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Junos® OS Dynamic VLANs Feature Guide
14.1

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Documentation and Release Notes

To obtain the most current version of all Juniper Networks® technical documentation, see the product documentation page on the Juniper Networks website at http://www.juniper.net/techpubs/.

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Juniper Networks Books publishes books by Juniper Networks engineers and subject matter experts. These books go beyond the technical documentation to explore the nuances of network architecture, deployment, and administration. The current list can be viewed at http://www.juniper.net/books.

Supported Platforms

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

- MX Series

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 the *CLI User Guide*.

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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Requesting Technical Support

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- 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.
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- 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

- Dynamic VLANs in Subscriber Access Networks on page 3
- Agent Circuit Identifier-Based Dynamic VLANs in Subscriber Access Networks on page 9
- VXLANs on page 17

CHAPTER 1

Dynamic VLANs in Subscriber Access Networks

- Dynamic 802.1Q VLAN Overview on page 3
- Ethernet OAM Support for Service VLANs Overview on page 4

Dynamic 802.1Q VLAN Overview

You can identify VLANs statically or dynamically. You can also configure a mix of static and dynamic VLANs on the same underlying interface.

For Ethernet, Fast Ethernet, Tri-Rate Ethernet copper, Gigabit Ethernet, 10-Gigabit Ethernet, and aggregated Ethernet interfaces supporting VPLS, the Junos OS supports a subset of the IEEE 802.1Q standard for channelizing an Ethernet interface into multiple logical interfaces. Many hosts can be connected to the same Gigabit Ethernet switch, but they cannot be in the same routing or bridging domain.

To identify VLANs statically, you can reference a static VLAN interface in a dynamic profile. To identify subscribers dynamically, you use a variable to specify an 802.1Q VLAN that is dynamically created when a subscriber accesses the network.

Static VLAN Configuration

Static VLAN configuration is not described in this topic. For information about how to statically configure VLANs and stacked VLANs, see *Static Subscriber Interfaces and VLAN Overview*. For an example of how to configure static VLANs in a subscriber access network, see *Configuring a Subscriber Interface with a Static VLAN Interface*.

Dynamic VLAN Configuration

You can configure the router to dynamically create VLANs when a client accesses an interface and requests a VLAN ID that does not yet exist. When a client accesses a particular interface, the router instantiates a VLAN dynamic profile that you have associated with the interface. Using the settings in the dynamic profile, the router extracts information about the client from the incoming packet (for example, the interface and unit values), saves this information in the routing table, and creates a VLAN or stacked VLAN ID for the client from a range of VLAN IDs that you configure for the interface.

NOTE: Dynamic VLAN configuration supports the creation of IPv4 (inet), DHCPv4, IPv6 (inet6), and DHCPv6 VLANs.

Dynamically configuring VLANs or stacked VLANs requires the following general steps:

1. Configure a dynamic profile for dynamic VLAN or dynamic stacked VLAN creation.

   See "Configuring VLAN Dynamic Profiles" on page 24.

2. Associate the VLAN or stacked VLAN dynamic profile with the interface.

   See "Configuring VLAN Interfaces to Use Dynamic Profiles" on page 38.

3. Specify the Ethernet packet type that the VLAN dynamic profile accepts.

   See "Configuring Which VLAN Ethernet Packet Types Dynamic Profiles Can Accept" on page 40.

4. Define VLAN ranges for use by the dynamic profile when creating VLAN IDs.

   See "Configuring VLAN Ranges for Use with Dynamic Profiles" on page 44.

Ethernet OAM Support for Service VLANs Overview

You can enable propagation of the Ethernet IEEE 802.1ag Operation, Administration, and Maintenance (OAM) state of a static single-tagged service VLAN (S-VLAN) to a dynamic or static double-tagged customer VLAN (C-VLAN) and, by extension, to the subscriber interfaces configured on the C-VLAN. The static S-VLAN logical interface must be configured on a Gigabit Ethernet, 10-Gigabit Ethernet, or aggregated Ethernet physical interface.

Propagation of the S-VLAN OAM state to associated C-VLANs ensures that when the OAM state of the S-VLAN link is down, the associated C-VLANs and all subscriber interfaces configured on the C-VLANs are brought down as well.

- Ethernet OAM Support for Service VLANs Terms and Acronyms on page 4
- Components of Ethernet OAM Support for Service VLANs on page 5
- How Ethernet OAM Support for Service VLANs Works on page 6
- Restrictions for Using Ethernet OAM Support for Service VLANs on page 6

Ethernet OAM Support for Service VLANs Terms and Acronyms

Table 3 on page 4 defines the basic terms and acronyms used in this discussion of Ethernet OAM support for service VLANs.

Table 3: Ethernet OAM Support for Service VLANs Terms and Acronyms

Term	Definition
CFM	Connectivity fault management. Provides end-to-end monitoring of an Ethernet network that can be made up of one or more service instances. Junos OS supports Ethernet IEEE 802.1ag CFM.

Table 3: Ethernet OAM Support for Service VLANs Terms and Acronyms *(continued)*

Term	Definition
Continuity check protocol	A feature of Ethernet IEEE 802.1ag CFM that provides fault detection within a maintenance association.
C-VLAN	Customer VLAN. A dynamic or static double-tagged logical interface that has both an outer VLAN tag (corresponding to the S-VLAN) and an inner VLAN tag (corresponding to the C-VLAN). In a 1:1 subscriber network access model, dedicated C-VLANs provide a one-to-one correspondence between an individual subscriber and the VLAN encapsulation.
OAM	Operation, Administration, and Maintenance. A set of Ethernet connectivity specifications and functions providing connectivity monitoring, fault detection and notification, fault verification, fault isolation, loopback, and remote defect identification. Ethernet interfaces on MX Series routers support the IEEE 802.1ag standard for OAM.
S-VLAN	Service VLAN. A static single-tagged logical interface that has only one outer VLAN tag (corresponding to the S-VLAN). In an N:1 subscriber network access model, S-VLANs are dedicated to a particular service, such as video, voice, or data, instead of to a particular subscriber. Because an S-VLAN is typically shared by many subscribers within the same household or in different households, it provides a many-to-one correspondence between individual subscribers and the VLAN encapsulation.
VLAN	Virtual local area network. A logical group of network devices that appear to be on the same local area network, regardless of their physical location.

Components of Ethernet OAM Support for Service VLANs

Ethernet OAM support for S-VLANs involves the following components:

- Physical interface—On MX Series routers with Modular Port Concentrator/Modular Interface Card (MPC/MIC) interfaces, you can enable propagation of the S-VLAN OAM state to a C-VLAN on Gigabit Ethernet, 10-Gigabit Ethernet, or aggregated Ethernet physical interfaces.
- S-VLAN—To enable propagation of the S-VLAN Ethernet OAM state to associated C-VLANs and subscriber interfaces, you must configure the static single-tagged S-VLAN logical interface to run the Ethernet IEEE 802.1ag CFM continuity check protocol.
- C-VLAN—The C-VLAN is a dynamic or static double-tagged logical interface that has the same S-VLAN (outer) tag as the static single-tagged S-VLAN logical interface. If propagation of the S-VLAN OAM state to the C-VLAN is enabled on the physical interface, the router brings down the C-VLAN and its associated subscriber interfaces when the CFM continuity check protocol detects that the OAM state of the underlying S-VLAN is down.
- Subscriber interfaces—Propagation of the S-VLAN Ethernet OAM state to associated C-VLANs and subscriber interfaces applies to all dynamic or static DHCP, IP demultiplexing (IP demux), and PPPoE subscriber interfaces configured on the C-VLAN.

