          tunnel {
            ipsec-group-vpn group-vpn;
            ipsec-vpn vpn-name;
            pair-policy pair-policy;
          }
        }
        reject;
      }
    }
```

Hierarchy Level [edit security policies from-zone *zone-name* to-zone *zone-name*]

Release Information Statement introduced in Junos OS Release 8.5. The **services-offload** option added in Junos OS Release 11.4. Statement updated with the **source-identity** option and the **description** option added in Junos OS Release 12.1. Support for the **user-firewall** option added in Junos OS Release 12.1X45-D10. Support for the **initial-tcp-mss** and **reverse-tcp-mss** options added in Junos OS Release 12.3X48-D20.

Description Define a security policy.

Options

policy-name—Name of the security policy.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level

security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

- *Configuring SSL Proxy*
- *Security Policies Overview*

profile (Access)

Supported Platforms SRX Series, vSRX

Syntax

```
profile profile-name  {
  accounting {
    accounting-stop-on-access-deny;
    accounting-stop-on-failure;
    coa-immediate-update;
    duplication;
    immediate-update;
    order [accounting-method];
    statistics (time | volume-time);
    update-interval minutes;
  }
  accounting-order [accounting-method];
  address-assignment pool pool-name;
  authentication-order [ldap | none | password | securid];
  authorization-order [jsrc];
  client client-name  {
    chap-secret  chap-secret;
    client-group [ group-names ];
    firewall-user {
      password password;
    }
    no-rfc2486;
    pap-password pap-password;
    x-auth ip-address;
  }
  client-name-filter {
    count number;
    domain-name domain-name;
    separator special-character;
  }
  ldap-options {
    assemble {
      common-name common-name;
    }
    base-distinguished-name base-distinguished-name;
    revert-interval seconds;
    search {
      admin-search {
        distinguished-name distinguished-name;
        password password;
      }
      search-filter search-filter-name;
    }
  }
  ldap-server server-address {
    port port-number;
    retry attempts;
    routing-instance routing-instance-name;
    source-address source-address;
    timeout seconds;
  }
```

```
    provisioning-order (gx-plus | jsrc);
    service {
      accounting-order {
        activation-protocol;
        radius;
      }
    }
    session-options {
      client-group [group-name];
      client-idle-timeout minutes;
      client-session-timeout minutes;
    }
}
```

Hierarchy Level [edit access]

Release Information Statement introduced in Junos OS Release 10.4.

Description Create a profile containing a set of attributes that define device management access.

Required Privilege Level access—To view this statement in the configuration.
access-control—To add this statement to the configuration.

Related Documentation
- *Understanding Interfaces*
- *Understanding User Authentication for Security Devices*
- Ethernet Switching and Layer 2 Transparent Mode Overview on page 3

redundancy-group (Interfaces)

Syntax **redundancy-group** ***number*** **;**

Hierarchy Level **[edit interfaces** ***interface-name*** **redundant-ether-options]**

Release Information Statement introduced in Junos OS Release 9.0.

Description Specify the redundancy group that a redundant Ethernet interface belongs to.

Options ***number*** —Number of the redundancy group that the redundant interface belongs to. Failover properties of the interface are inherited from the redundancy group.

Range: 1 through 255

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- Interfaces Feature Guide for Security Devices

secure-wire

Supported Platforms SRX Series

Syntax secure-wire *secure-wire-name* interface [*interface-name-1 interface-name-2*];

Hierarchy Level [edit security forwarding-options]

Release Information Statement introduced in Junos OS Release 12.3X48-D10.

Description Configure mapping of interfaces through which traffic is forwarded unchanged.

Options **secure secure-wire**—Specify a name for the secure wire interface mapping.

interface-name-1 interface-name-2—Specify a pair of peer logical interfaces that constitutes the secure wire mapping.

Required Privilege Level security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

security-zone

Supported Platforms SRX Series, vSRX

Syntax

```
security-zone zone-name {
  address-book {
    address address-name {
      ip-prefix {
        description text;
      }
      description text;
      dns-name domain-name {
        ipv4-only;
        ipv6-only;
      }
      range-address lower-limit to upper-limit;
      wildcard-address ipv4-address/wildcard-mask;
    }
    address-set address-set-name {
      address address-name;
      address-set address-set-name;
      description text;
    }
  }
  advance-policy-based-routing;
  application-tracking;
  description text;
  host-inbound-traffic {
    protocols protocol-name {
      except;
    }
    system-services service-name {
      except;
    }
  }
  interfaces interface-name {
    host-inbound-traffic {
      protocols protocol-name {
        except;
      }
      system-services service-name {
        except;
      }
    }
  }
  screen screen-name;
  tcp-rst;
}
```

Hierarchy Level [edit security zones]

Release Information Statement introduced in Junos OS Release 8.5. Support for wildcard addresses added in Junos OS Release 11.1. The **description** option added in Junos OS Release 12.1.

Description Define a security zone, which allows you to divide the network into different segments and apply different security options to each segment.

Options ***zone-name*** —Name of the security zone.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

- *Security Zones and Interfaces Overview*
- *Example: Configuring Application Firewall Rule Sets Within Security Policy*

shaping-rate (CoS Interfaces)

Supported Platforms SRX Series, vSRX

Syntax shaping-rate *rate*;

Hierarchy Level [edit class-of-service interfaces *interface-name*],
[edit class-of-service interfaces *interface-name* unit *logical-unit-number*]

Release Information Statement introduced in Junos OS Release 9.2.

Description For logical interfaces on which you configure packet scheduling, configure traffic shaping by specifying the amount of bandwidth to be allocated to the logical interface.

Logical and physical interface traffic shaping is mutually exclusive. This means you can include the **shaping-rate** statement at the **[edit class-of-service interfaces interface *interface-name*]** hierarchy level or the **[edit class-of-service interfaces interface *interface-name* unit *logical-unit-number*]** hierarchy level, but not both.

Alternatively, you can configure a shaping rate for a logical interface and oversubscribe the physical interface by including the **shaping-rate** statement at the **[edit class-of-service traffic-control-profiles]** hierarchy level. With this configuration approach, you can independently control the delay-buffer rate.

Default If you do not include this statement at the **[edit class-of-service interfaces interface *interface-name* unit *logical-unit-number*]** hierarchy level, the default logical interface bandwidth is the average of unused bandwidth for the number of logical interfaces that require default bandwidth treatment. If you do not include this statement at the **[edit class-of-service interfaces interface *interface-name*]** hierarchy level, the default physical interface bandwidth is the average of unused bandwidth for the number of physical interfaces that require default bandwidth treatment.

Options *rate*—Peak rate, in bits per second (bps). You can specify a value in bits per second either as a complete decimal number or as a decimal number followed by the abbreviation **k** (1000), **m** (1,000,000), or **g** (1,000,000,000).

Range: For logical interfaces, 1000 through 32,000,000,000 bps.

For physical interfaces, 1000 through 160,000,000,000 bps.

Required Privilege Level interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- Class of Service Feature Guide for Security Devices

source-address (Security Policies)

Supported Platforms SRX Series, vSRX

Syntax

```
source-address {
  [address];
  any;
  any-ipv4;
  any-ipv6;
}
```

Hierarchy Level [edit security policies from-zone *zone-name* to-zone *zone-name* policy *policy-name* match]

[edit security policies global policy *policy-name* match]

Release Information Statement introduced in Junos OS Release 8.5. Support for IPv6 addresses added in Junos OS Release 10.2. Support for IPv6 addresses in active/active chassis cluster configurations (in addition to the existing support of active/passive chassis cluster configurations) added in Junos OS Release 10.4. Support for wildcard addresses added in Junos OS Release 11.1.

Description Define the matching criteria. You can specify one or more IP addresses, address sets, or wildcard addresses. You can specify wildcards **any**, **any-ipv4**, or **any-ipv6**.

Options ***address***—IP addresses, address sets, or wildcard addresses (represented as A.B.C.D/wildcard-mask). You can configure multiple addresses or address prefixes separated by spaces and enclosed in square brackets.

Required Privilege Level security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation

- *Security Policies Overview*
- *Understanding Security Policy Rules*
- *Understanding Security Policy Elements*

static-mac (VLANs)

Supported Platforms SRX Series, vSRX

Syntax

```
static-mac mac-address {
   vlan-id vlan-id;
}
```

Hierarchy Level [edit vlans*vlan--name* switch-options interface *interface-name*]

Release Information Statement modified in Junos OS Release 9.5.

Description Configure a static MAC address for a logical interface in a VLAN.

Options

- ***mac-address***—MAC address
- ***vlan-id***—VLAN identifier

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Understanding VLANs on page 29

switch-options (VLANs)

Supported Platforms SRX Series, vSRX

Syntax

```
switch-options {
  interface interface-name {
    encapsulation-type;
    ignore-encapsulation-mismatch;
    pseudowire-status-tlv;
    static-mac mac-address {
      vlan-id vlan-id;
    }
  }
  mac-table-aging-time seconds;
  mac-table-size {
    number;
    packet-action drop;
  }
}
```

Hierarchy Level [edit vlans *vlans-name*]

Release Information Statement modified in Junos OS Release 9.5.

Description Configure Layer 2 learning and forwarding properties for a VLAN.

The remaining statements are explained separately. See CLI Explorer.

Required Privilege Level routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation

- Ethernet Switching and Layer 2 Transparent Mode Overview on page 3

system-services (Security Zones Interfaces)

Supported Platforms SRX Series, vSRX

Syntax

```
system-services service-name {
  except;
}
```

Hierarchy Level [edit security zones security-zone *zone-name* interfaces *interface-name* host-inbound-traffic]

Release Information Statement introduced in Junos OS Release 8.5.

Description Specify the types of traffic that can reach the device on a particular interface.

Options

- *service-name* —Service for which traffic is allowed. The following services are supported:
  - **all**—Enable all possible system services available on the Routing Engine (RE).
  - **any-service**—Enable services on entire port range.
  - **bootp**—Enable traffic destined to BOOTP and DHCP relay agents.
  - **dhcp**—Enable incoming DHCP requests.
  - **dhcpv6**—Enable incoming DHCP requests for IPv6.
  - **dns**—Enable incoming DNS services.
  - **finger**—Enable incoming finger traffic.
  - **ftp**—Enable incoming FTP traffic.
  - **http**—Enable incoming J-Web or clear-text Web authentication traffic.
  - **https**—Enable incoming J-Web or Web authentication traffic over Secure Sockets Layer (SSL).
  - **ident-reset**—Enable the access that has been blocked by an unacknowledged identification request.
  - **ike**—Enable Internet Key Exchange traffic.
  - **netconf SSH**—Enable incoming NetScreen Security Manager (NSM) traffic over SSH.
  - **ntp**—Enable incoming Network Time Protocol (NTP) traffic.
  - **ping**—Allow the device to respond to ICMP echo requests.
  - **r2cp**—Enable incoming Radio Router Control Protocol traffic.
  - **reverse-ssh**—Reverse SSH traffic.
  - **reverse-telnet**—Reverse Telnet traffic.
  - **rlogin**—Enable incoming **rlogin** (remote login) traffic.
  - **rpm**—Enable incoming real-time performance monitoring (RPM) traffic.
  - **rsh**—Enable incoming Remote Shell (**rsh**) traffic.

- **snmp**—Enable incoming SNMP traffic (UDP port 161).
- **snmp-trap**—Enable incoming SNMP traps (UDP port 162).
- **ssh**—Enable incoming SSH traffic.
- **telnet**—Enable incoming Telnet traffic.
- **tftp**—Enable TFTP services.
- **traceroute**—Enable incoming traceroute traffic (UDP port 33434).
- **xnm-clear-text**—Enable incoming Junos XML protocol traffic for all specified interfaces.
- **xnm-ssl**— Enable incoming Junos XML protocol-over-SSL traffic for all specified interfaces.

- **except**—(Optional) except can only be used if all has been defined.

Required Privilege Level
security—To view this statement in the configuration.
security-control—To add this statement to the configuration.

Related Documentation
- *Security Zones and Interfaces Overview*
- *Supported System Services for Host Inbound Traffic*

unframed | no-unframed (Interfaces)

Supported Platforms SRX1500, SRX550M, vSRX

Syntax
```
(unframed | no-unframed);
```

Hierarchy Level [edit interfaces *interface-name* t3-options]

Release Information Statement introduced in Junos OS Release 11.1.

Description Enable or disable framing for the T3 interface on a 1-Port Clear Channel DS3/E3 GPIM on an SRX Series device. By default, unframed mode is enabled. Select no-unframed to enable framing. Select unframed to return to the default mode.

Required Privilege Level
interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation
- *Example: Configuring a T3 Interface*

vlan-id (VLAN)

Supported Platforms EX Series, MX Series, SRX Series, vSRX

Syntax vlan-id (all | none | *number*);

Hierarchy Level [edit vlans *vlan-name*],
[edit logical-systems *logical-system-name* vlans*vlan-name*],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* vlans*vlan-name*],
[edit routing-instances *routing-instance-name* vlans *vlan--name*]

Release Information Statement introduced in Junos OS Release 8.4.
Support for Layer 2 trunk ports added in Junos OS Release 9.2.
Support for SRX 5600, and SRX 5800 devices added in Junos OS Release 9.6.
Support for logical systems added in Junos OS Release 9.6.
Statement introduced in Junos OS Release 12.3R2 for EX Series switches.

Description Specify a VLAN identifier (VID) to include in the packets sent to and from the VLAN, or a VPLS routing instance.

NOTE: When configuring a VLAN identifier for provider backbone bridge (PBB) routing instances, dual-tagged VIDs and the none option are not permitted.

Options *number*—A valid VLAN identifier. If you configure multiple VLANs with a valid VLAN identifier, you must specify a unique VLAN identifier for each. However, you can use the same VLAN identifier for VLANs that belong to different virtual switches. Use this option to send single tagged frames with the specified VLAN identifier over VPLS VT interfaces.

NOTE: If you specify a VLAN identifier, you cannot also use the all option. They are mutually exclusive.

all—Specify that the VLAN spans all the VLAN identifiers configured on the member logical interfaces.

NOTE: You cannot specify the all option if you include a routing interface in the VLAN.

none—Specify to enable shared VLAN learning or to send untagged frames over VPLS VT interfaces.

NOTE: Multichassis link aggregation (MC-LAG) does not support the none option with the vlan-id statement with VLANs.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- Example: Configuring VLANs on page 31
- *Example: Configuring Interfaces and Routing Instances for a User Logical System*

vlan members (VLANs)

Supported Platforms SRX Series

Syntax vlan members [*vlan-id*];

Hierarchy Level [edit vlans *vlan-name*]

Release Information Statement modified in Junos OS Release 9.5.

Description Specify multiple VLAN identifiers to create a VLAN for each VLAN identifier.

Options ***vlan-id***—A list of valid VLAN identifiers. A VLAN is created for each VLAN identifier in the list.

NOTE: If you specify a VLAN identifier list, you cannot configure an IRB interface in the VLAN.

Required Privilege Level
routing—To view this statement in the configuration.
routing-control—To add this statement to the configuration.

Related Documentation
- Example: Configuring VLANs on page 31

vlan-tagging (Interfaces)

Supported Platforms SRX Series, vSRX

Syntax vlan-tagging native-vlan-id *vlan-id*;

Hierarchy Level [edit interfaces *interface*]

Release Information Statement introduced in Junos OS Release 9.5.

Description Configure VLAN identifier for untagged packets received on the physical interface of a trunk mode interface.

Options **native-vlan-id**—Configures a VLAN identifier for untagged packets. Enter a number from 0 through 4094.

NOTE: The native-vlan-id can be configured only when either flexible-vlan-tagging mode or interface-mode trunk is configured.

Required Privilege Level **interface**—To view this statement in the configuration.
interface-control—To add this statement to the configuration.

Related Documentation

- *Configuring VLAN Tagging*

CHAPTER 16

Operational Commands

- clear security flow ip-action
- clear security flow session family
- show ethernet-switching mac-learning-log (View)
- show ethernet-switching table (View)
- show interfaces (SRX Series)
- show security flow gate family
- show security flow ip-action
- show security flow session family
- show security flow statistics
- show security flow status
- show security forward-options secure-wire
- show security policies
- show security zones
- show vlans

clear security flow ip-action

Supported Platforms SRX Series, vSRX

Syntax **clear security flow ip-action** [*filter*]

Release Information Command introduced in Junos OS Release 10.4. Logical systems option introduced in Junos OS Release 11.2.

Description Clear IP-action entries, based on filtered options, for IP sessions running on the device.

Options *filter*—Filter the display based on the specified criteria.

The following filters display those sessions that match the criteria specified by the filter. Refer to the sample output for filtered output examples.

all | [*filter*]—All active sessions on the device.

destination-port ***destination-port***—Destination port number of the traffic. Range is 1 through 65,535.

destination-prefix ***destination-prefix***—Destination IP prefix or address.

family (inet | inet6) [*filter*]—IPv4 traffic or IPv6-NATPT traffic and filtered options.

logical-system ***logical-system-name*** **| all** [*filter*]—Specified logical system or all logical systems.

protocol ***protocol-name*** **|** ***protocol-number*** [*filter*]—Protocol name or number and filtered options.

- **ah** or **51**
- **egp** or **8**
- **esp** or **50**
- **gre** or **47**
- **icmp** or **1**
- **icmp6** or **58**
- **ipip** or **4**
- **ospf** or **89**
- **pim** or **103**
- **rsvp** or **46**
- **sctp** or **132**
- **tcp** or **6**
- **udp** or **17**

root-logical-system [*filter*]—Default logical system information and filtered options.

source-port ***source-port***—Source port number of the traffic. Range is 1 through 65,535.

source-prefix ***source-prefix***—Source IP prefix or address of the traffic.

Required Privilege Level clear

Related Documentation
- show security flow ip-action on page 215

List of Sample Output
clear security flow ip-action all on page 173
clear security flow ip-action destination-prefix on page 173
clear security flow ip-action family inet on page 173
clear security flow ip-action protocol udp on page 173

Output Fields When you enter this command, the system responds with the status of your request.

Sample Output

clear security flow ip-action all

```
user@host>clear security flow ip-action all
1008 ip-action entries cleared
```

clear security flow ip-action destination-prefix

```
user@host>clear security flow ip-action destination-prefix 192.0.2.5/24
87 ip-action entries cleared
```

clear security flow ip-action family inet

```
user@host>clear security flow ip-action family inet
2479 ip-action entries cleared
```

clear security flow ip-action protocol udp