How Ethernet OAM Support for Service VLANs Works

To enable propagation of the Ethernet OAM state of the S-VLAN to associated C-VLANs and subscriber interfaces, use the **oam-on-svlan** statement when you configure a Gigabit Ethernet (ge), 10-Gigabit Ethernet (xe), or aggregated Ethernet (ae) physical interface.

If Ethernet IEEE 802.1ag CFM is properly configured on the S-VLAN logical interface, including the **oam-on-svlan** statement for these Ethernet interfaces causes the router to bring down both of the following when the CFM continuity check protocol detects that the OAM state of the S-VLAN logical interface is down:

- All dynamic or static double-tagged C-VLAN logical interfaces that have the same S-VLAN (outer) tag as the S-VLAN logical interface on which they are configured.
- All dynamic or static DHCP, IP demux, and PPPoE logical subscriber interfaces configured on the associated C-VLANs.

To illustrate how Ethernet OAM support for S-VLANs works, consider the following sample configuration on a Gigabit Ethernet physical interface:

- Gigabit Ethernet physical interface ge-1/0/3 configured with the **svlan-on-oam** statement.
- Static single-tagged S-VLAN logical interface ge-1/0/3.0, which has a single S-VLAN outer tag, VLAN ID 600.
- Ethernet OAM CFM protocol configured on the static S-VLAN logical interface. The CFM configuration includes an action profile with the **interface-down** default action to bring down the C-VLAN and dynamic subscriber interfaces when the continuity check protocol detects that the Ethernet OAM state of S-VLAN interface ge-1/0/3.0 is down.
- Static double-tagged C-VLAN logical interface ge-1/0/3.100, which has an S-VLAN outer tag, VLAN ID 600, and a C-VLAN inner tag, VLAN ID 1.
- Static PPPoE subscriber interfaces configured on C-VLAN interface ge-1/0/3.100.

Because the S-VLAN and C-VLAN logical interfaces in this example have the same S-VLAN outer tag (VLAN ID 600), the router brings down the C-VLAN interface and the PPPoE logical subscriber interfaces when the CFM continuity check detects that the OAM status of S-VLAN interface ge-1/0/3.0 is down.

Restrictions for Using Ethernet OAM Support for Service VLANs

Ethernet OAM support for S-VLANs is *not currently supported* for use with any of the following:

- Dynamically configured S-VLAN logical interfaces
- S-VLAN trunk interfaces
- C-VLAN trunk interfaces

Related Documentation

- Configuring Ethernet OAM Support for Service VLANs with Double-Tagged Customer VLANs on page 59

- *IEEE 802.1ag OAM Connectivity Fault Management Overview*

CHAPTER 2

Agent Circuit Identifier-Based Dynamic VLANs in Subscriber Access Networks

- Agent Circuit Identifier-Based Dynamic VLANs Overview on page 9
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- Restrictions for Configuring Adjustment of CoS Shaping Rate and Overhead Accounting for Dynamic ACI Interface Sets on page 16

Agent Circuit Identifier-Based Dynamic VLANs Overview

You can configure the router to create dynamic virtual LAN (VLAN) subscriber interfaces for Dynamic Host Configuration Protocol (DHCP) and Point-to-Point Protocol over Ethernet (PPPoE) subscribers based on agent circuit identifier (ACI) information. To use ACI-based dynamic VLAN subscriber interfaces, you must configure them on Modular Port Concentrators/Modular Interface Cards (MPCs/MICs) that face the access side of the network in an MX Series router.

This overview covers the following topics:

- VLAN Architectures and Subscriber Identification on page 9
- ACI-Based Dynamic VLANs and Agent Circuit Identifier Interface Sets on page 10

VLAN Architectures and Subscriber Identification

The following VLAN architectures defined in the DSL Forum Technical Report (TR)-101, Migration to Ethernet-Based DSL Aggregation (April 2006), use different methods to uniquely identify subscribers in Ethernet-based subscriber access networks:

- 1:1 access model using customer VLANs

  Configurations that use the 1:1 access model uniquely identify subscribers by means of VLAN encapsulation; that is, by using the VLAN ID and stacked VLAN (S-VLAN) ID. Subscriber packets received from the access node (such as a digital subscriber line access multiplexer, or DSLAM) that are either single-tagged with a VLAN ID or double-tagged with both an S-VLAN ID and a VLAN ID are examples of 1:1 VLAN

configurations because they provide a one-to-one correspondence between an individual subscriber and the VLAN encapsulation.

In the 1:1 VLAN architecture, each customer premises equipment (CPE) or subscriber network has its own dedicated Layer 2 path to the router. Each subscriber network is separated by a customer VLAN (C-VLAN) that is dedicated to a particular customer. The services for each customer are transmitted from the router to the access node by means of that customer's C-VLAN.

The ability to uniquely identify subscribers by means of VLAN encapsulation facilitates delivery of services such as authentication, authorization, and accounting (AAA); class of service (CoS); and filters (policers) to subscribers in a 1:1 VLAN configuration.

- N:1 access model using service VLANs

  Configurations that use the N:1 access model do not uniquely identify subscribers by means of VLAN encapsulation. Instead, these configurations identify subscribers by means of the agent circuit identifier (ACI) information present in DHCP and PPPoE control packets. Subscriber packets received from the access node that are either single-tagged with the same VLAN ID for a group of subscribers or untagged are examples of N:1 VLAN configurations because they provide a many-to-one correspondence between individual subscribers and the VLAN encapsulation.

  In the N:1 VLAN architecture, a service such as video, voice, or data is typically routed to a particular VLAN instead of having multiple services share a single VLAN, as is the case with the 1:1 VLAN architecture. Such VLANs, often referred to as service VLANs, enable service providers to route different services to different routers to functionally separate network services and reduce network complexity.

  Because a VLAN in an N:1 configuration corresponds to a service rather than an individual subscriber, the router uses ACI information in DHCP and PPPoE control packets instead of VLAN encapsulation to uniquely identify subscribers and facilitate application of subscriber-based services.

ACI-Based Dynamic VLANs and Agent Circuit Identifier Interface Sets

For single-tagged, double-tagged, or untagged N:1 configurations that do not use VLAN encapsulation to uniquely identify subscribers, you can configure the router to create dynamic VLAN subscriber interfaces for DHCP and PPPoE subscribers based on ACI information. ACI-based dynamic VLANs uniquely identify subscribers on the router and facilitate application of subscriber-based services, such as CoS and interface-shared filters, to all subscribers that originate from a single household and share the same ACI information.