```
user@host>clear security flow ip-action protocol udp
270 ip-action entries cleared
```

clear security flow session family

Supported Platforms SRX Series, vSRX

Syntax clear security flow session family (inet | inet6)

Release Information Command introduced in Junos OS Release 10.2.

Description Clear sessions that match the specified protocol family.

Options

- **inet**—Clear IPv4 sessions.
- **inet6**—Clear IPv6 sessions.

Required Privilege Level clear

Related Documentation

- show security flow session family on page 223

List of Sample Output

clear security flow session family inet on page 174
clear security flow session family inet6 on page 174

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear security flow session family inet

```
user@host> clear security flow session family inet
1 active sessions cleared
```

clear security flow session family inet6

```
user@host> clear security flow session family inet6
1 active sessions cleared
```

show ethernet-switching mac-learning-log (View)

Supported Platforms SRX Series

Syntax **show ethernet-switching mac-learning-log**

Release Information Command introduced in Junos OS Release 9.5.

Description Displays the event log of learned MAC addresses.

Required Privilege Level view

Related Documentation
- show ethernet-switching table (View) on page 177

Output Fields Table 19 on page 175 lists the output fields for the show ethernet-switching mac-learning-log command. Output fields are listed in the approximate order in which they appear.

Table 19: show Ethernet Switching MAC Learning Log Output Fields

Field Name	Field Description
Date and Time	Timestamp when the MAC address was added or deleted from the log.
VLAN-IDX	VLAN index. An internal value assigned by Junos OS for each VLAN.
MAC	Learned MAC address.
Deleted | Added	MAC address deleted or added to the MAC learning log.
Blocking	The forwarding state of the interface: • blocked—Traffic is not being forwarded on the interface. • unblocked—Traffic is forwarded on the interface.

Sample Output

show ethernet-switching mac-learning-log

```
user@host> show ethernet-switching mac-learning-log
Wed Mar 18 08:07:05 2009
vlan_idx 7 mac 00:00:5E:00:53:00 was deleted
Wed Mar 18 08:07:05 2009
vlan_idx 9 mac 00:00:5E:00:53:00 was deleted
Wed Mar 18 08:07:05 2009
vlan_idx 10 mac 00:00:5E:00:53:00 was deleted
Wed Mar 18 08:07:05 2009
vlan_idx 11 mac 00:00:5E:00:53:00 was deleted
Wed Mar 18 08:07:05 2009
vlan_idx 12 mac 00:00:5E:00:53:00 was deleted
Wed Mar 18 08:07:05 2009
vlan_idx 13 mac 00:00:5E:00:53:00 was deleted
```

```
Wed Mar 18 08:07:05 2009
vlan_idx 14 mac 00:00:5E:00:53:00 was deleted
Wed Mar 18 08:07:05 2009
vlan_idx 15 mac 00:00:5E:00:53:00 was deleted
Wed Mar 18 08:07:05 2009
vlan_idx 16 mac 00:00:5E:00:53:00 was deleted
Wed Mar 18 08:07:05 2009
vlan_idx 4 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 6 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 7 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 9 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 10 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 11 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 12 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 13 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 14 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 15 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 16 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 5 mac 00:00:5E:00:53:00 was added
Wed Mar 18 08:07:05 2009
vlan_idx 18 mac 00:00:5E:00:53:AA was learned
Wed Mar 18 08:07:05 2009
vlan_idx 5 mac 00:00:5E:00:53:AB was learned
Wed Mar 18 08:07:05 2009
vlan_idx 6 mac 00:00:5E:00:53:AC was learned
Wed Mar 18 08:07:05 2009
vlan_idx 16 mac 00:00:5E:00:53:AD was learned
Wed Mar 18 08:07:05 2009
vlan_idx 7 mac 00:00:5E:00:53:AE was learned
Wed Mar 18 08:07:05 2009
vlan_idx 8 mac 00:00:5E:00:53:AF was learned
Wed Mar 18 08:07:05 2009
vlan_idx 12 mac 00:00:5E:00:53:AG was learned
[output truncated]
```

show ethernet-switching table (View)

Supported Platforms SRX Series

Syntax **show ethernet-switching table (brief |detail |extensive) interface** *interface-name*

Release Information Command introduced in Junos OS Release 9.5.

Description Displays the Ethernet switching table.

Options

- **none**—(Optional) Display brief information about the Ethernet switching table.
- **brief | detail | extensive**—(Optional) Display the specified level of output.
- **interface-name**—(Optional) Display the Ethernet switching table for a specific interface.

Required Privilege Level view

Related Documentation

- show ethernet-switching mac-learning-log (View) on page 175

Output Fields Table 20 on page 177 lists the output fields for the **show ethernet-switching table** command. Output fields are listed in the approximate order in which they appear.

Table 20: show ethernet-switching table Output Fields

Field Name	Field Description
VLAN	The name of a VLAN.
MAC address	The MAC address associated with the VLAN.
Type	The type of MAC address. Values are: • static—The MAC address is manually created. • learn—The MAC address is learned dynamically from a packet's source MAC address. • flood—The MAC address is unknown and flooded to all members.
Age	The time remaining before the entry ages out and is removed from the Ethernet switching table.
Interfaces	Interface associated with learned MAC addresses or All-members (flood entry).
Learned	For learned entries, the time which the entry was added to the Ethernet switching table.

Sample Output

show ethernet-switching table

```
user@host> show ethernet-switching table
Ethernet-switching table: 57 entries, 17 learned
VLAN MAC address Type Age Interfaces
```

```
F2 * Flood - All-members
F2 00:00:5E:00:53:AC Learn 0 ge-0/0/44.0
F2 00:00:5E:00:53:AD Static - Router
Linux * Flood - All-members
Linux 00:00:5E:00:53:AE Static - Router
Linux 00:00:5E:00:53:AF Learn 0 ge-0/0/47.0
T1 * Flood - All-members
T1 00:00:5E:00:53:AA Learn 0 ge-0/0/46.0
T1 00:00:5E:00:53:AB Static - Router
T1 00:00:5E:00:53:AC Learn 0 ge-0/0/46.0
T1 00:00:5E:00:53:AD Static - Router
T10 * Flood - All-members
T10 00:00:5E:00:53:AE Static - Router
T10 00:00:5E:00:53:AF Learn 0 ge-0/0/46.0
T10 00:00:5E:00:53:AG Static - Router
T111 * Flood - All-members
T111 00:00:5E:00:53:AH Learn 0 ge-0/0/15.0
T111 00:00:5E:00:53:AI Static - Router
T111 00:00:5E:00:53:AJ Learn 0 ge-0/0/15.0
T2 * Flood - All-members
T2 00:00:5E:00:53:AK Static - Router
T2 00:00:5E:00:53:AL Learn 0 ge-0/0/46.0
T2 00:00:5E:00:53:AM Static - Router
T3 * Flood - All-members
T3 00:00:5E:00:53:AN Static - Router
T3 00:00:5E:00:53:AO Learn 0 ge-0/0/46.0
T3 00:00:5E:00:53:AP Static - Router
T4 * Flood - All-members
T4 00:00:5E:00:53:AQ Static - Router
T4 00:00:5E:00:53:AR Learn 0 ge-0/0/46.0
[output truncated]
```

Sample Output

show ethernet-switching table brief

```
user@host> show ethernet-switching table brief
Ethernet-switching table: 57 entries, 17 learned
VLAN MAC address Type Age Interfaces
F2 * Flood - All-members
F2 00:00:5E:00:53:AC Learn 0 ge-0/0/44.0
F2 00:00:5E:00:53:AE Static - Router
Linux * Flood - All-members
Linux 00:00:5E:00:53:AA Static - Router
Linux 00:00:5E:00:53:AB Learn 0 ge-0/0/47.0
T1 * Flood - All-members
T1 00:00:5E:00:53:AC Learn 0 ge-0/0/46.0
T1 00:00:5E:00:53:AD Static - Router
T1 00:00:5E:00:53:AE Learn 0 ge-0/0/46.0
T1 00:00:5E:00:53:AF Static - Router
T10 * Flood - All-members
T10 00:00:5E:00:53:AG Static - Router
T10 00:00:5E:00:53:AH Learn 0 ge-0/0/46.0
T10 00:00:5E:00:53:AI Static - Router
T111 * Flood - All-members
T111 00:00:5E:00:53:AJ Learn 0 ge-0/0/15.0
T111 00:00:5E:00:53:AK Static - Router
T111 00:00:5E:00:53:AL Learn 0 ge-0/0/15.0
T2 * Flood - All-members
T2 00:00:5E:00:53:AM Static - Router
T2 00:00:5E:00:53:AN Learn 0 ge-0/0/46.0
```

```
T2 00:00:5E:00:53:AO Static - Router
T3 * Flood - All-members
T3 00:00:5E:00:53:AP Static - Router
T3 00:00:5E:00:53:AQ Learn 0 ge-0/0/46.0
T3 00:00:5E:00:53:AR Static - Router
T4 * Flood - All-members
T4 00:00:5E:00:53:AS Static - Router
T4 00:00:5E:00:53:AT Learn 0 ge-0/0/46.0
[output truncated]
```

Sample Output

show ethernet-switching table detail

```
user@host> show ethernet-switching table detail
Ethernet-switching table: 57 entries, 17 learned
F2, *
Interface(s): ge-0/0/44.0
Type: Flood
F2, 00:00:5E:00:53:AC
Interface(s): ge-0/0/44.0
Type: Learn, Age: 0, Learned: 2:03:09
F2, 00:00:5E:00:53:AA
Interface(s): Router
Type: Static
Linux, *
Interface(s): ge-0/0/47.0
Type: Flood
Linux, 00:00:5E:00:53:AB
Interface(s): Router
Type: Static
Linux, 00:00:5E:00:53:AC
Interface(s): ge-0/0/47.0
Type: Learn, Age: 0, Learned: 2:03:08
T1, *
Interface(s): ge-0/0/46.0
Type: Flood
T1, 00:00:5E:00:53:AD
Interface(s): ge-0/0/46.0
Type: Learn, Age: 0, Learned: 2:03:07
T1, 00:00:5E:00:53:AE
Interface(s): Router
Type: Static
T1, 00:00:5E:00:53:AF
Interface(s): ge-0/0/46.0
Type: Learn, Age: 0, Learned: 2:03:07
T1, 00:00:5E:00:53:AG
Interface(s): Router
Type: Static
T10, *
Interface(s): ge-0/0/46.0
Type: Flood
T10, 00:00:5E:00:53:AH
Interface(s): Router
Type: Static
T10, 00:00:5E:00:53:AI
Interface(s): ge-0/0/46.0
Type: Learn, Age: 0, Learned: 2:03:08
T10, 00:00:5E:00:53:AJ
Interface(s): Router
Type: Static
```

```
T111, *
Interface(s): ge-0/0/15.0
Type: Flood
[output truncated]
```

Sample Output

show ethernet-switching table extensive

```
user@host> show ethernet-switching table extensive
Ethernet-switching table: 57 entries, 17 learned
F2, *
Interface(s): ge-0/0/44.0
Type: Flood
F2, 00:00:5E:00:53:AC
Interface(s): ge-0/0/44.0
Type: Learn, Age: 0, Learned: 2:03:09
F2, 00:00:5E:00:53:AA
Interface(s): Router
Type: Static
Linux, *
Interface(s): ge-0/0/47.0
Type: Flood
Linux, 00:00:5E:00:53:AB
Interface(s): Router
Type: Static
Linux, 00:00:5E:00:53:AC
Interface(s): ge-0/0/47.0
Type: Learn, Age: 0, Learned: 2:03:08
T1, *
Interface(s): ge-0/0/46.0
Type: Flood
T1, 00:00:5E:00:53:AD
Interface(s): ge-0/0/46.0
Type: Learn, Age: 0, Learned: 2:03:07
T1, 00:00:5E:00:53:AE
Interface(s): Router
Type: Static
T1, 00:00:5E:00:53:AF
Interface(s): ge-0/0/46.0
Type: Learn, Age: 0, Learned: 2:03:07
T1, 00:00:5E:00:53:AG
Interface(s): Router
Type: Static
T10, *
Interface(s): ge-0/0/46.0
Type: Flood
T10, 00:00:5E:00:53:AH
Interface(s): Router
Type: Static
T10, 00:00:5E:00:53:AI
Interface(s): ge-0/0/46.0
Type: Learn, Age: 0, Learned: 2:03:08
T10, 00:00:5E:00:53:AJ
Interface(s): Router
Type: Static
T111, *
Interface(s): ge-0/0/15.0
Type: Flood
[output truncated]
```

Sample Output

show ethernet-switching table interface ge-0/0/1

```
user@host> show ethernet-switching table interface ge-0/0/1
Ethernet-switching table: 1 unicast entries
VLAN     MAC address         Type     Age Interfaces
V1       *                   Flood    - All-members
V1       00:00:5E:00:53:AF   Learn    0 ge-0/0/1.0
```

show interfaces (SRX Series)

Supported Platforms SRX Series, vSRX

Syntax

```
show interfaces {
  <brief | detail | extensive | terse>
  controller interface-name
  descriptions interface-name
  destination-class (all | destination-class-name logical-interface-name)
  diagnostics optics interface-name
  far-end-interval interface-fpc/pic/port
  filters interface-name
  flow-statistics interface-name
  interval interface-name
  load-balancing (detail | interface-name)
  mac-database mac-address mac-address
  mc-ae id identifier unit number revertive-info
  media interface-name
  policers interface-name
  queue both-ingress-egress egress forwarding-class forwarding-class ingress l2-statistics
  redundancy (detail | interface-name)
  routing brief detail summary interface-name
  routing-instance (all | instance-name)
  snmp-index snmp-index
  source-class (all | destination-class-name logical-interface-name)
  statistics interface-name
  switch-port switch-port number
  transport pm (all | optics | otn) (all | current | currentday | interval | previousday) (all |
    interface-name)
  zone interface-name
}
```

Release Information Command modified in Junos OS Release 9.5.

Description Display status information and statistics about interfaces on SRX Series appliance running Junos OS.

On SRX Series appliance, on configuring identical IPs on a single interface, you will not see a warning message; instead, you will see a syslog message.

Options

- **interface-name**—(Optional) Display standard information about the specified interface. Following is a list of typical interface names. Replace pim with the PIM slot and port with the port number.
  - **at-*pim*/0/*port***—ATM-over-ADSL or ATM-over-SHDSL interface.
  - **ce1-*pim*/0/ *port***—Channelized E1 interface.
  - **cl-0/0/8**—3G wireless modem interface for SRX320 devices.
  - **ct1-*pim*/0/*port***—Channelized T1 interface.
  - **dl0**—Dialer Interface for initiating ISDN and USB modem connections.
  - **e1-*pim*/0/*port***—E1 interface.

  - **e3-*pim*/0/*port***—E3 interface.
  - **fe-*pim*/0/*port***—Fast Ethernet interface.
  - **ge-*pim*/0/*port***—Gigabit Ethernet interface.
  - **se-*pim*/0/*port***—Serial interface.
  - **t1-*pim*/0/*port***—T1 (also called DS1) interface.
  - **t3-*pim*/0/*port***—T3 (also called DS3) interface.
  - **wx-*slot*/0/0**—WAN acceleration interface, for the WXC Integrated Services Module (ISM 200).

- **brief | detail | extensive | terse**—(Optional) Display the specified level of output.
- **controller**—(Optional) Show controller information.
- **descriptions**—(Optional) Display interface description strings.
- **destination-class**—(Optional) Show statistics for destination class.
- **diagnostics**—(Optional) Show interface diagnostics information.
- **far-end-interval**—(Optional) Show far end interval statistics.
- **filters**—(Optional) Show interface filters information.
- **flow-statistics**—(Optional) Show security flow counters and errors.
- **interval**—(Optional) Show interval statistics.
- **load-balancing**—(Optional) Show load-balancing status.
- **mac-database**—(Optional) Show media access control database information.
- **mc-ae**—(Optional) Show MC-AE configured interface information.
- **media**—(Optional) Display media information.
- **policers**—(Optional) Show interface policers information.
- **queue**—(Optional) Show queue statistics for this interface.
- **redundancy**—(Optional) Show redundancy status.
- **routing**—(Optional) Show routing status.
- **routing-instance**—(Optional) Name of routing instance.
- **snmp-index**—(Optional) SNMP index of interface.
- **source-class**—(Optional) Show statistics for source class.
- **statistics**—(Optional) Display statistics and detailed output.
- **switch-port**—(Optional) Front end port number (0..15).
- **transport**—(Optional) Show interface transport information.
- **zone**—(Optional) Interface's zone.

Required Privilege Level view

Related Documentation

List of Sample Output

Output Fields Table 21 on page 185 lists the output fields for the **show interfaces** command. Output fields are listed in the approximate order in which they appear.

Table 21: show interfaces Output Fields

Field Name	Field Description	Level of Output
Physical Interface		
Physical interface	Name of the physical interface.	All levels
Enabled	State of the interface.	All levels
Interface index	Index number of the physical interface, which reflects its initialization sequence.	**detail extensive** none
SNMP ifIndex	SNMP index number for the physical interface.	**detail extensive** none
Link-level type	Encapsulation being used on the physical interface.	All levels
Generation	Unique number for use by Juniper Networks technical support only.	**detail extensive**
MTU	Maximum transmission unit size on the physical interface.	All levels
Link mode	Link mode: Full-duplex or Half-duplex.	
Speed	Speed at which the interface is running.	All levels
BPDU error	Bridge protocol data unit (BPDU) error: Detected or None	
Loopback	Loopback status: **Enabled** or **Disabled**. If loopback is enabled, type of loopback: **Local** or **Remote**.	All levels
Source filtering	Source filtering status: **Enabled** or **Disabled**.	All levels
Flow control	Flow control status: **Enabled** or **Disabled**.	All levels
Auto-negotiation	(Gigabit Ethernet interfaces) Autonegotiation status: **Enabled** or **Disabled**.	All levels
Remote-fault	(Gigabit Ethernet interfaces) Remote fault status: • **Online**—Autonegotiation is manually configured as online. • **Offline**—Autonegotiation is manually configured as offline.	All levels
Device flags	Information about the physical device.	All levels
Interface flags	Information about the interface.	All levels
Link flags	Information about the physical link.	All levels
CoS queues	Number of CoS queues configured.	**detail extensive** none
Current address	Configured MAC address.	**detail extensive** none

Table 21: show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Last flapped	Date, time, and how long ago the interface went from down to up. The format is **Last flapped:** ***year-month-day hour:minute:second:timezone*** **(*hour:minute:second* ago)**. For example, **Last flapped: 2002-04-26 10:52:40 PDT (04:33:20 ago).**	**detail extensive** none
Input Rate	Input rate in bits per second (bps) and packets per second (pps).	None
Output Rate	Output rate in bps and pps.	None
Active alarms and Active defects	Ethernet-specific defects that can prevent the interface from passing packets. When a defect persists for a certain amount of time, it is promoted to an alarm. These fields can contain the value **None** or **Link**. • **None**—There are no active defects or alarms. • **Link**—Interface has lost its link state, which usually means that the cable is unplugged, the far-end system has been turned off, or the PIC is malfunctioning.	**detail extensive** none
Statistics last cleared	Time when the statistics for the interface were last set to zero.	**detail extensive**
Traffic statistics	Number and rate of bytes and packets received and transmitted on the physical interface. • **Input bytes**—Number of bytes received on the interface. • **Output bytes**—Number of bytes transmitted on the interface. • **Input packets**—Number of packets received on the interface. • **Output packets**—Number of packets transmitted on the interface.	**detail extensive**

Table 21: show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Input errors	Input errors on the interface. • **Errors**—Sum of the incoming frame aborts and FCS errors. • **Drops**—Number of packets dropped by the input queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. • **Framing errors**—Number of packets received with an invalid frame checksum (FCS). • **Runts**—Number of frames received that are smaller than the runt threshold. • **Policed discards**—Number of frames that the incoming packet match code discarded because they were not recognized or not of interest. Usually, this field reports protocols that Junos OS does not handle. • **L3 incompletes**—Number of incoming packets discarded because they failed Layer 3 (usually IPv4) sanity checks of the header. For example, a frame with less than 20 bytes of available IP header is discarded. L3 incomplete errors can be ignored by configuring the **ignore-l3-incompletes** statement. • **L2 channel errors**—Number of times the software did not find a valid logical interface for an incoming frame. • **L2 mismatch timeouts**—Number of malformed or short packets that caused the incoming packet handler to discard the frame as unreadable. • **FIFO errors**—Number of FIFO errors in the receive direction that are reported by the ASIC on the PIC. If this value is ever nonzero, the PIC is probably malfunctioning. • **Resource errors**—Sum of transmit drops.	**extensive**
Output errors	Output errors on the interface. • **Carrier transitions**—Number of times the interface has gone from **down** to **up**. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC or PIM is malfunctioning. • **Errors**—Sum of the outgoing frame aborts and FCS errors. • **Drops**—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. • **Collisions**—Number of Ethernet collisions. The Gigabit Ethernet PIC supports only full-duplex operation, so for Gigabit Ethernet PICs, this number should always remain 0. If it is nonzero, there is a software bug. • **Aged packets**—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. • **FIFO errors**—Number of FIFO errors in the send direction as reported by the ASIC on the PIC. If this value is ever nonzero, the PIC is probably malfunctioning. • **HS link CRC errors**—Number of errors on the high-speed links between the ASICs responsible for handling the interfaces. • **MTU errors**—Number of packets whose size exceeded the MTU of the interface. • **Resource errors**—Sum of transmit drops.	**extensive**

Table 21: show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Ingress queues	Total number of ingress queues supported on the specified interface.	**extensive**
Queue counters and queue number	CoS queue number and its associated user-configured forwarding class name. • **Queued packets**—Number of queued packets. • **Transmitted packets**—Number of transmitted packets. • **Dropped packets**—Number of packets dropped by the ASIC's RED mechanism.	**detail extensive**
MAC statistics	**Receive** and **Transmit** statistics reported by the PIC's MAC subsystem, including the following: • **Total octets** and **total packets**—Total number of octets and packets. • **Unicast packets, Broadcast packets,** and **Multicast packets**—Number of unicast, broadcast, and multicast packets. • **CRC/Align errors**—Total number of packets received that had a length (excluding framing bits, but including FCS octets) of between 64 and 1518 octets, inclusive, and had either a bad FCS with an integral number of octets (FCS Error) or a bad FCS with a nonintegral number of octets (Alignment Error). • **FIFO error**—Number of FIFO errors that are reported by the ASIC on the PIC. If this value is ever nonzero, the PIC or a cable is probably malfunctioning. • **MAC control frames**—Number of MAC control frames. • **MAC pause frames**—Number of MAC control frames with **pause** operational code. • **Oversized frames**—There are two possible conditions regarding the number of oversized frames: ◦ Packet length exceeds 1518 octets, or ◦ Packet length exceeds MRU • **Jabber frames**—Number of frames that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either an FCS error or an alignment error. This definition of jabber is different from the definition in IEEE-802.3 section 8.2.1.5 (10BASE5) and section 10.3.1.4 (10BASE2). These documents define jabber as the condition in which any packet exceeds 20 ms. The allowed range to detect jabber is from 20 ms to 150 ms. • **Fragment frames**—Total number of packets that were less than 64 octets in length (excluding framing bits, but including FCS octets) and had either an FCS error or an alignment error. Fragment frames normally increment because both runts (which are normal occurrences caused by collisions) and noise hits are counted. • **VLAN tagged frames**—Number of frames that are VLAN tagged. The system uses the TPID of 0x8100 in the frame to determine whether a frame is tagged or not. • **Code violations**—Number of times an event caused the PHY to indicate “Data reception error” or “invalid data symbol error.”	**extensive**

Table 21: show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Filter statistics	**Receive** and **Transmit** statistics reported by the PIC's MAC address filter subsystem. The filtering is done by the content-addressable memory (CAM) on the PIC. The filter examines a packet's source and destination MAC addresses to determine whether the packet should enter the system or be rejected. • **Input packet count**—Number of packets received from the MAC hardware that the filter processed. • **Input packet rejects**—Number of packets that the filter rejected because of either the source MAC address or the destination MAC address. • **Input DA rejects**—Number of packets that the filter rejected because the destination MAC address of the packet is not on the accept list. It is normal for this value to increment. When it increments very quickly and no traffic is entering the device from the far-end system, either there is a bad ARP entry on the far-end system, or multicast routing is not on and the far-end system is sending many multicast packets to the local device (which the router is rejecting). • **Input SA rejects**—Number of packets that the filter rejected because the source MAC address of the packet is not on the accept list. The value in this field should increment only if source MAC address filtering has been enabled. If filtering is enabled, if the value increments quickly, and if the system is not receiving traffic that it should from the far-end system, it means that the user-configured source MAC addresses for this interface are incorrect. • **Output packet count**—Number of packets that the filter has given to the MAC hardware. • **Output packet pad count**—Number of packets the filter padded to the minimum Ethernet size (60 bytes) before giving the packet to the MAC hardware. Usually, padding is done only on small ARP packets, but some very small IP packets can also require padding. If this value increments rapidly, either the system is trying to find an ARP entry for a far-end system that does not exist or it is misconfigured. • **Output packet error count**—Number of packets with an indicated error that the filter was given to transmit. These packets are usually aged packets or are the result of a bandwidth problem on the FPC hardware. On a normal system, the value of this field should not increment. • **CAM destination filters, CAM source filters**—Number of entries in the CAM dedicated to destination and source MAC address filters. There can only be up to 64 source entries. If source filtering is disabled, which is the default, the values for these fields should be 0.	**extensive**
Autonegotiation information	Information about link autonegotiation. • **Negotiation status:** ◦ **Incomplete**—Ethernet interface has the speed or link mode configured. ◦ **No autonegotiation**—Remote Ethernet interface has the speed or link mode configured, or does not perform autonegotiation. ◦ **Complete**—Ethernet interface is connected to a device that performs autonegotiation and the autonegotiation process is successful.	**extensive**
Packet Forwarding Engine configuration	Information about the configuration of the Packet Forwarding Engine: • **Destination slot**—FPC slot number.	**extensive**

Table 21: show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
CoS information	Information about the CoS queue for the physical interface. • **CoS transmit queue**—Queue number and its associated user-configured forwarding class name. • **Bandwidth %**—Percentage of bandwidth allocated to the queue. • **Bandwidth bps**—Bandwidth allocated to the queue (in bps). • **Buffer %**—Percentage of buffer space allocated to the queue. • **Buffer usec**—Amount of buffer space allocated to the queue, in microseconds. This value is nonzero only if the buffer size is configured in terms of time. • **Priority**—Queue priority: **low** or **high**. • **Limit**—Displayed if rate limiting is configured for the queue. Possible values are **none** and **exact**. If **exact** is configured, the queue transmits only up to the configured bandwidth, even if excess bandwidth is available. If **none** is configured, the queue transmits beyond the configured bandwidth if bandwidth is available.	**extensive**
Interface transmit statistics	Status of the **interface-transmit-statistics** configuration: Enabled or Disabled.	**detail extensive**
Queue counters (Egress)	CoS queue number and its associated user-configured forwarding class name. • **Queued packets**—Number of queued packets. • **Transmitted packets**—Number of transmitted packets. • **Dropped packets**—Number of packets dropped by the ASIC's RED mechanism.	**detail extensive**
Logical Interface		
Logical interface	Name of the logical interface.	All levels
Index	Index number of the logical interface, which reflects its initialization sequence.	**detail extensive** none
SNMP ifIndex	SNMP interface index number for the logical interface.	**detail extensive** none
Generation	Unique number for use by Juniper Networks technical support only.	**detail extensive**
Flags	Information about the logical interface.	All levels
Encapsulation	Encapsulation on the logical interface.	All levels
Traffic statistics	Number and rate of bytes and packets received and transmitted on the specified interface set. • **Input bytes, Output bytes**—Number of bytes received and transmitted on the interface set. The value in this field also includes the Layer 2 overhead bytes for ingress or egress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level. • **Input packets, Output packets**—Number of packets received and transmitted on the interface set.	**detail extensive**

Table 21: show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Local statistics	Number and rate of bytes and packets destined to the device.	**extensive**
Transit statistics	Number and rate of bytes and packets transiting the switch. NOTE: For Gigabit Ethernet intelligent queuing 2 (IQ2) interfaces, the logical interface egress statistics might not accurately reflect the traffic on the wire when output shaping is applied. Traffic management output shaping might drop packets after they are tallied by the **Output bytes** and **Output packets** interface counters. However, correct values display for both of these egress statistics when per-unit scheduling is enabled for the Gigabit Ethernet IQ2 physical interface, or when a single logical interface is actively using a shared scheduler.	**extensive**
Security	Security zones that interface belongs to.	**extensive**
Flow Input statistics	Statistics on packets received by flow module.	**extensive**
Flow Output statistics	Statistics on packets sent by flow module.	**extensive**
Flow error statistics (Packets dropped due to)	Statistics on errors in the flow module.	**extensive**
Protocol	Protocol family.	**detail extensive** none
MTU	Maximum transmission unit size on the logical interface.	**detail extensive** none
Generation	Unique number for use by Juniper Networks technical support only.	**detail extensive**
Route Table	Route table in which the logical interface address is located. For example, **0** refers to the routing table inet.0.	**detail extensive** none
Flags	Information about protocol family flags. .	**detail extensive**
Addresses, Flags	Information about the address flags..	**detail extensive** none
Destination	IP address of the remote side of the connection.	**detail extensive** none
Local	IP address of the logical interface.	**detail extensive** none
Broadcast	Broadcast address of the logical interface.	**detail extensive** none
Generation	Unique number for use by Juniper Networks technical support only.	**detail extensive**

Sample Output

show interfaces Gigabit Ethernet

```
user@host> show interfaces ge-0/0/1
```

```
Physical interface: ge-0/0/1, Enabled, Physical link is Down
  Interface index: 135, SNMP ifIndex: 510
  Link-level type: Ethernet, MTU: 1514, Link-mode: Full-duplex, Speed: 1000mbps,

  BPDU Error: None, MAC-REWRITE Error: None, Loopback: Disabled,
  Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled,
  Remote fault: Online
  Device flags   : Present Running Down
  Interface flags: Hardware-Down SNMP-Traps Internal: 0x0
  Link flags     : None
  CoS queues     : 8 supported, 8 maximum usable queues
  Current address: 00:1f:12:e4:b1:01, Hardware address: 00:1f:12:e4:b1:01
  Last flapped   : 2015-05-12 08:36:59 UTC (1w1d 22:42 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  Active alarms  : LINK
  Active defects : LINK
  Interface transmit statistics: Disabled

  Logical interface ge-0/0/1.0 (Index 71) (SNMP ifIndex 514)
    Flags: Device-Down SNMP-Traps 0x0 Encapsulation: ENET2
    Input packets : 0
    Output packets: 0
    Security: Zone: public
    Protocol inet, MTU: 1500
      Flags: Sendbcast-pkt-to-re
      Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
        Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255
```

Sample Output

show interfaces brief (Gigabit Ethernet)

```
user@host> show interfaces ge-3/0/2 brief
Physical interface: ge-3/0/2, Enabled, Physical link is Up
  Link-level type: 52, MTU: 1522, Speed: 1000mbps, Loopback: Disabled,
  Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled,
  Remote fault: Online
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : None

  Logical interface ge-3/0/2.0
    Flags: SNMP-Traps 0x4000
    VLAN-Tag [ 0x8100.512 0x8100.513 ] In(pop-swap 0x8100.530) Out(swap-push
    0x8100.512 0x8100.513)
    Encapsulation: VLAN-CCC
    ccc

  Logical interface ge-3/0/2.32767
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x0000.0 ]  Encapsulation: ENET2
```

Sample Output

show interfaces detail (Gigabit Ethernet)

```
user@host> show interfaces ge-0/0/1 detail
Physical interface: ge-0/0/1, Enabled, Physical link is Down
  Interface index: 135, SNMP ifIndex: 510, Generation: 138
  Link-level type: Ethernet, MTU: 1514, Link-mode: Full-duplex, Speed: 1000mbps,
 BPDU Error: None, MAC-REWRITE Error: None, Loopback: Disabled, Source filtering:
```

```
Disabled,
 Flow control: Enabled, Auto-negotiation: Enabled, Remote fault: Online
 Device flags   : Present Running Down
 Interface flags: Hardware-Down SNMP-Traps Internal: 0x0
 Link flags     : None
 CoS queues     : 8 supported, 8 maximum usable queues
 Hold-times     : Up 0 ms, Down 0 ms
 Current address: 00:1f:12:e4:b1:01, Hardware address: 00:1f:12:e4:b1:01
 Last flapped   : 2015-05-12 08:36:59 UTC (1w2d 00:00 ago)
 Statistics last cleared: Never
 Traffic statistics:
  Input  bytes  :                   0                   0 bps
  Output bytes  :                   0                   0 bps
  Input  packets:                   0                   0 pps
  Output packets:                   0                   0 pps
 Egress queues: 8 supported, 4 in use
 Queue counters:       Queued packets  Transmitted packets      Dropped packets

   0 best-effort                   0                   0                   0

   1 expedited-fo                  0                   0                   0

   2 assured-forw                  0                   0                   0

   3 network-cont                  0                   0                   0

 Queue number:         Mapped forwarding classes
   0                   best-effort
   1                   expedited-forwarding
   2                   assured-forwarding
   3                   network-control
 Active alarms  : LINK
 Active defects : LINK
 Interface transmit statistics: Disabled

 Logical interface ge-0/0/1.0 (Index 71) (SNMP ifIndex 514) (Generation 136)
   Flags: Device-Down SNMP-Traps 0x0 Encapsulation: ENET2
   Traffic statistics:
    Input  bytes  :                   0
    Output bytes  :                   0
    Input  packets:                   0
    Output packets:                   0
   Local statistics:
    Input  bytes  :                   0
    Output bytes  :                   0
    Input  packets:                   0
    Output packets:                   0
   Transit statistics:
    Input  bytes  :                   0                   0 bps
    Output bytes  :                   0                   0 bps
    Input  packets:                   0                   0 pps
    Output packets:                   0                   0 pps
   Security: Zone: public
   Flow Statistics :
   Flow Input statistics :
     Self packets :                    0
     ICMP packets :                    0
     VPN packets :                     0
     Multicast packets :               0
     Bytes permitted by policy :       0
     Connections established :         0
```

```
    Flow Output statistics:
      Multicast packets :                0
      Bytes permitted by policy :        0
    Flow error statistics (Packets dropped due to):
      Address spoofing:                  0
      Authentication failed:             0
      Incoming NAT errors:               0
      Invalid zone received packet:      0
      Multiple user authentications:     0
      Multiple incoming NAT:             0
      No parent for a gate:              0
      No one interested in self packets: 0
      No minor session:                  0
      No more sessions:                  0
      No NAT gate:                       0
      No route present:                  0
      No SA for incoming SPI:            0
      No tunnel found:                   0
      No session for a gate:             0
      No zone or NULL zone binding       0
      Policy denied:                     0
      Security association not active:   0
      TCP sequence number out of window: 0
      Syn-attack protection:             0
      User authentication errors:        0
    Protocol inet, MTU: 1500, Generation: 150, Route table: 0
      Flags: Sendbcast-pkt-to-re
      Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
        Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255, Generation:
 150
```

Sample Output

show interfaces extensive (Gigabit Ethernet)

```
user@host> show interfaces ge-0/0/1.0 extensive
Physical interface: ge-0/0/1, Enabled, Physical link is Down
  Interface index: 135, SNMP ifIndex: 510, Generation: 138
  Link-level type: Ethernet, MTU: 1514, Link-mode: Full-duplex, Speed: 1000mbps,

  BPDU Error: None, MAC-REWRITE Error: None, Loopback: Disabled,
  Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Enabled,
  Remote fault: Online
  Device flags   : Present Running Down
  Interface flags: Hardware-Down SNMP-Traps Internal: 0x0
  Link flags     : None
  CoS queues     : 8 supported, 8 maximum usable queues
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:1f:12:e4:b1:01, Hardware address: 00:1f:12:e4:b1:01
  Last flapped   : 2015-05-12 08:36:59 UTC (1w1d 22:57 ago)
  Statistics last cleared: Never
  Traffic statistics:
   Input  bytes  :                   0                   0 bps
   Output bytes  :                   0                   0 bps
   Input  packets:                   0                   0 pps
   Output packets:                   0                   0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0,
    L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
    FIFO errors: 0, Resource errors: 0
  Output errors:
```

```
    Carrier transitions: 0, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0,

    FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
  Egress queues: 8 supported, 4 in use
  Queue counters:       Queued packets  Transmitted packets      Dropped packets