When you configure an ACI-based dynamic VLAN, the router examines the DHCP and PPPoE control packets to extract the ACI information in order to build a unique dynamic VLAN subscriber interface. The agent-circuit-identifier value is a string that uniquely identifies the subscriber's access node and the digital subscriber line (DSL) on the access node. For DHCP traffic, the agent-circuit-identifier string is in the DHCP option 82 field of DHCP messages. For PPPoE traffic, the agent-circuit-identifier string is in the DSL Forum Agent-Circuit-ID VSA [26-1] of PPPoE Active Discovery Initiation (PADI) and PPPoE Active Discovery Request (PADR) control packets.

Configuring ACI-based dynamic VLAN subscriber interfaces is particularly useful in configurations with multiple DHCP and PPPoE subscriber sessions per household. Because DHCP and PPPoE control traffic sent to the router from the same household has the same unique agent-circuit-identifier string, the router groups these DHCP and PPPoE subscriber interfaces in the same ACI interface set. An *ACI interface set* is a logical collection of subscriber interfaces that originate at the same household or on the same access-loop port. Grouping subscriber interfaces into ACI interface sets enables unique subscriber identification and facilitates application of subscriber-based services, such as class of service (CoS) and interface-shared filters, on a per-household basis.

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155
- Clearing Agent Circuit Identifier Interface Sets on page 156

Agent Circuit Identifier-Based Dynamic VLANs Components Overview

You can configure ACI-based dynamic VLAN subscriber interfaces on Modular Port Concentrators/Modular Interface Cards (MPCs/MICs) that face the access side of the network in an MX Series router.

This overview describes the components of an ACI-based dynamic VLAN configuration, from top to bottom of the interface stack:

- ACI-Based Dynamic Subscriber Interface on page 11
- Dynamic ACI Interface Set on page 11
- Dynamic or Static Underlying VLAN Interface on page 12
- Static Physical Interface on page 12

ACI-Based Dynamic Subscriber Interface

You must create a dynamic profile to define either a dynamic PPPoE subscriber interface for PPPoE subscriber sessions, or a dynamic IP demultiplexer (IP demux) subscriber interface for DHCP subscriber sessions. The router automatically creates (instantiates) the subscriber interface when a DHCP or PPPoE subscriber logs in on the associated underlying VLAN interface associated with the dynamic profile that defines the ACI interface set.

Dynamic ACI Interface Set

The dynamic ACI interface set, which is the primary component of an ACI-based dynamic VLAN configuration, groups the DHCP and PPPoE subscriber sessions that belong to a particular household and share a common unique agent-circuit-identifier value. The router creates one ACI interface set per household to facilitate application of subscriber-based services, such as CoS and interface-shared filters, to all subscribers in the household.

You must create a dynamic profile to define the ACI interface set, which is represented in the profile by the Junos OS predefined dynamic variable **$junos-interface-set-name**. When a DHCP or PPPoE subscriber accesses the router on a particular interface, the router obtains the agent-circuit-identifier information from the DHCP or PPPoE control packets transmitted on that interface and dynamically creates the ACI interface set when the first subscriber from that household logs in.

Dynamic or Static Underlying VLAN Interface

After you define the ACI interface set, you must configure the underlying VLAN interface to enable creation of dynamic VLAN subscriber interfaces based on ACI information. You can configure the underlying VLAN interface either dynamically (with a dynamic profile) or statically.

ACI-based dynamic VLAN configurations support the following underlying VLAN interface types:

- Gigabit Ethernet
- 10-Gigabit Ethernet
- VLAN demux (demux0)

NOTE: When you configure an underlying VLAN interface to support creation of ACI-based dynamic VLANs, we recommend that you use this underlying interface only for subscriber interfaces that contain agent-circuit-identifier information in their DHCP or PPPoE control packets. If the router receives DHCP or PPPoE control packets without agent-circuit-identifier information on an underlying VLAN interface configured for ACI-based dynamic VLANs, the associated subscriber interfaces might not instantiate successfully.

Static Physical Interface

ACI-based dynamic VLAN configurations support the following physical interface types:

- Gigabit Ethernet
- 10-Gigabit Ethernet
- Aggregated Ethernet

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Overview on page 9
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155
- Clearing Agent Circuit Identifier Interface Sets on page 156

Agent Circuit Identifier-Based Dynamic VLANs Bandwidth Management Overview

A router in a subscriber access network ensures class of service (CoS) for dynamic subscriber interfaces. An MX Series router with Modular Port Concentrator/Modular Interface Card (MPC/MIC) interfaces ensures that subscribers receive an adequate minimum bandwidth, referred to as the *guaranteed rate*, and maximum bandwidth, referred to as the *shaping rate*. For dynamic VLAN subscriber interfaces based on agent circuit identifier (ACI) information, you can shape the bandwidth either at a per-household level for a dynamic ACI interface set, or at a per-subscriber level for a dynamic VLAN subscriber interface associated with an ACI interface set.

To help you manage bandwidth more efficiently and economically for ACI-based dynamic VLAN subscriber interfaces for PPPoE subscribers, you can configure the router to use specific PPPoE vendor-specific attributes (VSAs) found in PPPoE control packets to adjust the CoS shaping-rate and overhead-accounting attributes for dynamic ACI interface sets and their associated ACI-based dynamic VLAN subscriber interfaces.

This overview covers the following topics:

- CoS Shaping Rate Adjustment on page 13
- CoS Overhead Accounting Adjustment on page 14
- Dynamic Profiles and Adjustment of CoS Shaping Rate and Overhead Accounting on page 14
- Guidelines for Configuring Adjustment of CoS Shaping Rate and Overhead Accounting on page 15

CoS Shaping Rate Adjustment

The CoS shaping rate adjustment is based on the value of the Actual-Data-Rate-Downstream DSL Forum VSA [26-130] found in PPPoE Active Discovery Initiation (PADI) and PPPoE Active Discovery Request (PADR) control packets for PPPoE traffic. The Actual-Data-Rate-Downstream VSA contains the actual downstream data rate, in bits per second, of the subscriber's synchronized digital subscriber line (DSL) link.

To configure the router to use the Actual-Data-Rate-Downstream VSA to adjust the CoS shaping-rate attribute, include the **vendor-specific-tags** statement with the **actual-data-rate-downstream** option at the **[edit dynamic-profiles *profile-name* class-of-service dynamic-class-of-service-options]** hierarchy level in either the dynamic profile that defines the ACI interface set or the dynamic profile that configures the associated dynamic PPPoE (**pp0**) subscriber interface.

When you enable this feature, the value of the Actual-Data-Rate-Downstream VSA overrides the **shaping-rate** value configured at the **[edit dynamic-profiles *profile-name* class-of-service traffic-control-profiles]** hierarchy level only if the Actual-Data-Rate-Downstream VSA value is less than the **shaping-rate** value configured with the CLI.

CoS Overhead Accounting Adjustment

The CoS overhead accounting adjustment is based on the value of the Access-Loop-Encapsulation DSL Forum VSA [26-144] found in PADI and PADR control packets for PPPoE traffic. The Access-Loop-Encapsulation VSA identifies the encapsulation used by the subscriber associated with the digital subscriber line access multiplexer (DSLAM) access loop from which requests are initiated.

The value of the Data Link subfield in the Access-Loop-Encapsulation VSA determines the overhead accounting mode in use on the access loop. If the Data Link subfield value is 0 (ATM Adaptation Layer 5, or AAL5), the access loop uses cell-mode encapsulation. If the Data Link subfield value is 1 (Ethernet), the access loop uses frame-mode encapsulation.

In subscriber access networks where the router passes downstream ATM traffic to Ethernet interfaces, the different Layer 2 encapsulations between the router and the PPPoE Intermediate Agent on the DSLAM make managing the bandwidth of downstream ATM traffic difficult. Using the Access-Loop-Encapsulation VSA to shape traffic based on frames or cells enables the router to adjust the overhead-accounting attribute in order to apply the correct downstream rate for the subscriber.

To configure the router to use the Access-Loop-Encapsulation VSA to adjust the CoS overhead-accounting attribute, include the **vendor-specific-tags** statement with the **access-loop-encapsulation** option at the **[edit dynamic-profiles *profile-name* class-of-service dynamic-class-of-service-options]** hierarchy level in either the dynamic profile that defines the ACI interface set or the dynamic profile that configures the associated dynamic PPPoE (**pp0**) subscriber interface.

When you enable this feature, the value of the Access-Loop-Encapsulation VSA always overrides the **overhead-accounting** value configured at the **[edit dynamic-profiles *profile-name* class-of-service traffic-control-profiles]** hierarchy level.

Dynamic Profiles and Adjustment of CoS Shaping Rate and Overhead Accounting

When you configure the router to use one or both of the Actual-Data-Rate-Downstream VSA value and Access-Loop-Encapsulation VSA value to adjust the CoS shaping rate and overhead accounting attributes, respectively, the router adjusts these attributes when the dynamic ACI interface set is created and the router receives the PADI and PADR packets from the first subscriber interface belonging to the ACI interface set.

You can configure CoS adjustment based on either or both VSAs in either or both of the following dynamic profiles:

- To configure adjustment of the CoS shaping rate and overhead accounting on a per-household basis, use the dynamic profile that defines the dynamic ACI interface set.
- To configure adjustment of the CoS shaping rate and overhead accounting on a per-subscriber basis, use the dynamic profile that defines the ACI-based dynamic PPPoE (**pp0**) subscriber interface associated with the ACI interface set.

Table 4 on page 15 summarizes how the dynamic profile in which you configure CoS adjustment for ACI-based dynamic VLANs using one or both VSAs affects the router behavior.

Table 4: CoS Adjustment in Dynamic Profiles for ACI Interface Sets and ACI-Based Subscriber Interfaces

VSAs Specified in ACI Interface Set Dynamic Profile	VSAs Specified in PPPoE Subscriber Interface Dynamic Profile	Result
Yes	No	Router adjusts specified CoS attributes only for dynamic ACI interface set
No	Yes	Router adjusts specified CoS attributes only for ACI-based dynamic PPPoE subscriber interface
Yes	Yes	Router adjusts specified CoS attributes for both dynamic ACI interface set and ACI-based dynamic PPPoE subscriber interface
No	No	Router does not adjust CoS attributes for either the dynamic ACI interface set or the ACI-based dynamic PPPoE subscriber interface

Guidelines for Configuring Adjustment of CoS Shaping Rate and Overhead Accounting

You can also configure the router to use the Actual-Data-Rate-Downstream VSA and Access-Loop-Encapsulation VSA values in PPPoE control packets to adjust the CoS shaping rate and overhead accounting attributes, respectively, for dynamic subscriber interfaces *not* associated with dynamic ACI interface sets.

With the exception of the constraints described in "Restrictions for Configuring Adjustment of CoS Shaping Rate and Overhead Accounting for Dynamic ACI Interface Sets" on page 16, most of the guidelines and restrictions that apply to this feature for use with non–ACI-based dynamic subscriber interfaces also apply to its use for dynamic ACI interface sets and their associated ACI-based dynamic VLAN subscriber interfaces.

Related Documentation

- *Setting Class-of-Service Parameters Using PPPoE Vendor-Specific Tags*
- Adjusting the CoS Shaping Rate and Overhead Accounting Parameters for Agent Circuit Identifier-Based Dynamic VLANs on page 82
- Restrictions for Configuring Adjustment of CoS Shaping Rate and Overhead Accounting for Dynamic ACI Interface Sets on page 16

Restrictions for Configuring Adjustment of CoS Shaping Rate and Overhead Accounting for Dynamic ACI Interface Sets

The following restrictions apply when you configure the router to use the Actual-Data-Rate-Downstream VSA and Access-Loop-Encapsulation vendor-specific attribute (VSA) values in PPPoE control packets to adjust the CoS shaping rate and overhead accounting attributes, respectively, for dynamic ACI interface sets and their associated agent circuit identifier (ACI)-based dynamic VLAN subscriber interfaces:

- You cannot configure adjustment of CoS shaping rate and overhead accounting attributes based on Actual-Data-Rate-Downstream VSA and Access-Loop-Encapsulation VSA values that the router receives from the following sources:
  - RADIUS servers
  - Access Node Control Protocol (ANCP) access loop information
  - Dynamic Host Configuration Protocol (DHCP) discovery packets
- You cannot use this feature to report information about the PPPoE VSA values to RADIUS.
- You cannot use this feature to configure CoS adjustment of upstream data traffic on a dynamic ACI interface set.

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Bandwidth Management Overview on page 13
- *Setting Class-of-Service Parameters Using PPPoE Vendor-Specific Tags*
- Adjusting the CoS Shaping Rate and Overhead Accounting Parameters for Agent Circuit Identifier-Based Dynamic VLANs on page 82

CHAPTER 3

VXLANs

- Understanding VXLANs on page 17

Understanding VXLANs

- VXLAN Benefits on page 17
- What is a VXLAN? on page 18
- Using an MX Series Routers as a VTEP on page 18
- Load Balancing VXLAN Traffic on page 18
- Configure Multicast Protocols on page 19

VXLAN Benefits

Virtual Extensible Local Area Network (VXLAN) is a technology that allows you to segment your networks (as VLANs do) but that also solves the scaling limitation of VLANs and provides benefits that VLANs cannot. Here are the most important benefits of using VXLANs:

- You can theoretically create as many as 16 million VXLANs in an administrative domain (as opposed to 4094 VLANs on a Juniper Networks device). MX Series routers support as many as 32K VXLANs. This means that VXLANs provide network segmentation at the scale required by cloud builders to support very large numbers of tenants.
- You can enable migration of virtual machines between servers that exist in separate Layer 2 domains by tunneling the traffic over Layer 3 networks. This functionality allows you to dynamically allocate resources within or between data centers without being constrained by Layer 2 boundaries or being forced to create large or geographically stretched Layer 2 domains.

Using VXLANs to create smaller Layer 2 domains that are connected over a Layer 3 network means that you don't need to use STP to converge the topology but can use more-robust routing protocols in the Layer 3 network instead. In the absence of STP, none of your links are blocked, which means you can get full value from all the ports that you purchase. Using routing protocols to connect your Layer 2 domains also allows you to load balance the traffic to ensure that you get the best use of your available bandwidth. Given the amount of east-west traffic that often flows within or between data centers, maximizing your network performance for that traffic is very important.

What is a VXLAN?