    0 best-effort                    0                    0                    0

    1 expedited-fo                   0                    0                    0

    2 assured-forw                   0                    0                    0

    3 network-cont                   0                    0                    0

  Queue number:         Mapped forwarding classes
    0                   best-effort
    1                   expedited-forwarding
    2                   assured-forwarding
    3                   network-control
  Active alarms  : LINK
  Active defects : LINK
  MAC statistics:                      Receive         Transmit
    Total octets                             0                0
    Total packets                            0                0
    Unicast packets                          0                0
    Broadcast packets                        0                0
    Multicast packets                        0                0
    CRC/Align errors                         0                0
    FIFO errors                              0                0
    MAC control frames                       0                0
    MAC pause frames                         0                0
    Oversized frames                         0
    Jabber frames                            0
    Fragment frames                          0
    VLAN tagged frames                       0
    Code violations                          0
  Filter statistics:
    Input packet count                       0
    Input packet rejects                     0
    Input DA rejects                         0
    Input SA rejects                         0
    Output packet count                                       0
    Output packet pad count                                   0
    Output packet error count                                 0
    CAM destination filters: 2, CAM source filters: 0
  Autonegotiation information:
    Negotiation status: Incomplete
  Packet Forwarding Engine configuration:
    Destination slot: 0
  CoS information:
    Direction : Output
    CoS transmit queue               Bandwidth               Buffer Priority
Limit
                              %           bps     %           usec
    0 best-effort            95     950000000    95              0      low
none
    3 network-control         5      50000000     5              0      low
none
  Interface transmit statistics: Disabled

  Logical interface ge-0/0/1.0 (Index 71) (SNMP ifIndex 514) (Generation 136)
```

```
Flags: Device-Down SNMP-Traps 0x0 Encapsulation: ENET2
Traffic statistics:
 Input  bytes  :                   0
 Output bytes  :                   0
 Input  packets:                   0
 Output packets:                   0
Local statistics:
 Input  bytes  :                   0
 Output bytes  :                   0
 Input  packets:                   0
 Output packets:                   0
Transit statistics:
 Input  bytes  :                   0                   0 bps
 Output bytes  :                   0                   0 bps
 Input  packets:                   0                   0 pps
 Output packets:                   0                   0 pps
Security: Zone: public
Flow Statistics :
Flow Input statistics :
  Self packets :                    0
  ICMP packets :                    0
  VPN packets :                     0
  Multicast packets :               0
  Bytes permitted by policy :       0
  Connections established :         0
Flow Output statistics:
  Multicast packets :               0
  Bytes permitted by policy :       0
Flow error statistics (Packets dropped due to):
  Address spoofing:                 0
  Authentication failed:            0
  Incoming NAT errors:              0
  Invalid zone received packet:     0
  Multiple user authentications:    0
  Multiple incoming NAT:            0
  No parent for a gate:             0
  No one interested in self packets: 0
  No minor session:                 0
  No more sessions:                 0
  No NAT gate:                      0
  No route present:                 0
  No SA for incoming SPI:           0
  No tunnel found:                  0
  No session for a gate:            0
  No zone or NULL zone binding      0
  Policy denied:                    0
  Security association not active:  0
  TCP sequence number out of window: 0
  Syn-attack protection:            0
  User authentication errors:       0
Protocol inet, MTU: 1500, Generation: 150, Route table: 0
  Flags: Sendbcast-pkt-to-re
  Addresses, Flags: Dest-route-down Is-Preferred Is-Primary
    Destination: 1.1.1/24, Local: 1.1.1.1, Broadcast: 1.1.1.255,
    Generation: 150
```

Sample Output

show interfaces terse

```
user@host> show interfaces terse
    Interface               Admin Link Proto    Local                 Remote
    ge-0/0/0                up    up
    ge-0/0/0.0              up    up   inet     10.209.4.61/18
    gr-0/0/0                up    up
    ip-0/0/0                up    up
    st0                     up    up
    st0.1                   up    ready inet
    ls-0/0/0                up    up
    lt-0/0/0                up    up
    mt-0/0/0                up    up
    pd-0/0/0                up    up
    pe-0/0/0                up    up
    e3-1/0/0                up    up
    t3-2/0/0                up    up
    e1-3/0/0                up    up
    se-4/0/0                up    down
    t1-5/0/0                up    up
    br-6/0/0                up    up
    dc-6/0/0                up    up
    dc-6/0/0.32767          up    up
    bc-6/0/0:1              down  up
    bc-6/0/0:1.0            up    down
    dl0                     up    up
    dl0.0                   up    up   inet
    dsc                     up    up
    gre                     up    up
    ipip                    up    up
    lo0                     up    up
    lo0.16385               up    up   inet     10.0.0.1              --> 0/0
                                                 10.0.0.16             --> 0/0
    lsi                     up    up
    mtun                    up    up
    pimd                    up    up
    pime                    up    up
    pp0                     up    up
```

Sample Output

show interfaces controller (Channelized E1 IQ with Logical E1)

```
user@host> show interfaces controller ce1-1/2/6

Controller                                                      Admin Link
ce1-1/2/6                                                       up    up
e1-1/2/6                                                        up    up
```

show interfaces controller (Channelized E1 IQ with Logical DS0)

```
user@host> show interfaces controller ce1-1/2/3

Controller                                                      Admin Link
ce1-1/2/3                                                       up    up

ds-1/2/3:1                                                      up    up

ds-1/2/3:2                                                      up    up
```

Sample Output

show interfaces descriptions

```
user@host> show interfaces descriptions
 Interface       Admin Link Description
 so-1/0/0        up    up   M20-3#1
 so-2/0/0        up    up   GSR-12#1
 ge-3/0/0        up    up   SMB-OSPF_Area300
 so-3/3/0        up    up   GSR-13#1
 so-3/3/1        up    up   GSR-13#2
 ge-4/0/0        up    up   T320-7#1
 ge-5/0/0        up    up   T320-7#2
 so-7/1/0        up    up   M160-6#1
 ge-8/0/0        up    up   T320-7#3
 ge-9/0/0        up    up   T320-7#4
 so-10/0/0       up    up   M160-6#2
 so-13/0/0       up    up   M20-3#2
 so-14/0/0       up    up   GSR-12#2
 ge-15/0/0       up    up   SMB-OSPF_Area100
 ge-15/0/1       up    up   GSR-13#3
```

Sample Output

show interfaces destination-class all

```
user@host> show interfaces destination-class all
Logical interface so-4/0/0.0
                                          Packets                 Bytes
     Destination class            (packet-per-second)    (bits-per-second)
                        gold                        0                     0
                                                 (                  0) (                  0)
                      silver                        0                     0
                                                 (                  0) (                  0)
  Logical interface so-0/1/3.0
                                          Packets                 Bytes
     Destination class            (packet-per-second)    (bits-per-second)
                        gold                        0                     0
                                                 (                  0) (                  0)
                      silver                        0                     0
                                                 (                  0) (                  0)
```

Sample Output

show interfaces diagnostics optics

```
user@host> show interfaces diagnostics optics ge-2/0/0
Physical interface: ge-2/0/0
    Laser bias current                         :  7.408 mA
    Laser output power                         :  0.3500 mW / -4.56 dBm
    Module temperature                         :  23 degrees C / 73 degrees F
    Module voltage                             :  3.3450 V
    Receiver signal average optical power      :  0.0002 mW / -36.99 dBm
    Laser bias current high alarm              :  Off
    Laser bias current low alarm               :  Off
    Laser bias current high warning            :  Off
    Laser bias current low warning             :  Off
    Laser output power high alarm              :  Off
    Laser output power low alarm               :  Off
    Laser output power high warning            :  Off
    Laser output power low warning             :  Off
```

```
    Module temperature high alarm             :  Off
    Module temperature low alarm              :  Off
    Module temperature high warning           :  Off
    Module temperature low warning            :  Off
    Module voltage high alarm                 :  Off
    Module voltage low alarm                  :  Off
    Module voltage high warning               :  Off
    Module voltage low warning                :  Off
    Laser rx power high alarm                 :  Off
    Laser rx power low alarm                  :  On
    Laser rx power high warning               :  Off
    Laser rx power low warning                :  On
    Laser bias current high alarm threshold   :  17.000 mA
    Laser bias current low alarm threshold    :  1.000 mA
    Laser bias current high warning threshold :  14.000 mA
    Laser bias current low warning threshold  :  2.000 mA
    Laser output power high alarm threshold   :  0.6310 mW / -2.00 dBm
    Laser output power low alarm threshold    :  0.0670 mW / -11.74 dBm
    Laser output power high warning threshold :  0.6310 mW / -2.00 dBm
    Laser output power low warning threshold  :  0.0790 mW / -11.02 dBm
    Module temperature high alarm threshold   :  95 degrees C / 203 degrees F
    Module temperature low alarm threshold    :  -25 degrees C / -13 degrees F
    Module temperature high warning threshold :  90 degrees C / 194 degrees F
    Module temperature low warning threshold  :  -20 degrees C / -4 degrees F
    Module voltage high alarm threshold       :  3.900 V
    Module voltage low alarm threshold        :  2.700 V
    Module voltage high warning threshold     :  3.700 V
    Module voltage low warning threshold      :  2.900 V
    Laser rx power high alarm threshold       :  1.2590 mW / 1.00 dBm
    Laser rx power low alarm threshold        :  0.0100 mW / -20.00 dBm
    Laser rx power high warning threshold     :  0.7940 mW / -1.00 dBm
    Laser rx power low warning threshold      :  0.0158 mW / -18.01 dBm
```

Sample Output

show interfaces far-end-interval coc12-5/2/0

```
user@host> show interfaces far-end-interval coc12-5/2/0
Physical interface: coc12-5/2/0, SNMP ifIndex: 121
  05:30-current:
    ES-L: 1, SES-L: 1, UAS-L: 0
  05:15-05:30:
    ES-L: 0, SES-L: 0, UAS-L: 0
  05:00-05:15:
    ES-L: 0, SES-L: 0, UAS-L: 0
  04:45-05:00:
    ES-L: 0, SES-L: 0, UAS-L: 0
  04:30-04:45:
    ES-L: 0, SES-L: 0, UAS-L: 0
  04:15-04:30:
    ES-L: 0, SES-L: 0, UAS-L: 0
  04:00-04:15:
...
```

show interfaces far-end-interval coc1-5/2/1:1

```
user@host> run show interfaces far-end-interval coc1-5/2/1:1
 Physical interface: coc1-5/2/1:1, SNMP ifIndex: 342
  05:30-current:
    ES-L: 1, SES-L: 1, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0
```

```
  05:15-05:30:
    ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0
  05:00-05:15:
    ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0
  04:45-05:00:
    ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0
  04:30-04:45:
    ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0
  04:15-04:30:
    ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0, SES-P: 0, UAS-P: 0
  04:00-04:15:
```

Sample Output

show interfaces filters

```
user@host> show interfaces filters
Interface       Admin Link Proto Input Filter         Output Filter
ge-0/0/0        up    up
ge-0/0/0.0      up    up   inet
                           iso
ge-5/0/0        up    up
ge-5/0/0.0      up    up   any                        f-any
                           inet                       f-inet
                           multiservice
gr-0/3/0        up    up
ip-0/3/0        up    up
mt-0/3/0        up    up
pd-0/3/0        up    up
pe-0/3/0        up    up
vt-0/3/0        up    up
at-1/0/0        up    up
at-1/0/0.0      up    up   inet
                           iso
at-1/1/0        up    down
at-1/1/0.0      up    down inet
                           iso
....
```

Sample Output

show interfaces flow-statistics (Gigabit Ethernet)

```
user@host> show interfaces flow-statistics ge-0/0/1.0
  Logical interface ge-0/0/1.0 (Index 70) (SNMP ifIndex 49)
    Flags: SNMP-Traps Encapsulation: ENET2
    Input packets : 5161
    Output packets: 83
    Security: Zone: zone2
    Allowed host-inbound traffic : bootp bfd bgp  dns dvmrp  ldp msdp nhrp ospf
pgm
    pim rip router-discovery rsvp sap vrrp dhcp finger ftp tftp ident-reset http
 https ike
   netconf ping rlogin rpm rsh snmp snmp-trap ssh telnet traceroute xnm-clear-text
 xnm-ssl
    lsping
    Flow Statistics :
    Flow Input statistics :
      Self packets :                    0
      ICMP packets :                    0
      VPN packets :                     2564
```

```
    Bytes permitted by policy :        3478
    Connections established :          1
  Flow Output statistics:
    Multicast packets :                0
    Bytes permitted by policy :        16994
  Flow error statistics (Packets dropped due to):
    Address spoofing:                  0
    Authentication failed:             0
    Incoming NAT errors:               0
    Invalid zone received packet:      0
    Multiple user authentications:     0
    Multiple incoming NAT:             0
    No parent for a gate:              0
    No one interested in self packets: 0
    No minor session:                  0
    No more sessions:                  0
    No NAT gate:                       0
    No route present:                  0
    No SA for incoming SPI:            0
    No tunnel found:                   0
    No session for a gate:             0
    No zone or NULL zone binding       0
    Policy denied:                     0
    Security association not active:   0
    TCP sequence number out of window: 0
    Syn-attack protection:             0
    User authentication errors:        0
  Protocol inet, MTU: 1500
    Flags: None
    Addresses, Flags: Is-Preferred Is-Primary
      Destination:  203.0.113.1/24, Local: 203.0.113.2, Broadcast: 2.2.2.255
```

Sample Output

show interfaces interval (Channelized OC12)

```
user@host> show interfaces interval t3-0/3/0:0
Physical interface: t3-0/3/0:0, SNMP ifIndex: 23
  17:43-current:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  17:28-17:43:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  17:13-17:28:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  16:58-17:13:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  16:43-16:58:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
...
Interval Total:
    LCV: 230, PCV: 1145859, CCV: 455470, LES: 0, PES: 230, PSES: 230,
    CES: 230, CSES: 230, SEFS: 230, UAS: 238
```

show interfaces interval (E3)

```
user@host> show interfaces interval e3-0/3/0
```

```
Physical interface: e3-0/3/0, SNMP ifIndex: 23
  17:43-current:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  17:28-17:43:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  17:13-17:28:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  16:58-17:13:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
    SEFS: 0, UAS: 0
  16:43-16:58:
    LCV: 0, PCV: 0, CCV: 0, LES: 0, PES: 0, PSES: 0, CES: 0, CSES: 0,
....
Interval Total:
    LCV: 230, PCV: 1145859, CCV: 455470, LES: 0, PES: 230, PSES: 230,
    CES: 230, CSES: 230, SEFS: 230, UAS: 238
```

show interfaces interval (SONET/SDH)

```
user@host> show interfaces interval so-0/1/0
Physical interface: so-0/1/0, SNMP ifIndex: 19
  20:02-current:
    ES-S: 0, SES-S: 0, SEFS-S: 0, ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0,
    SES-P: 0, UAS-P: 0
  19:47-20:02:
    ES-S: 267, SES-S: 267, SEFS-S: 267, ES-L: 267, SES-L: 267, UAS-L: 267,
    ES-P: 267, SES-P: 267, UAS-P: 267
  19:32-19:47:
    ES-S: 56, SES-S: 56, SEFS-S: 56, ES-L: 56, SES-L: 56, UAS-L: 46, ES-P: 56,
    SES-P: 56, UAS-P: 46
  19:17-19:32:
    ES-S: 0, SES-S: 0, SEFS-S: 0, ES-L: 0, SES-L: 0, UAS-L: 0, ES-P: 0,
    SES-P: 0, UAS-P: 0
  19:02-19:17:
.....
```

Sample Output

show interfaces load-balancing

```
user@host> show interfaces load-balancing
Interface  State           Last change  Member count
ams0       Up              1d 00:50     2
ams1       Up              00:00:59     2
```

show interfaces load-balancing detail

```
user@host>show interfaces load-balancing detail
Load-balancing interfaces detail
Interface        : ams0
  State          : Up
  Last change    : 1d 00:51
  Member count   : 2
  Members        :
      Interface    Weight   State
      mams-2/0/0    10        Active
      mams-2/1/0    10        Active
```

Sample Output

show interfaces mac-database (All MAC Addresses on a Port)

```
user@host> show interfaces mac-database xe-0/3/3
Physical interface: xe-0/3/3, Enabled, Physical link is Up
  Interface index: 372, SNMP ifIndex: 788
  Link-level type: Ethernet, MTU: 1514, LAN-PHY mode, Speed: 10Gbps, Loopback:
None, Source filtering: Disabled, Flow control: Enabled
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : None

  Logical interface xe-0/3/3.0 (Index 364) (SNMP ifIndex 829)
    Flags: SNMP-Traps 0x4004000 Encapsulation: ENET2
  MAC address        Input frames    Input bytes  Output frames   Output bytes
  00:00:00:00:00:00             1             56              0              0
  00:00:c0:01:01:02       7023810      323095260              0              0
  00:00:c0:01:01:03       7023810      323095260              0              0
  00:00:c0:01:01:04       7023810      323095260              0              0
  00:00:c0:01:01:05       7023810      323095260              0              0
  00:00:c0:01:01:06       7023810      323095260              0              0
  00:00:c0:01:01:07       7023810      323095260              0              0
  00:00:c0:01:01:08       7023809      323095214              0              0
  00:00:c0:01:01:09       7023809      323095214              0              0
  00:00:c0:01:01:0a       7023809      323095214              0              0
  00:00:c0:01:01:0b       7023809      323095214              0              0
  00:00:c8:01:01:02      30424784     1399540064       37448598     1722635508
  00:00:c8:01:01:03      30424784     1399540064       37448598     1722635508
  00:00:c8:01:01:04      30424716     1399536936       37448523     1722632058
  00:00:c8:01:01:05      30424789     1399540294       37448598     1722635508
  00:00:c8:01:01:06      30424788     1399540248       37448597     1722635462
  00:00:c8:01:01:07      30424783     1399540018       37448597     1722635462
  00:00:c8:01:01:08      30424783     1399540018       37448596     1722635416
  00:00:c8:01:01:09       8836796      406492616        8836795      406492570
  00:00:c8:01:01:0a      30424712     1399536752       37448521     1722631966
  00:00:c8:01:01:0b      30424715     1399536890       37448523     1722632058
  Number of MAC addresses : 21
```

show interfaces mac-database (All MAC Addresses on a Service)

```
user@host> show interfaces mac-database xe-0/3/3
Logical interface xe-0/3/3.0 (Index 364) (SNMP ifIndex 829)
    Flags: SNMP-Traps 0x4004000 Encapsulation: ENET2
  MAC address        Input frames    Input bytes  Output frames   Output bytes
  00:00:00:00:00:00             1             56              0              0
  00:00:c0:01:01:02       7023810      323095260              0              0
  00:00:c0:01:01:03       7023810      323095260              0              0
  00:00:c0:01:01:04       7023810      323095260              0              0
  00:00:c0:01:01:05       7023810      323095260              0              0
  00:00:c0:01:01:06       7023810      323095260              0              0
  00:00:c0:01:01:07       7023810      323095260              0              0
  00:00:c0:01:01:08       7023809      323095214              0              0
  00:00:c0:01:01:09       7023809      323095214              0              0
  00:00:c0:01:01:0a       7023809      323095214              0              0
  00:00:c0:01:01:0b       7023809      323095214              0              0
  00:00:c8:01:01:02      31016568     1426762128       38040381     1749857526
```

```
  00:00:c8:01:01:03      31016568     1426762128       38040382     1749857572
  00:00:c8:01:01:04      31016499     1426758954       38040306     1749854076
  00:00:c8:01:01:05      31016573     1426762358       38040381     1749857526
  00:00:c8:01:01:06      31016573     1426762358       38040381     1749857526
  00:00:c8:01:01:07      31016567     1426762082       38040380     1749857480
  00:00:c8:01:01:08      31016567     1426762082       38040379     1749857434
  00:00:c8:01:01:09       9428580      433714680        9428580      433714680
  00:00:c8:01:01:0a      31016496     1426758816       38040304     1749853984
  00:00:c8:01:01:0b      31016498     1426758908       38040307     1749854122
```

show interfaces mac-database mac-address

```
user@host> show interfaces mac-database xe-0/3/3 mac-address  00:00:c8:01:01:09
Physical interface: xe-0/3/3, Enabled, Physical link is Up
  Interface index: 372, SNMP ifIndex: 788
  Link-level type: Ethernet, MTU: 1514, LAN-PHY mode, Speed: 10Gbps, Loopback:
None, Source filtering: Disabled, Flow control: Enabled
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : None

  Logical interface xe-0/3/3.0 (Index 364) (SNMP ifIndex 829)
    Flags: SNMP-Traps 0x4004000 Encapsulation: ENET2
  MAC address: 00:00:c8:01:01:09, Type: Configured,
    Input bytes     : 202324652
    Output bytes    : 202324560
    Input frames    : 4398362
    Output frames   : 4398360
  Policer statistics:
  Policer type      Discarded frames    Discarded bytes
  Output aggregate           3992386          183649756
```

Sample Output

show interfaces mc-ae

```
user@host> show interfaces mc-ae ae0 unit 512
  Member Links   : ae0
  Local Status   : active
  Peer Status    : active
  Logical Interface        : ae0.512
  Core Facing Interface : Label Ethernet Interface
  ICL-PL         : Label Ethernet Interface
```

show interfaces media (SONET/SDH)

The following example displays the output fields unique to the **show interfaces media** command for a SONET interface (with no level of output specified):

```
user@host> show interfaces media so-4/1/2
Physical interface: so-4/1/2, Enabled, Physical link is Up
  Interface index: 168, SNMP ifIndex: 495
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: OC48,
  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps 16384
  Link flags     : Keepalives
  Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
  Keepalive: Input: 1783 (00:00:00 ago), Output: 1786 (00:00:08 ago)
  LCP state: Opened
```

```
  NCP state: inet: Not-configured, inet6: Not-configured, iso: Not-configured,
  mpls: Not-configured
  CHAP state: Not-configured
  CoS queues      : 8 supported
  Last flapped    : 2005-06-15 12:14:59 PDT (04:31:29 ago)
  Input rate      : 0 bps (0 pps)
  Output rate     : 0 bps (0 pps)
  SONET alarms    : None
  SONET defects   : None
  SONET errors:
     BIP-B1: 121, BIP-B2: 916, REI-L: 0, BIP-B3: 137, REI-P: 16747, BIP-BIP2: 0
  Received path trace: routerb so-1/1/2
  Transmitted path trace: routera so-4/1/2
```

Sample Output

show interfaces policers

```
user@host> show interfaces policers
Interface       Admin Link Proto Input Policer         Output Policer
ge-0/0/0        up    up
ge-0/0/0.0      up    up   inet
                           iso
gr-0/3/0        up    up
ip-0/3/0        up    up
mt-0/3/0        up    up
pd-0/3/0        up    up
pe-0/3/0        up    up
...
so-2/0/0        up    up
so-2/0/0.0      up    up   inet  so-2/0/0.0-in-policer so-2/0/0.0-out-policer
                           iso
so-2/1/0        up    down
...
```

show interfaces policers interface-name

```
user@host> show interfaces policers so-2/1/0
Interface       Admin Link Proto Input Policer         Output Policer
so-2/1/0        up    down
so-2/1/0.0      up    down inet  so-2/1/0.0-in-policer so-2/1/0.0-out-policer
                           iso
                           inet6
```

Sample Output

show interfaces queue

The following truncated example shows the CoS queue sizes for queues 0, 1, and 3. Queue 1 has a queue buffer size (guaranteed allocated memory) of 9192 bytes.

```
user@host> show interfaces queue
Physical interface: ge-0/0/0, Enabled, Physical link is Up
  Interface index: 134, SNMP ifIndex: 509
Forwarding classes: 8 supported, 8 in use
Egress queues: 8 supported, 8 in use
Queue: 0, Forwarding classes: class0
  Queued:
    Packets              :                    0                    0 pps
    Bytes                :                    0                    0 bps
```

```
  Transmitted:
    Packets              :                    0                    0 pps
    Bytes                :                    0                    0 bps
    Tail-dropped packets :                    0                    0 pps
    RL-dropped packets   :                    0                    0 pps
    RL-dropped bytes     :                    0                    0 bps
    RED-dropped packets  :                    0                    0 pps
     Low                 :                    0                    0 pps
     Medium-low          :                    0                    0 pps
     Medium-high         :                    0                    0 pps
     High                :                    0                    0 pps
    RED-dropped bytes    :                    0                    0 bps
     Low                 :                    0                    0 bps
     Medium-low          :                    0                    0 bps
     Medium-high         :                    0                    0 bps
     High                :                    0                    0 bps
  Queue Buffer Usage:
    Reserved buffer      :            118750000 bytes
  Queue-depth bytes      :
    Current              :                    0
..
..
Queue: 1, Forwarding classes: class1
..
..
 Queue Buffer Usage:
    Reserved buffer      :                 9192 bytes
  Queue-depth bytes      :
    Current              :                    0
..
..
Queue: 3, Forwarding classes: class3
  Queued:
..
..
Queue Buffer Usage:
    Reserved buffer      :              6250000 bytes
  Queue-depth bytes      :
    Current              :                    0
..
..
```

Sample Output

show interfaces redundancy

```
user@host> show interfaces redundancy
Interface  State         Last change  Primary    Secondary  Current status
rsp0       Not present               sp-1/0/0   sp-0/2/0   both down
rsp1       On secondary  1d 23:56     sp-1/2/0   sp-0/3/0   primary down
rsp2       On primary    10:10:27     sp-1/3/0   sp-0/2/0   secondary down
rlsq0      On primary    00:06:24     lsq-0/3/0  lsq-1/0/0  both up
```

show interfaces redundancy (Aggregated Ethernet)

```
user@host> show interfaces redundancy
Interface  State           Last change  Primary      Secondary    Current status
rlsq0      On secondary     00:56:12     lsq-4/0/0    lsq-3/0/0    both up

ae0
ae1
```

```
ae2
ae3
ae4
```

show interfaces redundancy detail

```
user@host> show interfaces redundancy detail
Interface        : rlsq0
  State          : On primary
  Last change    : 00:45:47
  Primary        : lsq-0/2/0
  Secondary      : lsq-1/2/0
  Current status : both up
  Mode           : hot-standby

Interface        : rlsq0:0
  State          : On primary
  Last change    : 00:45:46
  Primary        : lsq-0/2/0:0
  Secondary      : lsq-1/2/0:0
  Current status : both up
  Mode           : warm-standby
```

Sample Output

show interfaces routing brief

```
user@host> show interfaces routing brief
Interface        State Addresses
so-5/0/3.0       Down  ISO   enabled
so-5/0/2.0       Up    MPLS  enabled
                       ISO   enabled
                       INET  192.168.2.120
                       INET  enabled
so-5/0/1.0       Up    MPLS  enabled
                       ISO   enabled
                       INET  192.168.2.130
                       INET  enabled
at-1/0/0.3       Up    CCC   enabled
at-1/0/0.2       Up    CCC   enabled
at-1/0/0.0       Up    ISO   enabled
                       INET  192.168.90.10
                       INET  enabled
lo0.0            Up    ISO   47.0005.80ff.f800.0000.0108.0001.1921.6800.5061.00
                       ISO   enabled
                       INET  127.0.0.1
fxp1.0           Up
fxp0.0           Up    INET  192.168.6.90
```

show interfaces routing detail

```
user@host> show interfaces routing detail
so-5/0/3.0
  Index: 15, Refcount: 2, State: Up <Broadcast PointToPoint Multicast> Change:<>

  Metric: 0, Up/down transitions: 0, Full-duplex
  Link layer: HDLC serial line Encapsulation: PPP Bandwidth: 155Mbps
  ISO address (null)
    State: <Broadcast PointToPoint Multicast> Change: <>
    Preference: 0 (120 down), Metric: 0, MTU: 4470 bytes
so-5/0/2.0
```

```
  Index: 14, Refcount: 7, State: <Up Broadcast PointToPoint Multicast> Change:<>

  Metric: 0, Up/down transitions: 0, Full-duplex
  Link layer: HDLC serial line Encapsulation: PPP Bandwidth: 155Mbps
  MPLS address (null)
    State: <Up Broadcast PointToPoint Multicast> Change: <>
    Preference: 0 (120 down), Metric: 0, MTU: 4458 bytes
  ISO address (null)
    State: <Up Broadcast PointToPoint Multicast> Change: <>
    Preference: 0 (120 down), Metric: 0, MTU: 4470 bytes
  INET address 192.168.2.120
    State: <Up Broadcast PointToPoint Multicast Localup> Change: <>
    Preference: 0 (120 down), Metric: 0, MTU: 4470 bytes
    Local address: 192.168.2.120
    Destination: 192.168.2.110/32
  INET address (null)
    State: <Up Broadcast PointToPoint Multicast> Change: <>
    Preference: 0 (120 down), Metric: 0, MTU: 4470 bytes
...
```

Sample Output

show interfaces routing-instance all

```
user@host> show interfaces terse routing-instance all
Interface   Admin   Link   Proto    Local             Remote Instance
at-0/0/1    up      up     inet     10.0.0.1/24
ge-0/0/0.0  up      up     inet      192.168.4.28/24          sample-a
at-0/1/0.0  up      up     inet6     fe80::a:0:0:4/64         sample-b
so-0/0/0.0  up      up     inet     10.0.0.1/32
```

Sample Output

show interfaces snmp-index

```
user@host> show interfaces snmp-index 33
Physical interface: so-2/1/1, Enabled, Physical link is Down
  Interface index: 149, SNMP ifIndex: 33
  Link-level type: PPP, MTU: 4474, Clocking: Internal, SONET mode, Speed: OC48,
  Loopback: None, FCS: 16, Payload scrambler: Enabled
  Device flags   : Present Running Down
  Interface flags: Hardware-Down Point-To-Point SNMP-Traps 16384
  Link flags     : Keepalives
  CoS queues     : 8 supported
  Last flapped   : 2005-06-15 11:45:57 PDT (05:38:43 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  SONET alarms   : LOL, PLL, LOS
  SONET defects  : LOL, PLL, LOF, LOS, SEF, AIS-L, AIS-P
```

Sample Output

show interfaces source-class all

```
user@host> show interfaces source-class all
Logical interface so-0/1/0.0
                                          Packets               Bytes
      Source class                (packet-per-second)    (bits-per-second)
                           gold              1928095            161959980
                                (                889) (            597762)
                         bronze                    0                    0
```

```
                                    (                  0) (                  0)
                             silver                    0                     0
                                    (                  0) (                  0)
  Logical interface so-0/1/3.0
                                                    Packets                 Bytes
      Source class                   (packet-per-second)    (bits-per-second)
                               gold                    0                     0
                                    (                  0) (                  0)
                             bronze                    0                     0
                                    (                  0) (                  0)
                             silver               116113               9753492
                                    (                939) (             631616)
```

Sample Output

show interfaces statistics (Fast Ethernet)

```
user@host> show interfaces fe-1/3/1 statistics
Physical interface: fe-1/3/1, Enabled, Physical link is Up
  Interface index: 144, SNMP ifIndex: 1042
  Description: ford fe-1/3/1
  Link-level type: Ethernet, MTU: 1514, Speed: 100mbps, Loopback: Disabled,
  Source filtering: Disabled, Flow control: Enabled
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  CoS queues     : 4 supported, 4 maximum usable queues
  Current address: 00:90:69:93:04:dc, Hardware address: 00:90:69:93:04:dc
  Last flapped   : 2006-04-18 03:08:59 PDT (00:01:24 ago)
  Statistics last cleared: Never
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  Input errors: 0, Output errors: 0
  Active alarms  : None
  Active defects : None
  Logical interface fe-1/3/1.0 (Index 69) (SNMP ifIndex 50)
    Flags: SNMP-Traps Encapsulation: ENET2
    Protocol inet, MTU: 1500
      Flags: Is-Primary, DCU, SCU-in
                                                    Packets                 Bytes
      Destination class              (packet-per-second)    (bits-per-second)
                               silver1                   0                     0
                                    (                  0) (                  0)
                               silver2                   0                     0
                                    (                  0) (                  0)
                               silver3                   0                     0
                                    (                  0) (                  0)
      Addresses, Flags: Is-Default Is-Preferred Is-Primary
        Destination: 10.27.245/24, Local: 10.27.245.2,
        Broadcast: 10.27.245.255
    Protocol iso, MTU: 1497
      Flags: Is-Primary
```

Sample Output

show interfaces switch-port

```
user@host# show interfaces ge-slot/0/0 switch-port port-number
Port 0, Physical link is Up
        Speed: 100mbps, Auto-negotiation: Enabled
   Statistics:                          Receive         Transmit
          Total bytes                       28437086         21792250
```

```
          Total packets                      409145           88008
          Unicast packets                      9987           83817
          Multicast packets                  145002               0
          Broadcast packets                  254156            4191
          Multiple collisions                    23              10
          FIFO/CRC/Align errors                   0               0
          MAC pause frames                        0               0
          Oversized frames                        0
          Runt frames                             0
          Jabber frames                           0
          Fragment frames                         0
          Discarded frames                        0
        Autonegotiation information:
          Negotiation status: Complete
          Link partner:
              Link mode: Full-duplex, Flow control: None, Remote fault: OK, Link
 partner Speed: 100 Mbps
          Local resolution:
              Flow control: None, Remote fault: Link OK
```

Sample Output

show interfaces transport pm

```
user@host> show interfaces transport pm all current et-0/1/0
Physical interface: et-0/1/0, SNMP ifIndex 515
  14:45-current          Elapse time:900 Seconds
  Near End       Suspect Flag:False             Reason:None
    PM                   COUNT          THRESHOLD       TCA-ENABLED     TCA-RAISED

  OTU-BBE                  0                800              No              No
  OTU-ES                   0                135              No              No
  OTU-SES                  0                90               No              No
  OTU-UAS                  427              90               No              No
  Far End        Suspect Flag:True              Reason:Unknown
    PM                   COUNT          THRESHOLD       TCA-ENABLED     TCA-RAISED

  OTU-BBE                  0                800              No              No
  OTU-ES                   0                135              No              No
  OTU-SES                  0                90               No              No
  OTU-UAS                  0                90               No              No
  Near End       Suspect Flag:False             Reason:None
    PM                   COUNT          THRESHOLD       TCA-ENABLED     TCA-RAISED

  ODU-BBE                  0                800              No              No
  ODU-ES                   0                135              No              No
  ODU-SES                  0                90               No              No
  ODU-UAS                  427              90               No              No
  Far End        Suspect Flag:True              Reason:Unknown
    PM                   COUNT          THRESHOLD       TCA-ENABLED     TCA-RAISED

  ODU-BBE                  0                800              No              No
  ODU-ES                   0                135              No              No
  ODU-SES                  0                90               No              No
  ODU-UAS                  0                90               No              No
  FEC            Suspect Flag:False             Reason:None
    PM                   COUNT          THRESHOLD       TCA-ENABLED     TCA-RAISED

  FEC-CorrectedErr         2008544300       0                NA              NA
  FEC-UncorrectedWords     0                0                NA              NA
  BER            Suspect Flag:False             Reason:None
```

```
    PM                  MIN       MAX       AVG       THRESHOLD       TCA-ENABLED
     TCA-RAISED
  BER                   3.6e-5    5.8e-5    3.6e-5     10.0e-3        No
       Yes
Physical interface: et-0/1/0, SNMP ifIndex 515
  14:45-current
  Suspect Flag:True             Reason:Object Disabled
    PM                           CURRENT   MIN       MAX      AVG       THRESHOLD
      TCA-ENABLED       TCA-RAISED
                                                                                 (MIN)
(MAX)    (MIN) (MAX)       (MIN) (MAX)
  Lane chromatic dispersion         0         0         0         0         0
 0        NA    NA         NA     NA
  Lane differential group delay     0         0         0         0         0
 0        NA    NA         NA     NA
    q Value                            120       120       120       120       0
   0        NA    NA         NA     NA
  SNR                               28        28        29        28        0
 0        NA    NA         NA     NA
  Tx output power(0.01dBm)          -5000     -5000     -5000     -5000     -300
 -100     No    No         No     No
  Rx input power(0.01dBm)           -3642     -3665     -3626     -3637     -1800
 -500     No    No         No     No
  Module temperature(Celsius)       46        46        46        46        -5
 75       No    No         No     No
  Tx laser bias current(0.1mA)      0         0         0         0         0
 0        NA    NA         NA     NA
  Rx laser bias current(0.1mA)      1270      1270      1270      1270      0
 0        NA    NA         NA     NA
  Carrier frequency offset(MHz)     -186      -186      -186      -186      -5000
 5000     No    No         No     No
```

Sample Output

show security zones

```
user@host> show security zones
Functional zone: management
   Description: This is the management zone.
   Policy configurable: No
   Interfaces bound: 1
   Interfaces:
     ge-0/0/0.0
Security zone: Host
   Description: This is the host zone.
   Send reset for non-SYN session TCP packets: Off
   Policy configurable: Yes
   Interfaces bound: 1
   Interfaces:
     fxp0.0
Security zone: abc
   Description: This is the abc zone.
   Send reset for non-SYN session TCP packets: Off
   Policy configurable: Yes
   Interfaces bound: 1
   Interfaces:
     ge-0/0/1.0
Security zone: def
   Description: This is the def zone.
   Send reset for non-SYN session TCP packets: Off
   Policy configurable: Yes
```

```
Interfaces bound: 1
Interfaces:
  ge-0/0/2.0
```

show security flow gate family

Supported Platforms SRX Series, vSRX

Syntax show security flow gate family (inet | inet6)

Release Information Command introduced in Junos OS Release 10.4.

Description Display filtered summary of information about existing gates, types of gates, and the maximum allowed number of gates.

Options
- inet—Displays IPv4 information.
- inet6—Displays IPv6 gate information.

Required Privilege Level view

Related Documentation
- *show security flow gate*

Output Fields Table 22 on page 213 lists the output fields for the **show security flow gate family** command. Output fields are listed in the approximate order in which they appear.

Table 22: show security flow gate family Output Fields

Field Name	Field Description
Valid gates	Number of valid gates.
Pending gates	Number of pending gates.
Invalidated gates	Number of invalid gates.
Gates in other states	Number of gates in other states.
Total gates	Total number of gates.

Sample Output