VXLAN is often described as an overlay technology because it allows you to stretch Layer 2 connections over an intervening Layer 3 network by encapsulating (tunneling) Ethernet frames in a VXLAN packet that includes IP addresses. The devices that encapsulate traffic that must be transported over a VXLAN and de-encapsulate traffic when it must leave the VXLAN tunnel are virtual tunnel endpoints (VTEPs), which can be end hosts or network switches or routers. To encapsulate an Ethernet frame, VTEPs add a number of fields, including the following:

- Outer MAC destination address (MAC address of the tunnel endpoint VTEP)
- Outer MAC source address (MAC address of the tunnel source VTEP)
- Outer IP destination address (IP address of the tunnel endpoint VTEP)
- Outer IP source address (IP address of the tunnel source VTEP)
- Outer UDP header
- A VXLAN header that includes a 24-bit field—called the VXLAN network identifier (VNI)—that is used to uniquely identify the VXLAN. The VNI is similar to a VLAN ID, but having 24 bits allows you to create many more VXLANs than VLANs.

Using an MX Series Routers as a VTEP

You can configure an MX Series router to act as a VTEP and perform all of the following roles:

- Act as a Layer 2 gateway between virtualized and non-virtualized networks in the same data center or between data centers. For example, you can use an MX Series router to connect a network that uses VXLANs to one that uses VLANs.
- Act as a Layer 2 gateway between virtualized networks in the same or different data centers and allow virtual machines to move (VMotion) between those networks and data centers.
- Act as a Layer 3 gateway to route traffic between different VXLANs in the same data center.
- Act as a Layer 3 gateway to route traffic between different VXLANs in different data centers over a WAN or the Internet using standard routing protocols or VPLS tunnels.

NOTE: If you want an MX Series router to be a VXLAN Layer 3 gateway, you must configure integrated routing and bridging (IRB) interfaces to connect the VXLANs, just as you do if you want to route traffic between VLANs.

Load Balancing VXLAN Traffic

The source port field in the UDP header is used to enable ECMP load balancing of the VXLAN traffic in the Layer 3 network. This field is set to a hash of the inner packet fields, which results in a variable that ECMP can use to distinguish between tunnels (flows).

(None of the other fields that flow-based ECMP normally uses are suitable for use with VXLANs. All tunnels between the same two VTEPs have the same outer source and destination IP addresses, and the UDP destination port is set to port 4789 by definition. Therefore, none of these fields provide a sufficient way for ECMP to differentiate flows.)

Configure Multicast Protocols

In order to create VXLAN tunnels between themselves, VTEPs need to learn about each other and which hosts are connected to the other VTEPs. In the absence of a control plane to provide this information, you must enable multicast protocols—IGMP and PIM—on the Layer 3 network to provide a mechanism for VTEPs to learn these addresses. You must also configure each VTEP in a given VXLAN to be a member of the same multicast group. (If possible, you should assign a different multicast group address to each VXLAN.) The VTEPs can then forward ARP requests they receive from their connected hosts to the multicast group. The other VTEPs in the group de-encapsulate the VXLAN information, and (assuming they are members of the same VXLAN) they forward the ARP request to their connected hosts. When the target host receives the ARP request, it responds with its MAC address, and its VTEP forwards this ARP reply back to the source VTEP. Through this process, the VTEPs learn the IP addresses of the other VTEPs in the VXLAN and the MAC addresses of the hosts connected to the other VTEPs.

The multicast groups and trees are also used to forward broadcast, unknown unicast, and multicast (BUM) traffic between VTEPs. This prevents BUM traffic from being unnecessarily flooded outside the VXLAN.

Related Documentation

- Example: Configuring VXLAN on MX Series Routers on page 63

PART 2

Configuration

- Configuration Tasks for Dynamic VLANs on page 23
- Configuration Tasks for Agent Circuit Identifier-Based Dynamic VLANs on page 73
- Dynamic VLANs for Subscriber Access Examples on page 85
- Configuration Statements on page 89

CHAPTER 4

Configuration Tasks for Dynamic VLANs

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- Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Any TPID Values on page 33
- Configuring a Stacked VLAN Dynamic Profile on page 34
- Configuring a VLAN Dynamic Profile That Associates VLAN Interfaces with Separate Routing Instances on page 36
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- Example: Configuring VXLAN on MX Series Routers on page 63

Configuring VLAN Dynamic Profiles

Creating dynamic single-tag VLANs or stacked (dual-tag) VLANs requires the use of dynamic profiles. The dynamic profile automatically references the VLAN interface and creates the interface unit and the necessary VLAN IDs for each new single-tag VLAN or stacked VLAN.

NOTE: VLAN dynamic profiles do not support user-defined variables. Use only Junos VLAN predefined variables when configuring VLAN dynamic profiles. See *Dynamic Variables Overview* for information about dynamic variables.

- Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Standard TPID Values on page 25
- Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Any TPID Values on page 26
- Configuring a Stacked VLAN Dynamic Profile on page 28
- Configuring a VLAN Dynamic Profile That Associates VLAN Interfaces with Separate Routing Instances on page 29

Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Standard TPID Values

You can configure a VLAN dynamic profile to create single-tag VLANs that accept only standard TPID values (a TPID value of 0x8100) by using the **vlan-id** statement and the **$junos-vlan-id** variable.

NOTE: This procedure configures a dynamic profile that accepts only TPID values of 0x8100. To configure a VLAN dynamic profile for creating VLANs using any TPID values, see "Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Any TPID Values" on page 26.

Before you begin:

- Configure the dynamic profile.

  See *Configuring a Basic Dynamic Profile*.

To configure a dynamic VLAN profile:

1. Ensure that the VLAN dynamic profile uses the **$junos-interface-ifd-name** variable for the dynamic interface and the **$junos-interface-unit** variable for the interface unit.
2. (Optional) To support dynamic demux interfaces, enable them using the demux-source statement.
   a. For IPv4 demux interfaces, specify **inet** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set demux-source inet
      ```

   b. For IPv6 demux interfaces, specify **inet6** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set demux-source inet6
      ```

3. (Optional) To configure the router to respond to any ARP request, specify the proxy-arp statement.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set proxy-arp
   ```

4. Specify that you want to use dynamic VLAN IDs in the dynamic profile.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set vlan-id $junos-vlan-id
   ```

   When the dynamic profile is instantiated, the variable is dynamically replaced with a VLAN ID within the VLAN range specified at the **[interfaces]** hierarchy level.

5. Define the unit family type.

   a. For IPv4 interfaces, specify the **inet** family type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set family inet
      ```

   b. For IPv6 interfaces, specify the **inet6** family type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set family inet6
      ```

6. (Optional) Enable IP and MAC address validation for dynamic demux interfaces in a dynamic profile.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit" family inet]
   user@host# set mac-validate loose
   ```

7. Specify the unnumbered address and preferred source address.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit" family inet]
   user@host# set unnumbered-address lo.0 preferred-source-address 192.0.16.1
   ```

Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Any TPID Values

You can configure a VLAN dynamic profile to create single-tag VLANs that accept any TPID values by configuring the **vlan-tags** statement and the **$junos-vlan-id** variable.

NOTE: For procedures to configure a VLAN dynamic profile for creating single-tag VLANs that use only standard TPID values (a TPID value of 0x8100), see "Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Standard TPID Values" on page 25.

Before you begin:

- Configure the dynamic profile.