```
user@host> show security flow gate family inet6
Hole: 2001:13::8-0-0->2001:12::8-33135-33135

  Translated: ::/0->::/0

  Protocol: tcp

  Application: FTP ALG/79

  Age: 24 seconds

  Flags: 0x8080
```

```
  Zone: zserver

  Reference count: 1

  Resource: 1-2-2


Valid gates: 1

Pending gates: 0

Invalidated gates: 0

Gates in other states: 0

Total gates: 1
```

```
user@host> show security flow gate family inet6 destination-prefix 2001:12::8 or source-prefix
Hole: 2001:13::8-0-0->2001:12::8-33135-33135

  Translated: ::/0->::/0

  Protocol: tcp

  Application: FTP ALG/79

  Age: 26 seconds

  Flags: 0x8080

  Zone: zserver

  Reference count: 1

  Resource: 1-2-2


Valid gates: 1

Pending gates: 0

Invalidated gates: 0

Gates in other states: 0

Total gates: 1
```

show security flow ip-action

Supported Platforms SRX Series, vSRX

Syntax **show security flow ip-action** [<filter>] [summary family (inet | inet6)]

Release Information Command introduced in Junos OS Release 10.1. Logical systems option added in Junos OS Release 11.2 . Summary option introduced in Junos OS Release 12.1.

Description Display the current IP-action settings, based on filtered options, for IP sessions running on the device.

Options

- *filter*—Filter the display based on the specified criteria.

  The following filters display those sessions that match the criteria specified by the filter. Refer to the sample output for filtered output examples.

  all | [*filter*]—All active sessions on the device.

  destination-port ***destination-port***—Destination port number of the traffic. Range is 1 through 65,535.

  destination-prefix ***destination-prefix***—Destination IP prefix or address.

  family (inet | inet6) [*filter*]—IPv4 traffic or IPv6-NATPT traffic and filtered options.

  logical-system ***logical-system-name*** **| all** [*filter*]—Specified logical system or all logical systems.

  protocol ***protocol-name*** **|** ***protocol-number*** [*filter*]—Protocol name or number and filtered options.

  - **ah** or **51**
  - **egp** or **8**
  - **esp** or **50**
  - **gre** or **47**
  - **icmp** or **1**
  - **icmp6** or **58**
  - **ipip** or **4**
  - **ospf** or **89**
  - **pim** or **103**
  - **rsvp** or **46**
  - **sctp** or **132**
  - **tcp** or **6**
  - **udp** or **17**

  root-logical-system [*filter*]—Default logical system information and filtered options.

source-port *source-port*—Source port number of the traffic. Range is 1 through 65,535.

source-prefix *source-prefix*—Source IP prefix or address of the traffic.

- **summary** —Summary information about IP-action entries.

  family—Display summary of IP-action entries by family. This option is used to filter the output.

  - **inet**—Display summary of IPv4 entries.
  - **inet6**—Display summary of IPv6 entries.

Required Privilege Level view

Related Documentation

- *Juniper Networks Devices Processing Overview*
- clear security flow ip-action on page 172
- *clear security flow session destination-port*

List of Sample Output

show security flow ip-action on page 217
show security flow ip-action destination-port on page 218
show security flow ip-action destination-prefix on page 219
show security flow ip-action family inet protocol on page 219
show security flow ip-action family inet logical-system all on page 220
show security flow ip-action source-prefix on page 221
show security flow ip-action summary on page 222
show security flow ip-action summary family inet on page 222
show security flow ip-action summary family inet6 on page 222

Output Fields Table 23 on page 216 lists the output fields for the **show security flow ip-action** command. Output fields are listed in the approximate order in which they appear.

Table 23: show security flow ip-action Output Fields

Field Name	Field Description
Src-Addr	Source address of outbound IP traffic.
Src-Port	Source port number of outbound IP traffic.
Dst-Addr	Destination address of inbound IP traffic.
Dst-Port/Proto	Destination port number and protocol type of inbound IP traffic.
Timeout (sec)	Configured timeouts and time remaining for an IP session.
Zone	Security zone associated with an IP session.
Action	Configured action type, for example, block, close, and notify.
State	The active mode and passive mode describe the states of the **ip-action** entry.

Table 23: show security flow ip-action Output Fields *(continued)*

Field Name	Field Description
IPv4 action count	The total number of IPv4 entries.
IPv6 action count	The total number of IPv6 entries.

Sample Output

show security flow ip-action

```
user@host> show security flow ip-action
Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
 203.0.113.1       *       203.0.113.4         21/tcp         293/300      *
      close        Passive
 IPv4 action count: 1 on FPC0.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *      203.0.113.4          21/tcp         293/300      *
  close        Passive
 IPv4 action count: 1 on FPC0.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *      203.0.113.4          21/tcp         293/300      *
  close        Passive
 IPv4 action count: 1 on FPC0.PIC3

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *       203.0.113.4          21/tcp         293/300      *
  close        Passive
 IPv4 action count: 1 on FPC1.PIC0

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *      203.0.113.4          21/tcp         293/300       *
    close        Passive
 IPv4 action count: 1 on FPC1.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *    203.0.113.4          21/tcp         292/300      *
   close        Passive
 IPv4 action count: 1 on FPC1.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
 203.0.113.1         *    203.0.113.4          21/tcp         292/300      *
   close        Active
 IPv4 action count: 1 on FPC1.PIC3
 IPv4 action count: Active mode 1 on all PICs
 IPv6 action count: 0 on FPC0.PIC1
 IPv6 action count: 0 on FPC0.PIC2
 IPv6 action count: 0 on FPC0.PIC3
 IPv6 action count: 0 on FPC1.PIC0
```

```
 IPv6 action count: 0 on FPC1.PIC1
 IPv6 action count: 0 on FPC1.PIC2
 IPv6 action count: 0 on FPC1.PIC3
 IPv6 action count: Active mode 0 on all PICs
```

show security flow ip-action destination-port

```
user@host> show security flow ip-action destination-port 21

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         21/tcp         274/300      *
  close        Passive
 IPv4 action count: 1 on FPC0.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         21/tcp         274/300      *
 close        Passive
 IPv4 action count: 1 on FPC0.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         21/tcp         274/300      *
  close        Passive
 IPv4 action count: 1 on FPC0.PIC3

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4        21/tcp         274/300      *
  close        Passive
 IPv4 action count: 1 on FPC1.PIC0

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         21/tcp         274/300      *
  close        Passive
 IPv4 action count: 1 on FPC1.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1        *        203.0.113.4         21/tcp         274/300      *
  close        Passive
 IPv4 action count: 1 on FPC1.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         21/tcp         273/300      *
  close        Active
 IPv4 action count: 1 on FPC1.PIC3
 IPv4 action count: Active mode 1 on all PICs
 IPv6 action count: 0 on FPC0.PIC1
 IPv6 action count: 0 on FPC0.PIC2
 IPv6 action count: 0 on FPC0.PIC3
 IPv6 action count: 0 on FPC1.PIC0
 IPv6 action count: 0 on FPC1.PIC1
 IPv6 action count: 0 on FPC1.PIC2
 IPv6 action count: 0 on FPC1.PIC3
 IPv6 action count: Active mode 0 on all PICs
```

show security flow ip-action destination-prefix

```
user@host>  show security flow ip-action destination-prefix 203.0.113.4/8

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         21/tcp         245/300      *
 close        Passive
 IPv4 action count: 1 on FPC0.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         21/tcp         245/300      *
  close        Passive
 IPv4 action count: 1 on FPC0.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         21/tcp         245/300      *
 close        Passive
 IPv4 action count: 1 on FPC0.PIC3

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
192.0.2.3           *        203.0.113.4         21/tcp         245/300      *
 close        Passive
 IPv4 action count: 1 on FPC1.PIC0

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
192.0.2.3           *        203.0.113.4         21/tcp         245/300      *
 close        Passive
 IPv4 action count: 1 on FPC1.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         21/tcp         245/300      *
  close        Passive
 IPv4 action count: 1 on FPC1.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         21/tcp         245/300      *
 close        Active
 IPv4 action count: 1 on FPC1.PIC3
 IPv4 action count: Active mode 1 on all PICs
```

show security flow ip-action family inet protocol

```
user@host>  show security flow ip-action family inet protocoludp
Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         69/udp         287/300      *
        close        Passive
 IPv4 action count: 1 on FPC0.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         69/udp         287/300      *
  close        Passive
 IPv4 action count: 1 on FPC0.PIC2
```

```
Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         69/udp         287/300      *
    close        Passive
 IPv4 action count: 1 on FPC0.PIC3

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         69/udp         287/300      *
     close        Active
 IPv4 action count: 1 on FPC1.PIC0

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         69/udp         287/300      *
     close        Passive
 IPv4 action count: 1 on FPC1.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1        *        203.0.113.4         69/udp         287/300      *
    close        Passive
 IPv4 action count: 1 on FPC1.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        203.0.113.4         69/udp         287/300      *
    close        Passive
 IPv4 action count: 1 on FPC1.PIC3
 IPv4 action count: Active mode 1 on all PICs
```

show security flow ip-action family inet logical-system all

```
user@host> show security flow ip-action family inet logical-system all

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State             Logical-System
203.0.113.1         *        203.0.113.4         69/udp         267/300      *
        close        Passive           root-logical-system
 IPv4 action count: 1 on FPC0.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State             Logical-System
203.0.113.1         *        203.0.113.4         69/udp         267/300      *
 close        Passive           root-logical-system
 IPv4 action count: 1 on FPC0.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State             Logical-System
203.0.113.1         *       203.0.113.4         69/udp         267/300      *
  close        Passive           root-logical-system
 IPv4 action count: 1 on FPC0.PIC3

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State             Logical-System
203.0.113.1         *        203.0.113.4         69/udp         267/300      *
  close        Active            root-logical-system
 IPv4 action count: 1 on FPC1.PIC0

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
```

```
Action       State             Logical-System
203.0.113.1         *        203.0.113.4         69/udp         267/300      *
  close        Passive           root-logical-system
 IPv4 action count: 1 on FPC1.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State             Logical-System
203.0.113.1         *        203.0.113.4         69/udp         266/300      *
  close        Passive           root-logical-system
 IPv4 action count: 1 on FPC1.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State             Logical-System
203.0.113.1         *        203.0.113.4         69/udp         266/300      *
  close        Passive           root-logical-system
 IPv4 action count: 1 on FPC1.PIC3
 IPv4 action count: Active mode 1 on all PICs
```

show security flow ip-action source-prefix

```
user@host> show security flow ip-action source-prefix 192.0.2.3/8

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        192.0.2.4         69/udp         244/300      *
  close        Passive
 IPv4 action count: 1 on FPC0.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        192.0.2.4         69/udp         244/300      *
   close        Passive
 IPv4 action count: 1 on FPC0.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        192.0.2.4        69/udp         244/300      *
    close        Passive
 IPv4 action count: 1 on FPC0.PIC3

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        192.0.2.4         69/udp         244/300      *
     close        Active
 IPv4 action count: 1 on FPC1.PIC0

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        192.0.2.4         69/udp         244/300      *
    close        Passive
 IPv4 action count: 1 on FPC1.PIC1

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        192.0.2.4         69/udp         244/300      *
     close        Passiveo
 IPv4 action count: 1 on FPC1.PIC2

Src-Addr        Src-Port Dst-Addr        Dst-Port/Proto Timeout(sec) Zone
Action       State
203.0.113.1         *        192.0.2.4         69/udp         244/300      *
```

```
    close        Passive
 IPv4 action count: 1 on FPC1.PIC3
 IPv4 action count: Active mode 1 on all PICs
```

show security flow ip-action summary

```
user@host> show security flow ip-action summary

 IPv4 action count: 1 on FPC0.PIC1
 IPv4 action count: 1 on FPC0.PIC2
 IPv4 action count: 1 on FPC0.PIC3
 IPv4 action count: 1 on FPC1.PIC0
 IPv4 action count: 1 on FPC1.PIC1
 IPv4 action count: 1 on FPC1.PIC2
 IPv4 action count: 1 on FPC1.PIC3
 IPv4 action count: Active mode 1 on all PICs
 IPv6 action count: 0 on FPC0.PIC1
 IPv6 action count: 0 on FPC0.PIC2
 IPv6 action count: 0 on FPC0.PIC3
 IPv6 action count: 0 on FPC1.PIC0
 IPv6 action count: 0 on FPC1.PIC1
 IPv6 action count: 0 on FPC1.PIC2
 IPv6 action count: 0 on FPC1.PIC3
 IPv6 action count: Active mode 0 on all PICs
```

show security flow ip-action summary family inet

```
user@host> show security flow ip-action summary inet

 IPv4 action count: 1 on FPC0.PIC1
 IPv4 action count: 1 on FPC0.PIC2
 IPv4 action count: 1 on FPC0.PIC3
 IPv4 action count: 1 on FPC1.PIC0
 IPv4 action count: 1 on FPC1.PIC1
 IPv4 action count: 1 on FPC1.PIC2
 IPv4 action count: 1 on FPC1.PIC3
 IPv4 action count: Active mode 1 on all PICs
```

show security flow ip-action summary family inet6

```
user@host> show security flow ip-action summary family inet6

 IPv6 action count: 1 on FPC0.PIC1
 IPv6 action count: 1 on FPC0.PIC2
 IPv6 action count: 1 on FPC0.PIC3
 IPv6 action count: 1 on FPC1.PIC0
 IPv6 action count: 1 on FPC1.PIC1
 IPv6 action count: 1 on FPC1.PIC2
 IPv6 action count: 1 on FPC1.PIC3
 IPv6 action count: Active mode 1 on all PICs
```

show security flow session family

Supported Platforms SRX Series, vSRX

Syntax show security flow session family (inet | inet6)
[brief | extensive | summary]

Release Information Command introduced in Junos OS Release 10.2.

Description Display filtered summary of information about existing sessions, including types of sessions, active and failed sessions, and the maximum allowed number of sessions.

Options

- **inet**—Display details summary of IPv4 sessions.
- **inet6**—Display details summary of IPv6 sessions.
- brief | extensive | summary–Display the specified level of output.

Required Privilege Level view

Related Documentation

- *Juniper Networks Devices Processing Overview*
- clear security flow session family on page 174

List of Sample Output

show security flow session family inet on page 224
show security flow session family inet brief on page 225
show security flow session family inet extensive on page 225
show security flow session family inet summary on page 227

Output Fields Table 24 on page 223 lists the output fields for the **show security flow session family** command. Output fields are listed in the approximate order in which they appear.

Table 24: show security flow session family Output Fields

Field Name	Field Description
Session ID	Number that identifies the session. Use this ID to get more information about the session.
Policy name	Policy that permitted the traffic.
Timeout	Idle timeout after which the session expires.
In	Incoming flow (source and destination IP addresses, application protocol, interface, session token, route, gateway, tunnel, port sequence, FIN sequence, FIN state, packets and bytes).
Out	Reverse flow (source and destination IP addresses, application protocol, interface, session token, route, gateway, tunnel, port sequence, FIN sequence, FIN state, packets and bytes).
Total sessions	Total number of sessions.

Table 24: show security flow session family Output Fields *(continued)*

Field Name	Field Description
Status	Session status.
Flag	Internal flag depicting the state of the session, used for debugging purposes.
Policy name	Name and ID of the policy that the first packet of the session matched.
Source NAT pool	The name of the source pool where NAT is used.
Application	Name of the application.
Maximum timeout	Maximum session timeout.
Current timeout	Remaining time for the session unless traffic exists in the session.
Session State	Session state.
Start time	Time when the session was created, offset from the system start time.
Unicast-sessions	Number of unicast sessions.
Multicast-sessions	Number of multicast sessions.
Failed-sessions	Number of failed sessions.
Sessions-in-use	Number of sessions in use. • Valid sessions • Pending sessions • Invalidated sessions • Sessions in other states
Maximum-sessions	Number of maximum sessions.

Sample Output

show security flow session family inet

```
root> show security flow session family inet
Flow Sessions on FPC10 PIC1:
Total sessions: 0

Flow Sessions on FPC10 PIC2:

Session ID: 420000107, Policy name: default-policy-00/2, Timeout: 4, Valid
  In: 203.0.113.0/3 --> 203.0.113.5/24;icmp, If: ge-7/1/0.0, Pkts: 1, Bytes: 84,
 CP Session ID: 420000202
  Out: 203.0.113.4/24 --> 203.0.113.6/24;icmp, If: .local..0, Pkts: 1, Bytes: 84,
 CP Session ID: 420000202
Total sessions: 1
```

```
Flow Sessions on FPC10 PIC3:

Session ID: 430000115, Policy name: default-policy-00/2, Timeout: 2, Valid
  In: 203.0.113.0/4 --> 203.0.113.5/24;icmp, If: ge-7/1/0.0, Pkts: 1, Bytes: 84,
 CP Session ID: 430000110
  Out: 203.0.113.5/24 --> 203.0.113.6/24;icmp, If: .local..0, Pkts: 1, Bytes: 84,
 CP Session ID: 430000110

Session ID: 430000117, Policy name: default-policy-00/2, Timeout: 4, Valid
  In: 203.0.113.0/4 --> 203.0.113.5/24;icmp, If: ge-7/1/0.0, Pkts: 1, Bytes: 84,
 CP Session ID: 430000111
  Out: 203.0.113.5/24 --> 203.0.113.6/24;icmp, If: .local..0, Pkts: 1, Bytes: 84,
 CP Session ID: 430000111
Total sessions: 2
```

show security flow session family inet brief

```
root> show security flow session family inet brief
Flow Sessions on FPC10 PIC1:
Total sessions: 0

Flow Sessions on FPC10 PIC2:

Session ID: 420000115, Policy name: default-policy-00/2, Timeout: 2, Valid
  In: 203.0.113.0/3 --> 203.0.113.5/24;icmp, If: ge-7/1/0.0, Pkts: 1, Bytes: 84,
 CP Session ID: 420000206
  Out: 203.0.113.4/24 --> 203.0.113.6/24;icmp, If: .local..0, Pkts: 1, Bytes: 84,
 CP Session ID: 420000206

Session ID: 420000117, Policy name: default-policy-00/2, Timeout: 2, Valid
  In: 203.0.113.0/4 --> 203.0.113.5/24;icmp, If: ge-7/1/0.0, Pkts: 1, Bytes: 84,
 CP Session ID: 420000207
  Out: 203.0.113.5/24 --> 203.0.113.6/24;icmp, If: .local..0, Pkts: 1, Bytes: 84,
 CP Session ID: 420000207
Total sessions: 2

Flow Sessions on FPC10 PIC3:

Session ID: 430000119, Policy name: default-policy-00/2, Timeout: 2, Valid
  In: 203.0.113.0/4 --> 203.0.113.5/24;icmp, If: ge-7/1/0.0, Pkts: 1, Bytes: 84,
 CP Session ID: 430000112
  Out: 203.0.113.5/24 --> 203.0.113.6/24;icmp, If: .local..0, Pkts: 1, Bytes: 84,
 CP Session ID: 430000112
Total sessions: 1
```

show security flow session family inet extensive

```
root> show security flow session family inet extensive
Flow Sessions on FPC10 PIC1:

Session ID: 410000111, Status: Normal
Flags: 0x80400040/0x0/0x2800023
Policy name: default-policy-00/2
Source NAT pool: Null
Dynamic application: junos:UNKNOWN,
Encryption:  Unknown
Application traffic control rule-set: INVALID, Rule: INVALID
Maximum timeout: 4, Current timeout: 4
Session State: Valid
Start time: 76455, Duration: 0
```

```
   In: 203.0.113.0/24 --> 203.0.113.1/24;icmp,
    Interface: ge-7/1/0.0,
    Session token: 0x6, Flag: 0xc0000021
    Route: 0xa0010, Gateway: 203.0.113.10, Tunnel: 0
    Port sequence: 0, FIN sequence: 0,
    FIN state: 0,
    Pkts: 1, Bytes: 84
    CP Session ID: 410000242
   Out: 203.0.113.1/24 --> 203.0.113.10/4;icmp,
    Interface: .local..0,
    Session token: 0x2, Flag: 0x40000030
    Route: 0xfffb0006, Gateway: 203.0.113.1, Tunnel: 0
    Port sequence: 0, FIN sequence: 0,
    FIN state: 0,
    Pkts: 1, Bytes: 84
    CP Session ID: 410000242
Total sessions: 1

Flow Sessions on FPC10 PIC2:

Session ID: 420000123, Status: Normal
Flags: 0x80400040/0x0/0x2800023
Policy name: default-policy-00/2
Source NAT pool: Null
Dynamic application: junos:UNKNOWN,
Encryption:  Unknown
Application traffic control rule-set: INVALID, Rule: INVALID
Maximum timeout: 4, Current timeout: 2
Session State: Valid
Start time: 76454, Duration: 2
   In: 203.0.113.10/24 --> 203.0.113.11/24;icmp,
    Interface: ge-7/1/0.0,
    Session token: 0x6, Flag: 0xc0000021
    Route: 0xa0010, Gateway: 20010, Tunnel: 0
    Port sequence: 0, FIN sequence: 0,
    FIN state: 0,
    Pkts: 1, Bytes: 84
    CP Session ID: 420000210
   Out: 203.0.113.11/24 --> 203.0.113.12/24;icmp,
    Interface: .local..0,
    Session token: 0x2, Flag: 0x40000030
    Route: 0xfffb0006, Gateway: 203.0.113.1, Tunnel: 0
    Port sequence: 0, FIN sequence: 0,
    FIN state: 0,
    Pkts: 1, Bytes: 84
    CP Session ID: 420000210
Total sessions: 1

Flow Sessions on FPC10 PIC3:

Session ID: 430000131, Status: Normal
Flags: 0x80400040/0x0/0x2800023
Policy name: default-policy-00/2
Source NAT pool: Null
Dynamic application: junos:UNKNOWN,
Encryption:  Unknown
Application traffic control rule-set: INVALID, Rule: INVALID
Maximum timeout: 4, Current timeout: 4
Session State: Valid
Start time: 76421, Duration: 1
   In: 203.0.113.10/24 --> 203.0.113.11/24;icmp,
```



```
    Interface: ge-7/1/0.0,
    Session token: 0x6, Flag: 0xc0000021
    Route: 0xa0010, Gateway: 203.0.113.10, Tunnel: 0
    Port sequence: 0, FIN sequence: 0,
    FIN state: 0,
    Pkts: 1, Bytes: 84
    CP Session ID: 430000118
   Out: 203.0.113.12/24 --> 203.0.113.13/24;icmp,
    Interface: .local..0,
    Session token: 0x2, Flag: 0x40000030
    Route: 0xfffb0006, Gateway: 203.0.113.1, Tunnel: 0
    Port sequence: 0, FIN sequence: 0,
    FIN state: 0,
    Pkts: 1, Bytes: 84
    CP Session ID: 430000118
Total sessions: 1
```

show security flow session family inet summary

```
root> show security flow session family inet summary
Flow Sessions on FPC10 PIC1:

Valid sessions: 2
Pending sessions: 0
Invalidated sessions: 2
Sessions in other states: 0
Total sessions: 4

Flow Sessions on FPC10 PIC2:

Valid sessions: 2
Pending sessions: 0
Invalidated sessions: 2
Sessions in other states: 0
Total sessions: 4

Flow Sessions on FPC10 PIC3:

Valid sessions: 2
Pending sessions: 0
Invalidated sessions: 2
Sessions in other states: 0
Total sessions: 4
```

show security flow statistics

Supported Platforms SRX Series, vSRX

Syntax **show security flow statistics**

Release Information Command introduced in Junos OS Release 10.2.

Description Display security flow statistics on a specific SPU. A flow is a stream of related packets that meet the same matching criteria and share the same characteristics.

A packet undergoes flow-based processing after packet-based filters and some screens have been applied to it. All flow-based processing for a single flow occurs on a single System Processing Unit (SPU). An SPU processes the packets of a flow according to the security features and other services configured for the session. Flow-based packet processing treats related packets, or a stream of packets, in the same way. Packet treatment depends on characteristics that were established for the first packet of the packet stream.

The **show security flow statistics** command displays information for individual SPUs. For each SPU, it shows the number of active sessions on the SPU, the number of packets processed and forwarded, the number of packets dropped, and the number of packet fragments received in a flow on the SPU.

There are many conditions that can cause a packet to be dropped. Here are some of them:

- A screen module detects IP spoofing
- The IPSec Encapsulating Security Payload (ESP) or the Authentication Header (AH) authentication failed. For example, incoming NAT errors could cause this to happen.
- A packet matches more than one security policy that specifies user authentication. (Sometimes packets are looped through the system more than once. Each time a packet passes through the system, that packet must be permitted by a policy.)
- A time constraint setting expires. For example, multicast streams with a packet interval of more than 60 seconds would experience premature aging-out of flow sessions. (In most cases, you can configure higher time-out value to prevent packet drop.)

Packet fragmentation can occur for a number of reasons, and, in some cases, it can be controlled through a configuration setting. Every link has a maximum transmission unit (MTU) size that specifies the size of the largest packet that the link can transmit. A larger MTU size means that fewer packets are required to transmit a certain amount of data. However, for a packet to successfully traverse the path from the source node to the destination node, the MTU size of the source node interface must be no larger than that of the smallest MTU size of all nodes on the path between the source and destination. This value is referred to as the path maximum transmission unit (path MTU).

When a packet is larger that the MTU size, a link might fragment it or drop it.

- For IPv4, if a node within the path between a source node and a destination node receives a packet that is larger than its MTU size, it can fragment the packet and transmit the resulting smaller packets.
- For IPv6, an intermediate node cannot fragment a packet. If a packet is larger than a link's MTU size, it is likely that the link will drop it. However, the source node (the node that sent the packet) can fragment a packet, and this is done to accommodate a path MTU size-adjustment requirement. Nodes along the path of a packet cannot fragment the packet to transmit it.

Required Privilege Level view

Related Documentation
- *Juniper Networks Devices Processing Overview*

List of Sample Output
show security flow statistics on page 229
show security flow statistics (for hash-based datapath forwarding using SRX5K-MPC3-40G10G (IOC3) and SRX5K-MPC3-100G10G (IOC3) on page 230

Output Fields Table 25 on page 229 lists the output fields for the **show security flow statistics** command. Output fields are listed in the approximate order in which they appear.

Table 25: show security flow statistics Output Fields

Field Name	Field Description
Current sessions	Number of active sessions on the SPU.
Packets forwarded	Number of packets received in a security flow of a specific SPU. The packets are processed and forwarded on that SPU.
Packets dropped	Number of packets dropped in a flow on a specific SPU. The packets are received in the flow. However, during processing, the system discovered sanity check errors, security violations, or other conditions that caused the packet to be dropped. See the description for some of the conditions and events that can cause a packet to be dropped.
Fragment packets	Number of fragment packets received in a flow on the SPU. See the description for information on packet fragments.

Sample Output

show security flow statistics

```
root> show security flow statistics
Flow Statistics of FPC4 PIC1:
    Current sessions: 63
```

```
    Packets forwarded: 3001
    Packets dropped: 1281
    Fragment packets: 0

  Flow Statistics of FPC5 PIC0:
    Current sessions: 22
    Packets forwarded: 859
    Packets dropped: 0
    Fragment packets: 0

  Flow Statistics of FPC5 PIC1:
    Current sessions: 22
    Packets forwarded: 858
    Packets dropped: 0
    Fragment packets: 0

  Flow Statistics Summary:
    System total valid sessions: 107
    Packets forwarded: 4718
    Packets dropped: 1281
    Fragment packets: 0
```

show security flow statistics (for hash-based datapath forwarding using SRX5K-MPC3-40G10G (IOC3) and SRX5K-MPC3-100G10G (IOC3)

Starting with Junos OS Release 15.1X49-D10, SRX5K-MPC3-100G10G (IOC3) and SRX5K-MPC3-40G10G (IOC3) are introduced for SRX5400, SRX5600, and SRX5800 devices that perform hash-based datapath packet forwarding to interconnect with all existing IOC and SPC cards using the XL chip (packet-processing chip). The IOC3 XL chip uses a hash-based method to distribute ingress traffic to a pool of SPUs by default.

```
root> show security flow statistics
Flow Statistics of FPC0 PIC1:
    Current sessions: 0
    Packets forwarded: 0
    Packets dropped: 0
    Fragment packets: 0

  Flow Statistics of FPC0 PIC2:
    Current sessions: 0
    Packets forwarded: 0
    Packets dropped: 0
    Fragment packets: 0

  Flow Statistics of FPC0 PIC3:
    Current sessions: 0
    Packets forwarded: 0
    Packets dropped: 0
    Fragment packets: 0

  Flow Statistics Summary:
    System total valid sessions: 0
    Packets forwarded: 0
    Packets dropped: 0
    Fragment packets: 0
```


show security flow status

Supported Platforms SRX Series, vSRX

Syntax **show security flow status**

Release Information Command introduced in Junos OS Release 10.2; session distribution mode option added in Junos OS Release 12.1X44-D10; enhanced route scaling mode option added in Junos OS Release 12.1X45-D10. GTP-U distribution option added in Junos OS Release 15.1X49-D40.
Starting with Junos OS Release 15.1X49-D10, SRX5K-MPC3-100G10G (IOC3) and SRX5K-MPC3-40G10G (IOC3) are introduced for SRX5400, SRX5600, and SRX5800 devices that perform hash-based data path packet forwarding to interconnect with all existing IOC and SPC cards using the XL chip (packet-processing chip).
The IOC3 XL chip uses a hash-based method to distribute ingress traffic to a pool of SPUs by default. Selection of hash keys depends on application protocols.

Description Display the flow processing modes and logging status.

Required Privilege Level view

Related Documentation
- *Juniper Networks Devices Processing Overview*

List of Sample Output
show security flow status on page 232
show security flow status (IPsec Performance Acceleration) on page 232
show security flow status (for hash-based datapath forwarding using SRX5K-MPC3-40G10G (IOC3) and SRX5K-MPC3-100G10G (IOC3) on page 233

Output Fields Table 26 on page 231 lists the output fields for the **show security flow status** command. Output fields are listed in the approximate order in which they appear.

Table 26: show security flow status Output Fields

Field Name	Field Description
Flow forwarding mode	Flow processing mode. • Inet forwarding mode • Inet6 forwarding mode • MPLS forwarding mode • ISO forwarding mode • Session distribution mode • Enhanced route scaling mode
Flow trace status	Flow logging status. • Flow tracing status • Flow tracing options

Table 26: show security flow status Output Fields *(continued)*

Field Name	Field Description
flow session distribution	SPU load distribution mode. • RR-based • Hash-based GTP-U distribution • Enabled
Flow packet ordering	packet-ordering mode. • Hardware • Software
Flow ipsec performance acceleration	IPsec VPN performance acceleration status.

Sample Output

show security flow status

```
root> show security flow status
Flow forwarding mode:
Inet forwarding mode: flow based
Inet6 forwarding mode: flow based
MPLS forwarding mode: drop
ISO forwarding mode: drop
Enhanced route scaling mode: Enabled (reboot needed to disable)
Flow trace status
Flow tracing status: on
Flow tracing options: all
Flow session distribution
Distribution mode: Hash-based
GTP-U distribution: Enabled
Flow packet ordering
Ordering mode: Software (reboot needed to change to software)
```

show security flow status (IPsec Performance Acceleration)

```
root> show security flow status
Flow forwarding mode:
    Inet forwarding mode: flow based
    Inet6 forwarding mode: drop
    MPLS forwarding mode: drop
    ISO forwarding mode: drop
Flow trace status
    Flow tracing status: off
Flow session distribution
    Distribution mode: RR-based
    GTP-U distribution: Enabled Flow packet ordering
Ordering mode: Software (reboot needed to change to software)
Flow ipsec performance acceleration: on
```

show security flow status (for hash-based datapath forwarding using SRX5K-MPC3-40G10G (IOC3) and SRX5K-MPC3-100G10G (IOC3)

```
root> show security flow status
node0:
--------------------------------------------------------------------------
  Flow forwarding mode:
    Inet forwarding mode: flow based
    Inet6 forwarding mode: drop
    MPLS forwarding mode: drop
    ISO forwarding mode: drop
  Flow trace status
    Flow tracing status: off
  Flow session distribution
    Distribution mode: Hash-based
    GTP-U distribution: Enabled
  Flow ipsec performance acceleration: off
  Flow packet ordering
    Ordering mode: Hardware

node1:
--------------------------------------------------------------------------
  Flow forwarding mode:
    Inet forwarding mode: flow based
    Inet6 forwarding mode: drop
    MPLS forwarding mode: drop
    ISO forwarding mode: drop
  Flow trace status
    Flow tracing status: off
  Flow session distribution
    Distribution mode: Hash-based
    GTP-U distribution: Enabled
  Flow ipsec performance acceleration: off
  Flow packet ordering
    Ordering mode: Hardware
```

show security forward-options secure-wire

Supported Platforms SRX Series, vSRX

Syntax show security forward-options secure-wire <*secure-wire-name*>

Release Information Command introduced in Junos OS Release 12.3X48-D10.

Description Display information about secure wire mappings.

Options

- none—Display information about all configured secure wire mappings.
- *secure-wire-name*—(Optional) Display information about the specified secure wire mapping.

Required Privilege Level view

Related Documentation

- Understanding Secure Wire on page 71

List of Sample Output

show security forward-options secure-wire on page 234
show security forward-options secure-wire pw1 on page 235

Output Fields Table 27 on page 234 lists the output fields for the **show security forward-options secure-wire** command. Output fields are listed in the approximate order in which they appear.

Table 27: show security forward-options secure-wire Output Fields

Field Name	Field Description
Secure wire	Name of the secure wire mapping.
Interface	One of the peer interfaces in the secure wire mapping.
Link	Operational status of the interface link.
Interface	The second peer interface in the secure wire mapping.
Link	Operational status of the interface link.

Sample Output

show security forward-options secure-wire

```
user@host> show security forward-options secure-wire
Secure wire                    Interface       Link   Interface       Link

pw1                            ge-11/1/0.0     up     ge-11/1/1.0     up
pw2                            ge-11/0/0.0     up     ge-11/0/1.0     up
pw3                            ge-11/1/2.0     down   ge-11/1/3.0     down
Total secure wires: 3
```

Sample Output

show security forward-options secure-wire pw1