  See *Configuring a Basic Dynamic Profile*.

To configure a dynamic VLAN profile:

1. Ensure that the VLAN dynamic profile uses the **$junos-interface-ifd-name** variable for the dynamic interface and the **$junos-interface-unit** variable for the interface unit.
2. (Optional) To support dynamic demux interfaces, enable them using the demux-source statement.

   a. For IPv4 demux interfaces, specify **inet** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set demux-source inet
      ```

b. For IPv6 demux interfaces, specify **inet6** as the source type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set demux-source inet6
```

3. (Optional) To configure the router to respond to any ARP request, specify the proxy-arp statement.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set proxy-arp
```

4. Specify that you want to use dynamic VLAN IDs in the dynamic profile.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set vlan-tags outer $junos-vlan-id
```

The variable is dynamically replaced with both the TPID value and a VLAN ID within the VLAN range specified at the **[interfaces]** hierarchy level.

5. Define the unit family type.

a. For IPv4 interfaces, specify the **inet** family type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set family inet
```

b. For IPv6 interfaces, specify the **inet6** family type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set family inet6
```

6. (Optional) Enable IP and MAC address validation for dynamic demux interfaces in a dynamic profile.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit" family inet]
user@host# set mac-validate loose
```

7. Specify the unnumbered address and preferred source address.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit" family inet]
user@host# set unnumbered-address lo.0 preferred-source-address 192.0.16.1
```

Configuring a Stacked VLAN Dynamic Profile

You can configure a dynamic profile for creating stacked 802.1Q VLANs.

Before you begin:

- Configure the dynamic profile.

  See *Configuring a Basic Dynamic Profile*.

To configure a stacked VLAN dynamic profile:

1. Ensure that the VLAN dynamic profile uses the **$junos-interface-ifd-name** variable for the dynamic interface and the **$junos-interface-unit** variable for the interface unit.
2. (Optional) To support dynamic demux interfaces, enable them using the demux-source statement.
   a. For IPv4 demux interfaces, specify **inet** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set demux-source inet
      ```

   b. For IPv6 demux interfaces, specify **inet6** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set demux-source inet6
      ```

3. (Optional) To configure the router to respond to any ARP request, specify the proxy-arp statement.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set proxy-arp
   ```

4. Specify the outer VLAN ID variable.

   ```
   [edit dynamic-profiles STACKED-VLAN-PROF1 interfaces "$junos-interface-ifd-name"
     unit "$junos-interface-unit"]
   user@host# set vlan-tags outer $junos-stacked-vlan-id
   ```

   The variable is dynamically replaced with an outer VLAN ID within the VLAN range specified at the **[interfaces]** hierarchy level.

5. Specify the inner VLAN ID variable.

   ```
   [edit dynamic-profiles STACKED-VLAN-PROF1 interfaces "$junos-interface-ifd-name"
     unit "$junos-interface-unit"]
   user@host# set vlan-tags inner $junos-vlan-id
   ```

   The variable is dynamically replaced with an inner VLAN ID within the VLAN range specified at the **[interfaces]** hierarchy level.

6. Define the unit family type.
   a. For IPv4 interfaces, specify the **inet** family type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set family inet
```

b. For IPv6 interfaces, specify the **inet6** family type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set family inet6
```

7. (Optional) Enable IP and MAC address validation for dynamic demux interfaces in a dynamic profile.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit" family inet]
user@host# set mac-validate loose
```

8. Specify the unnumbered address and preferred source address.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit" family inet]
user@host# set unnumbered-address lo.0 preferred-source-address 192.0.16.1
```

Configuring a VLAN Dynamic Profile That Associates VLAN Interfaces with Separate Routing Instances

You can configure a VLAN dynamic profile that dynamically creates underlying VLAN interfaces and associates these interfaces with statically created routing instances. The VLAN interface is created in the default logical system (LS) for a specific routing instance as defined by VSA 26–1 (Virtual-Router) on the AAA server (for example, RADIUS server).

To configure a dynamic VLAN profile using routing instances:

1. Name the profile.

```
[edit]
user@host# edit dynamic-profiles VLAN_PROFILE_RI
```

2. Specify that you want to dynamically associate routing instances on the default logical system.

```
[edit dynamic-profiles VLAN_PROFILE_RI]
user@host# edit routing-instances $junos-routing-instance
```

3. Define the routing instance **interface** statement with the internal **$junos-interface-name** variable used by the router to match the interface name of the receiving interface.

```
[edit dynamic-profiles VLAN_PROFILE_RI routing-instances “$junos-routing-instance”]
user@host# set interface $junos-interface-name
```

4. Define the dynamic profile **interfaces** statement with the internal **$junos-interface-ifd-name** variable.

```
[edit dynamic-profiles VLAN_PROFILE_RI]
user@host# edit interfaces $junos-interface-ifd-name
```

5. Define the **unit** statement with the internal **$junos-interface-unit** variable used by the router to generate a unit value for the interface.

```
[edit dynamic-profiles VLAN_PROFILE_RI interfaces "$junos-interface-ifd-name"]
user@host# edit unit $junos-interface-unit
```

6. To support dynamic demux interfaces, enable them using the demux-source statement.

   a. For IPv4 demux interfaces, specify **inet** as the source type.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set demux-source inet
   ```

   b. For IPv6 demux interfaces, specify **inet6** as the source type.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set demux-source inet6
   ```

7. (Optional) To configure the router to respond to any ARP request, specify the proxy-arp statement.

   ```
   [edit dynamic-profiles VLAN_PROFILE_RI interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set proxy-arp
   ```

8. Specify that you want to use dynamic VLAN IDs in the dynamic profile.

   ```
   [edit dynamic-profiles VLAN_PROFILE_RI interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set vlan-id $junos-vlan-id
   ```

   The variable is dynamically replaced with both the TPID value and a VLAN ID within the VLAN range specified at the **[interfaces]** hierarchy level.

9. Define the unit family type.

   a. For IPv4 interfaces, specify the **inet** family type.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set family inet
   ```

   b. For IPv6 interfaces, specify the **inet6** family type.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set family inet6
   ```

10. (Optional) Enable IP and MAC address validation for dynamic demux interfaces in a dynamic profile.

    ```
    [edit dynamic-profiles VLAN_PROFILE_RI interfaces "$junos-interface-ifd-name" unit
      "$junos-interface-unit" family inet]
    user@host# set mac-validate loose
    ```

11. Specify the unnumbered address to dynamically apply a loopback interface.

NOTE: **You can optionally specify the preferred source address. This option is included in the step.**

```
[edit dynamic-profiles VLAN_PROFILE_RI interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit" family inet]
user@host# set unnumbered-address $junos-loopback-interface
  preferred-source-address 192.0.16.1
```

Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Standard TPID Values

You can configure a VLAN dynamic profile to create single-tag VLANs that accept only standard TPID values (a TPID value of 0x8100) by using the **vlan-id** statement and the **$junos-vlan-id** variable.

NOTE: This procedure configures a dynamic profile that accepts only TPID values of 0x8100. To configure a VLAN dynamic profile for creating VLANs using any TPID values, see "Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Any TPID Values" on page 26.

Before you begin:

- Configure the dynamic profile.