```
user@host> show security forward-options secure-wire pw1
Secure wire                    Interface       Link   Interface       Link

pw1                            ge-11/1/0.0     up     ge-11/1/1.0     up
```

show security policies

Supported Platforms SRX Series, vSRX

Syntax
show security policies
none
<**detail**>
policy-name *policy-name*
<**global**>

Release Information Command modified in Junos OS Release 9.2. Support for IPv6 addresses added in Junos OS Release 10.2. Support for wildcard addresses added in Junos OS Release 11.1. Support for global policy added in Junos OS Release 11.4. Support for services offloading added in Junos OS Release 11.4. Support for source-identities added in Junos OS Release 12.1. The **Description** output field added in Junos OS Release 12.1. Support for negated address added in Junos OS Release 12.1X45-D10. The output fields for Policy Statistics expanded, and the output fields for the **global** and **policy-name** options expanded to include from-zone and to-zone global match criteria in Junos OS Release 12.1X47-D10. Support for the **initial-tcp-mss** and **reverse-tcp-mss** options added in Junos OS Release 12.3X48-D20. Output field and description for **source-end-user-profile** option added in Junos OS Release 15.1x49-D70.

Description Display a summary of all security policies configured on the device. If a particular policy is specified, display information specific to that policy.

Options
- **none**—Display basic information about all configured policies.
- **detail**—(Optional) Display a detailed view of all of the policies configured on the device.
- **policy-name** ***policy-name***—(Optional) Display information about a specified policy.
- **global**—(Optional) Display information about global policies.

Required Privilege Level view

Related Documentation
- *Security Policies Overview*
- *Understanding Security Policy Rules*
- *Understanding Security Policy Elements*

List of Sample Output

Output Fields Table 28 on page 237 lists the output fields for the **show security policies** command. Output fields are listed in the approximate order in which they appear.

Table 28: show security policies Output Fields

Field Name	Field Description
From zone	Name of the source zone.
To zone	Name of the destination zone.
Policy	Name of the applicable policy.
Description	Description of the applicable policy.
State	Status of the policy: • **enabled**: The policy can be used in the policy lookup process, which determines access rights for a packet and the action taken in regard to it. • **disabled**: The policy cannot be used in the policy lookup process, and therefore it is not available for access control.
Index	Internal number associated with the policy.
Sequence number	Number of the policy within a given context. For example, three policies that are applicable in a from-zoneA-to-zoneB context might be ordered with sequence numbers 1, 2, 3. Also, in a from-zoneC-to-zoneD context, four policies might have sequence numbers 1, 2, 3, 4.
Source addresses	For standard display mode, the names of the source addresses for a policy. Address sets are resolved to their individual names. For detail display mode, the names and corresponding IP addresses of the source addresses for a policy. Address sets are resolved to their individual address name-IP address pairs.
Destination addresses	Name of the destination address (or address set) as it was entered in the destination zone's address book. A packet's destination address must match this value for the policy to apply to it.
source-end-user-profile	Name of the device identity profile (referred to as **end-user-profile** in the CLI) that contains attributes, or characteristics of a device. Specification of the device identity profile in the **source-end-user-profile** field is part of the device identity feature. If a device matches the attributes specified in the profile and other security policy parameters, then the security policy's action is applied to traffic issuing from the device.
Source addresses (excluded)	Name of the source address excluded from the policy.
Destination addresses (excluded)	Name of the destination address excluded from the policy.
Source identities	One or more user roles specified for a policy.

Table 28: show security policies Output Fields *(continued)*

Field Name	Field Description
Applications	Name of a preconfigured or custom application whose type the packet matches, as specified at configuration time. • **IP protocol**: The Internet protocol used by the application—for example, TCP, UDP, ICMP. • **ALG**: If an ALG is explicitly associated with the policy, the name of the ALG is displayed. If **application-protocol ignore** is configured, **ignore** is displayed. Otherwise, **0** is displayed. However, even if this command shows **ALG: 0**, ALGs might be triggered for packets destined to well-known ports on which ALGs are listening, unless ALGs are explicitly disabled or when **application-protocol ignore** is not configured for custom applications. • **Inactivity timeout**: Elapsed time without activity after which the application is terminated. • **Source port range**: The low-high source port range for the session application.
Destination Address Translation	Status of the destination address translation traffic: • **drop translated**—Drop the packets with translated destination addresses. • **drop untranslated**—Drop the packets without translated destination addresses.
Application Firewall	An application firewall includes the following: • **Rule-set**—Name of the rule set. • **Rule**—Name of the rule. ◦ **Dynamic applications**—Name of the applications. ◦ **Dynamic application groups**—Name of the application groups. ◦ **Action**—The action taken with respect to a packet that matches the application firewall rule set. Actions include the following: ▪ **permit** ▪ **deny** • **Default rule**—The default rule applied when the identified application is not specified in any rules of the rule set.
Action or Action-type	• The action taken in regard to a packet that matches the policy's tuples. Actions include the following: ◦ **permit** ◦ **firewall-authentication** ◦ **tunnel ipsec-vpn** *vpn-name* ◦ **pair-policy** *pair-policy-name* ◦ **source-nat pool** *pool-name* ◦ **pool-set** *pool-set-name* ◦ **interface** ◦ **destination-nat** *name* ◦ **deny** ◦ **reject** ◦ **services-offload**
Session log	Session log entry that indicates whether the **at-create** and **at-close** flags were set at configuration time to log session information.

Table 28: show security policies Output Fields *(continued)*

Field Name	Field Description
Scheduler name	Name of a preconfigured scheduler whose schedule determines when the policy is active and can be used as a possible match for traffic.

Policy statistics	• **Input bytes**—The total number of bytes presented for processing by the device.
	  ◦ **Initial direction**—The number of bytes presented for processing by the device from the initial direction.
	  ◦ **Reply direction**—The number of bytes presented for processing by the device from the reply direction.
	• **Output bytes**—The total number of bytes actually processed by the device.
	  ◦ **Initial direction**—The number of bytes from the initial direction actually processed by the device.
	  ◦ **Reply direction**—The number of bytes from the reply direction actually processed by the device.
	• **Input packets**—The total number of packets presented for processing by the device.
	  ◦ **Initial direction**—The number of packets presented for processing by the device from the initial direction.
	  ◦ **Reply direction**—The number of packets presented for processing by the device from the reply direction.
	• **Output packets**—The total number of packets actually processed by the device.
	  ◦ **Initial direction**—The number of packets actually processed by the device from the initial direction.
	  ◦ **Reply direction**—The number of packets actually processed by the device from the reply direction.
	• **Session rate**—The total number of active and deleted sessions.
	• **Active sessions**—The number of sessions currently present because of access control lookups that used this policy.
	• **Session deletions**—The number of sessions deleted since system startup.
	• **Policy lookups**—The number of times the policy was accessed to check for a match.

Per policy TCP Options	Configured syn and sequence checks, and the configured TCP MSS value for the initial direction and /or the reverse direction.

Sample Output

show security policies

```
user@host> show security policies
From zone: trust, To zone: untrust
  Policy: p1, State: enabled, Index: 4, Sequence number: 1
    Source addresses:
    sa-1-ipv4: 198.51.100.11/24
    sa-2-ipv6: 2001:db8:a0b:12f0::1/32
    sa-3-ipv6: 2001:db8:a0b:12f0::22/32
    sa-4-wc:   203.0.113.1/255.255.0.255
    Destination addresses:
    da-1-ipv4: 2.2.2.2/24
    da-2-ipv6: 2001:db8:a0b:12f0::8/32
    da-3-ipv6: 2001:db8:a0b:12f0::9/32
    da-4-wc:   192.168.22.11/255.255.0.255
```

```
    Source identities: role1, role2, role4
    Applications: any
    Action: permit, application services, log, scheduled
    Application firewall : my_ruleset1
  Policy: p2, State: enabled, Index: 5, Sequence number: 2
    Source addresses:
    sa-1-ipv4:  198.51.100.11/24
    sa-2-ipv6:  2001:db8:a0b:12f0::1/32
    sa-3-ipv6:  2001:db8:a0b:12f0::22/32
    Destination addresses:
    da-1-ipv4:  2.2.2.2/24
    da-2-ipv6:  2001:db8:a0b:12f0::1/32
    da-3-ipv6:  2001:db8:a0b:12f0::9/32
    Source identities: role1, role4
    Applications: any
    Action: deny, scheduled
```

show security policies policy-name detail

```
user@host> show security policies policy-name p1 detail
Policy: p1, action-type: permit, State: enabled, Index: 4
  Description: The policy p1 is for the sales team
  Sequence number: 1
  From zone: trust, To zone: untrust
  Source addresses:
    sa-1-ipv4:  198.51.100.11/24
    sa-2-ipv6:  2001:db8:a0b:12f0::1/32
    sa-3-ipv6:  2001:db8:a0b:12f0::9/32
    sa-4-wc:    203.0.113.1/255.255.0.255
  Destination addresses:
    da-1-ipv4: 192.0.2.0/24
    da-2-ipv6: 2001:db8:a0b:12f0::1/32
    da-3-ipv6: 2001:db8:a0b:12f0::9/32
    da-4-wc:   192.168.22.11/255.255.0.255
 Source identities:
  role1
  role2
  role4
  Application: any
    IP protocol: 0, ALG: 0, Inactivity timeout: 0
      Source port range: [0-0]
      Destination port range: [0-0]
  Destination Address Translation: drop translated
  Application firewall :
  Rule-set: my_ruleset1
    Rule: rule1
      Dynamic Applications: junos:FACEBOOK, junos:YSMG
      Dynamic Application groups: junos:web, junos:chat
      Action: deny
    Default rule: permit
  Session log: at-create, at-close
  Scheduler name: sch20
  Per policy TCP Options: SYN check: No, SEQ check: No
  Policy statistics:
    Input  bytes       :               18144                 545 bps
      Initial direction:                9072                272 bps
      Reply direction  :                9072                 272 bps
    Output bytes       :               18144                 545 bps
      Initial direction:                9072                 272 bps
      Reply direction  :                9072                 272 bps
    Input  packets     :                 216                   6 pps
```

```
    Initial direction:                108                    3 bps
    Reply direction  :                108                    3 bps
  Output packets     :                216                    6 pps
    Initial direction:                108                    3 bps
    Reply direction  :                108                    3 bps
  Session rate       :                108                    3 sps
  Active sessions    :                 93
  Session deletions  :                 15
  Policy lookups     :                108
```

show security policies (Services-Offload)

```
user@host> show security policies
Default policy: deny-all
From zone: trust, To zone: untrust
  Policy: p1, State: enabled, Index: 4, Scope Policy: 0, Sequence number: 1
    Source addresses: any
    Destination addresses: any
    Source identities: role1, role2, role4
    Applications: any
    Action: permit, services-offload, count
From zone: untrust, To zone: trust
  Policy: p2, State: enabled, Index: 5, Scope Policy: 0, Sequence number: 1
    Source addresses: any
    Destination addresses: any
    Source identities: role1, role2, role4
    Applications: any
    Action: permit, services-offload
```

show security policies (Device Identity)

```
user@host>  show security policies
From zone: trust, To zone: untrust
       Policy: dev-id-marketing, State: enabled, Index: 5, Scope Policy: 0,
Sequence number: 1
         Source addresses: any
         Destination addresses: any
         source-end-user-profile: marketing-profile
         Applications: any
         Action: permit
```

show security policies detail

```
user@host> show security policies detail
Default policy: deny-all
Policy: p1, action-type: permit, services-offload:enabled , State: enabled, Index:
 4, Scope Policy: 0
  Policy Type: Configured
  Description: The policy p1 is for the sales team
  Sequence number: 1
  From zone: trust, To zone: untrust
  Source addresses:
    any-ipv4(global):  0.0.0.0/0
    any-ipv6(global): ::/0
  Destination addresses:
    any-ipv4(global):  0.0.0.0/0
    any-ipv6(global): ::/0
 Source identities:
  role1
  role2
  role4
  Application: any
```

```
    IP protocol: 0, ALG: 0, Inactivity timeout: 0
      Source port range: [0-0]
      Destination port range: [0-0]
  Per policy TCP Options: SYN check: No, SEQ check: No
  Policy statistics:
    Input  bytes       :               18144                 545 bps
      Initial direction:                9072                272 bps
      Reply direction  :                9072                272 bps
    Output bytes       :               18144                 545 bps
      Initial direction:                9072                272 bps
      Reply direction  :                9072                272 bps
    Input  packets     :                 216                   6 pps
      Initial direction:                 108                   3 bps
      Reply direction  :                 108                   3 bps
    Output packets     :                 216                   6 pps
      Initial direction:                 108                   3 bps
      Reply direction  :                 108                   3 bps
    Session rate       :                 108                   3 sps
    Active sessions    :                  93
    Session deletions  :                  15
    Policy lookups     :                 108
Policy: p2, action-type: permit, services-offload:enabled , State: enabled, Index:
 5, Scope Policy: 0
  Policy Type: Configured
  Description: The policy p2 is for the sales team
  Sequence number: 1
  From zone: untrust, To zone: trust
  Source addresses:
    any-ipv4(global):  0.0.0.0/0
    any-ipv6(global): ::/0
  Destination addresses:
    any-ipv4(global):  0.0.0.0/0
    any-ipv6(global): ::/0
 Source identities:
  role1
  role2
  role4
  Application: any
    IP protocol: 0, ALG: 0, Inactivity timeout: 0
      Source port range: [0-0]
      Destination port range: [0-0]
  Per policy TCP Options: SYN check: No, SEQ check: No
```

show security policies detail (TCP Options)

```
user@host> show security policies policy-name policy1 detail
node0:
--------------------------------------------------------------------------
Policy: policy1, action-type: permit, State: enabled, Index: 7, Scope Policy: 0
  Policy Type: Configured
  Sequence number: 2
  From zone: trust, To zone: untrust
  Source addresses:
    any-ipv4(global):  0.0.0.0/0
    any-ipv6(global): ::/0
  Destination addresses:
    any-ipv4(global):  0.0.0.0/0
    any-ipv6(global): ::/0
  Application: any
    IP protocol: 0, ALG: 0, Inactivity timeout: 0
      Source port range: [0-0]
```

```
    Destination port range: [0-0]
  Per policy TCP Options: SYN check: No, SEQ check: No
  Per policy TCP MSS: initial: 800, reverse: 900
```

show security policies policy-name (Negated Address)

```
user@host> show security policies policy-name p1
node0:
--------------------------------------------------------------------------
From zone: trust, To zone: untrust
  Policy: p1, State: enabled, Index: 4, Scope Policy: 0, Sequence number: 1
    Source addresses(excluded): as1
    Destination addresses(excluded): as2
    Applications: any
    Action: permit
```

show security policies policy-name detail (Negated Address)

```
user@host> show security policies policy-name p1 detail
node0:
--------------------------------------------------------------------------
Policy: p1, action-type: permit, State: enabled, Index: 4, Scope Policy: 0
  Policy Type: Configured
  Sequence number: 1
  From zone: trust, To zone: untrust
  Source addresses(excluded):
    ad1(ad): 255.255.255.255/32
    ad2(ad):  198.51.100.1/24
    ad3(ad):  198.51.100.6  ~ 198.51.100.56
    ad4(ad):  192.0.2.8/24
    ad5(ad):  198.51.100.99 ~ 198.51.100.199
    ad6(ad):  203.0.113.9/24
    ad7(ad):  203.0.113.23/24
  Destination addresses(excluded):
    ad13(ad2): 198.51.100.76/24
    ad12(ad2): 198.51.100.88/24
    ad11(ad2): 192.0.2.23 ~ 192.0.2.66
    ad10(ad2): 192.0.2.93
    ad9(ad2):  203.0.113.76 ~ 203.0.113.106
    ad8(ad2):  203.0.113.199
  Application: any
    IP protocol: 0, ALG: 0, Inactivity timeout: 0
      Source port range: [0-0]
      Destination port range: [0-0]
  Per policy TCP Options: SYN check: No, SEQ check: No
```

show security policies global

```
user@host> show security policies global policy-name Pa
node0:
--------------------------------------------------------------------------
  Global policies:
  Policy: Pa, State: enabled, Index: 5, Scope Policy: 0, Sequence number: 1
    From zones: zone1, zone2
    To zones: zone3, zone4    Source addresses: any
    Destination addresses: any
    Applications: any
    Action: permit
```

show security zones

Supported Platforms SRX Series, vSRX

Syntax
show security zones
<detail | terse>
< *zone-name* >

Release Information Command introduced in Junos OS Release 8.5. The **Description** output field added in Junos OS Release 12.1.

Description Display information about security zones.

Options
- none—Display information about all zones.
- **detail | terse**—(Optional) Display the specified level of output.
- ***zone-name*** —(Optional) Display information about the specified zone.

Required Privilege Level view

Related Documentation
- *Security Zones and Interfaces Overview*
- *Supported System Services for Host Inbound Traffic*
- security-zone on page 159

List of Sample Output
show security zones on page 245
show security zones abc on page 245
show security zones abc detail on page 245
show security zones terse on page 246

Output Fields Table 29 on page 244 lists the output fields for the **show security zones** command. Output fields are listed in the approximate order in which they appear.

Table 29: show security zones Output Fields

Field Name	Field Description
Security zone	Name of the security zone.
Description	Description of the security zone.
Policy configurable	Whether the policy can be configured or not.
Interfaces bound	Number of interfaces in the zone.
Interfaces	List of the interfaces in the zone.
Zone	Name of the zone.

Table 29: show security zones Output Fields *(continued)*

Field Name	Field Description
Type	Type of the zone.

Sample Output

show security zones

```
user@host> show security zones
Functional zone: management
   Description: This is the management zone.
   Policy configurable: No
   Interfaces bound: 1
   Interfaces:
     ge-0/0/0.0
Security zone: Host
   Description: This is the host zone.
   Send reset for non-SYN session TCP packets: Off
   Policy configurable: Yes
   Interfaces bound: 1
   Interfaces:
     fxp0.0
Security zone: abc
   Description: This is the abc zone.
   Send reset for non-SYN session TCP packets: Off
   Policy configurable: Yes
   Interfaces bound: 1
   Interfaces:
     ge-0/0/1.0
Security zone: def
   Description: This is the def zone.
   Send reset for non-SYN session TCP packets: Off
   Policy configurable: Yes
   Interfaces bound: 1
   Interfaces:
     ge-0/0/2.0
```

Sample Output

show security zones abc

```
user@host> show security zones abc
Security zone: abc
   Description: This is the abc zone.
   Send reset for non-SYN session TCP packets: Off
   Policy configurable: Yes
   Interfaces bound: 1
   Interfaces:
     ge-0/0/1.0
```

Sample Output

show security zones abc detail

```
user@host> show security zones abc detail
Security zone: abc
   Description: This is the abc zone.
```

```
Send reset for non-SYN session TCP packets: Off
Policy configurable: Yes
Interfaces bound: 1
Interfaces:
  ge-0/0/1.0
```

Sample Output

show security zones terse

```
user@host> show security zones terse
Zone                     Type
my-internal              Security
my-external              Security
dmz                      Security
```

show vlans

Supported Platforms SRX Series, vSRX

Syntax
show vlans
<brief | detail | extensive>
<interface *interface-name*>
<logical-system (*logical-system* | *all*)>
<operational>

Release Information Command introduced in Junos OS Release 8.4.

Description Display VLAN information.

Options
none—Display information for all VLANs.

brief | detail | extensive—(Optional) Display the specified level of output.

interface *interface-name*— (Optional) Display information about a specific interface.

logical system—(Optional) Display name of the logical system or all.

operational—(Optional) Display information for the operational switching instances.

Required Privilege Level view

Related Documentation
- show ethernet-switching mac-learning-log (View) on page 175
- show ethernet-switching table (View) on page 177

List of Sample Output

Sample Output

show vlans

```
user@host> show vlans
Routing instance        VLAN name             Tag          Interfaces
default-switch          vlan-22                 22
default-switch          vlan-333                333
                                                             ge-0/0/3.0*
                                                             ge-0/0/4.0*
default-switch          default               1
default-switch          vlan100               100
                                                             ge-0/0/1.0*
```

show vlans brief

```
user@host> show vlans brief
```

```
Routing instance        VLAN name             Tag          Interfaces
default-switch          vlan-22                 22
default-switch          vlan-333                333
                                                             ge-0/0/3.0*
                                                             ge-0/0/4.0*
default-switch          default               1
default-switch          vlan100               100
                                                             ge-0/0/1.0*
```

show vlans detail

```
user@host> show vlans detail
Routing instance: default-switch
  VLAN Name: vlan-22                            State: Active
Tag: 22
Internal index: 2, Generation Index: 1, Origin: Static
MAC aging time: 300 seconds
VXLAN Enabled : No
Number of interfaces: Tagged 0    , Untagged 0
Total MAC count: 0

Routing instance: default-switch
  VLAN Name: vlan-333                           State: Active
Tag: 333
Internal index: 3, Generation Index: 2, Origin: Static
MAC aging time: 300 seconds
VXLAN Enabled : No
Interfaces:
    ge-0/0/3.0*,tagged,trunk
    ge-0/0/4.0*,tagged,trunk
Number of interfaces: Tagged 2    , Untagged 0
Total MAC count: 0
```