  See *Configuring a Basic Dynamic Profile*.

To configure a dynamic VLAN profile:

1. Ensure that the VLAN dynamic profile uses the **$junos-interface-ifd-name** variable for the dynamic interface and the **$junos-interface-unit** variable for the interface unit.
2. (Optional) To support dynamic demux interfaces, enable them using the demux-source statement.
   a. For IPv4 demux interfaces, specify **inet** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set demux-source inet
      ```

   b. For IPv6 demux interfaces, specify **inet6** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set demux-source inet6
      ```

3. (Optional) To configure the router to respond to any ARP request, specify the proxy-arp statement.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set proxy-arp
   ```

4. Specify that you want to use dynamic VLAN IDs in the dynamic profile.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   ```

```
user@host# set vlan-id $junos-vlan-id
```

When the dynamic profile is instantiated, the variable is dynamically replaced with a VLAN ID within the VLAN range specified at the **[interfaces]** hierarchy level.

5. Define the unit family type.

   a. For IPv4 interfaces, specify the **inet** family type.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set family inet
   ```

   b. For IPv6 interfaces, specify the **inet6** family type.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set family inet6
   ```

6. (Optional) Enable IP and MAC address validation for dynamic demux interfaces in a dynamic profile.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit" family inet]
   user@host# set mac-validate loose
   ```

7. Specify the unnumbered address and preferred source address.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit" family inet]
   user@host# set unnumbered-address lo.0 preferred-source-address 192.0.16.1
   ```

Related Documentation

- *Configuring a Basic Dynamic Profile*
- Dynamic 802.1Q VLAN Overview on page 3
- *Dynamic Variables Overview*
- *Junos OS Predefined Variables*

Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Any TPID Values

You can configure a VLAN dynamic profile to create single-tag VLANs that accept any TPID values by configuring the **vlan-tags** statement and the **$junos-vlan-id** variable.

NOTE: For procedures to configure a VLAN dynamic profile for creating single-tag VLANs that use only standard TPID values (a TPID value of 0x8100), see "Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Standard TPID Values" on page 25.

Before you begin:

- Configure the dynamic profile.

  See *Configuring a Basic Dynamic Profile*.

To configure a dynamic VLAN profile:

1. Ensure that the VLAN dynamic profile uses the **$junos-interface-ifd-name** variable for the dynamic interface and the **$junos-interface-unit** variable for the interface unit.
2. (Optional) To support dynamic demux interfaces, enable them using the demux-source statement.

   a. For IPv4 demux interfaces, specify **inet** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set demux-source inet
      ```

   b. For IPv6 demux interfaces, specify **inet6** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set demux-source inet6
      ```

3. (Optional) To configure the router to respond to any ARP request, specify the proxy-arp statement.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set proxy-arp
   ```

4. Specify that you want to use dynamic VLAN IDs in the dynamic profile.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit"]
   user@host# set vlan-tags outer $junos-vlan-id
   ```

   The variable is dynamically replaced with both the TPID value and a VLAN ID within the VLAN range specified at the **[interfaces]** hierarchy level.

5. Define the unit family type.

   a. For IPv4 interfaces, specify the **inet** family type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set family inet
      ```

   b. For IPv6 interfaces, specify the **inet6** family type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set family inet6
      ```

6. (Optional) Enable IP and MAC address validation for dynamic demux interfaces in a dynamic profile.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit" family inet]
   user@host# set mac-validate loose
   ```

7. Specify the unnumbered address and preferred source address.

   ```
   [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
     "$junos-interface-unit" family inet]
   user@host# set unnumbered-address lo.0 preferred-source-address 192.0.16.1
   ```

Related Documentation

- *Configuring a Basic Dynamic Profile*
- Dynamic 802.1Q VLAN Overview on page 3
- *Dynamic Variables Overview*
- *Junos OS Predefined Variables*
- *Configuring Frames with Particular TPIDs to Be Processed as Tagged Frames*

Configuring a Stacked VLAN Dynamic Profile

You can configure a dynamic profile for creating stacked 802.1Q VLANs.

Before you begin:

- Configure the dynamic profile.

  See *Configuring a Basic Dynamic Profile*.

To configure a stacked VLAN dynamic profile:

1. Ensure that the VLAN dynamic profile uses the **$junos-interface-ifd-name** variable for the dynamic interface and the **$junos-interface-unit** variable for the interface unit.
2. (Optional) To support dynamic demux interfaces, enable them using the demux-source statement.

   a. For IPv4 demux interfaces, specify **inet** as the source type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set demux-source inet
```

b. For IPv6 demux interfaces, specify **inet6** as the source type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set demux-source inet6
```

3. (Optional) To configure the router to respond to any ARP request, specify the proxy-arp statement.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set proxy-arp
```

4. Specify the outer VLAN ID variable.

```
[edit dynamic-profiles STACKED-VLAN-PROF1 interfaces "$junos-interface-ifd-name"
  unit "$junos-interface-unit"]
user@host# set vlan-tags outer $junos-stacked-vlan-id
```

The variable is dynamically replaced with an outer VLAN ID within the VLAN range specified at the **[interfaces]** hierarchy level.

5. Specify the inner VLAN ID variable.

```
[edit dynamic-profiles STACKED-VLAN-PROF1 interfaces "$junos-interface-ifd-name"
  unit "$junos-interface-unit"]
user@host# set vlan-tags inner $junos-vlan-id
```

The variable is dynamically replaced with an inner VLAN ID within the VLAN range specified at the **[interfaces]** hierarchy level.

6. Define the unit family type.

a. For IPv4 interfaces, specify the **inet** family type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set family inet
```

b. For IPv6 interfaces, specify the **inet6** family type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set family inet6
```

7. (Optional) Enable IP and MAC address validation for dynamic demux interfaces in a dynamic profile.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit" family inet]
user@host# set mac-validate loose
```

8. Specify the unnumbered address and preferred source address.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit" family inet]
user@host# set unnumbered-address lo.0 preferred-source-address 192.0.16.1
```

Related Documentation

- *Configuring a Basic Dynamic Profile*
- Dynamic 802.1Q VLAN Overview on page 3
- *Dynamic Variables Overview*
- *Junos OS Predefined Variables*

Configuring a VLAN Dynamic Profile That Associates VLAN Interfaces with Separate Routing Instances

You can configure a VLAN dynamic profile that dynamically creates underlying VLAN interfaces and associates these interfaces with statically created routing instances. The VLAN interface is created in the default logical system (LS) for a specific routing instance as defined by VSA 26–1 (Virtual-Router) on the AAA server (for example, RADIUS server).

To configure a dynamic VLAN profile using routing instances:

1. Name the profile.

   ```
   [edit]
   user@host# edit dynamic-profiles VLAN_PROFILE_RI
   ```

2. Specify that you want to dynamically associate routing instances on the default logical system.

   ```
   [edit dynamic-profiles VLAN_PROFILE_RI]
   user@host# edit routing-instances $junos-routing-instance
   ```

3. Define the routing instance **interface** statement with the internal **$junos-interface-name** variable used by the router to match the interface name of the receiving interface.

   ```
   [edit dynamic-profiles VLAN_PROFILE_RI routing-instances “$junos-routing-instance”]
   user@host# set interface $junos-interface-name
   ```

4. Define the dynamic profile **interfaces** statement with the internal **$junos-interface-ifd-name** variable.

   ```
   [edit dynamic-profiles VLAN_PROFILE_RI]
   user@host# edit interfaces $junos-interface-ifd-name
   ```

5. Define the **unit** statement with the internal **$junos-interface-unit** variable used by the router to generate a unit value for the interface.

   ```
   [edit dynamic-profiles VLAN_PROFILE_RI interfaces "$junos-interface-ifd-name"]
   user@host# edit unit $junos-interface-unit
   ```

6. To support dynamic demux interfaces, enable them using the demux-source statement.

   a. For IPv4 demux interfaces, specify **inet** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      user@host# set demux-source inet
      ```

   b. For IPv6 demux interfaces, specify **inet6** as the source type.

      ```
      [edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
        "$junos-interface-unit"]
      ```

```
user@host# set demux-source inet6
```

7. (Optional) To configure the router to respond to any ARP request, specify the proxy-arp statement.

```
[edit dynamic-profiles VLAN_PROFILE_RI interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set proxy-arp
```

8. Specify that you want to use dynamic VLAN IDs in the dynamic profile.

```
[edit dynamic-profiles VLAN_PROFILE_RI interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set vlan-id $junos-vlan-id
```

   The variable is dynamically replaced with both the TPID value and a VLAN ID within the VLAN range specified at the **[interfaces]** hierarchy level.

9. Define the unit family type.

   a. For IPv4 interfaces, specify the **inet** family type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set family inet
```

   b. For IPv6 interfaces, specify the **inet6** family type.

```
[edit dynamic-profiles VLAN-PROF1 interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit"]
user@host# set family inet6
```

10. (Optional) Enable IP and MAC address validation for dynamic demux interfaces in a dynamic profile.

```
[edit dynamic-profiles VLAN_PROFILE_RI interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit" family inet]
user@host# set mac-validate loose
```

11. Specify the unnumbered address to dynamically apply a loopback interface.

NOTE: You can optionally specify the preferred source address. This option is included in the step.

```
[edit dynamic-profiles VLAN_PROFILE_RI interfaces "$junos-interface-ifd-name" unit
  "$junos-interface-unit" family inet]
user@host# set unnumbered-address $junos-loopback-interface
  preferred-source-address 192.0.16.1
```

Related Documentation

- *Configuring a Basic Dynamic Profile*
- Dynamic 802.1Q VLAN Overview on page 3
- *Dynamic Variables Overview*
- *Junos OS Predefined Variables*
- *Configuring Frames with Particular TPIDs to Be Processed as Tagged Frames*

- Configuring Dynamic Authentication for VLAN Interfaces on page 53

Configuring VLAN Interfaces to Use Dynamic Profiles

You can configure an interface to use a single-tag VLAN or stacked (dual-tag) VLAN dynamic profile when creating dynamic VLANs. The dynamic profile assigns a VLAN ID to each VLAN dynamically created over the interface by using the single-tag VLAN and stacked VLAN ranges configured for the VLAN interface. You can configure VLAN interfaces to use dynamic profiles in the following ways:

- Associating a Single-Tag VLAN Dynamic Profile with an Interface on page 38
- Associating a Stacked VLAN Dynamic Profile with an Interface on page 38

Associating a Single-Tag VLAN Dynamic Profile with an Interface

Before you begin:

- Configure the VLAN dynamic profile.

  See *Configuring a Basic Dynamic Profile*.

To associate a single-tag VLAN dynamic profile with an interface:

1. Access the interface that you want to use for creating VLANs.

   ```
   [edit]
   user@host# edit interfaces ge-1/0/0
   ```

2. Edit the auto-configure stanza to automatically configure VLANs.

   ```
   [edit interfaces ge-1/0/0]
   user@host# edit auto-configure
   ```

3. Edit the vlan-ranges stanza.

   ```
   [edit interfaces ge-1/0/0 auto-configure]
   user@host# edit vlan-ranges
   ```

4. Specify the dynamic VLAN profile that you want the interface to use.

   ```
   [edit interfaces ge-1/0/0 auto-configure vlan-ranges]
   user@host# set dynamic-profile VLAN-PROF1
   ```

Associating a Stacked VLAN Dynamic Profile with an Interface

To associate a stacked (dual-tag) VLAN dynamic profile with an interface:

1. Access the interface that you want to use for creating VLANs.

   ```
   [edit interfaces]
   user@host# edit interfaces ge-1/0/0
   ```

2. Edit the auto-configure stanza to automatically configure the stacked VLANs.

   ```
   [edit interfaces ge-1/0/0]
   user@host# edit auto-configure
   ```

3. Edit the stacked-vlan-ranges stanza.

```
[edit interfaces ge-1/0/0 auto-configure]
user@host# edit stacked-vlan-ranges
```

4. Specify the dynamic VLAN profile that you want the interface to use.

```
[edit interfaces ge-1/0/0 auto-configure stacked-vlan-ranges]
user@host# set dynamic-profile STACKED-VLAN-PROF1
```

Associating a Single-Tag VLAN Dynamic Profile with an Interface

Before you begin:

- Configure the VLAN dynamic profile.

  See *Configuring a Basic Dynamic Profile*.

To associate a single-tag VLAN dynamic profile with an interface:

1. Access the interface that you want to use for creating VLANs.

```
[edit]
user@host# edit interfaces ge-1/0/0
```

2. Edit the auto-configure stanza to automatically configure VLANs.

```
[edit interfaces ge-1/0/0]
user@host# edit auto-configure
```

3. Edit the vlan-ranges stanza.

```
[edit interfaces ge-1/0/0 auto-configure]
user@host# edit vlan-ranges
```

4. Specify the dynamic VLAN profile that you want the interface to use.

```
[edit interfaces ge-1/0/0 auto-configure vlan-ranges]
user@host# set dynamic-profile VLAN-PROF1
```

Related Documentation

- Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Standard TPID Values on page 25
- Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Any TPID Values on page 26
- Dynamic 802.1Q VLAN Overview on page 3

Associating a Stacked VLAN Dynamic Profile with an Interface

To associate a stacked (dual-tag) VLAN dynamic profile with an interface:

1. Access the interface that you want to use for creating VLANs.

```
[edit interfaces]
user@host# edit interfaces ge-1/0/0
```

2. Edit the auto-configure stanza to automatically configure the stacked VLANs.

```
[edit interfaces ge-1/0/0]
user@host# edit auto-configure
```

3. Edit the stacked-vlan-ranges stanza.

```
[edit interfaces ge-1/0/0 auto-configure]
user@host# edit stacked-vlan-ranges
```

4. Specify the dynamic VLAN profile that you want the interface to use.

```
[edit interfaces ge-1/0/0 auto-configure stacked-vlan-ranges]
user@host# set dynamic-profile STACKED-VLAN-PROF1
```

Related Documentation

- Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Standard TPID Values on page 25
- Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Any TPID Values on page 26
- Configuring a Stacked VLAN Dynamic Profile on page 28
- Dynamic 802.1Q VLAN Overview on page 3

Configuring Which VLAN Ethernet Packet Types Dynamic Profiles Can Accept

To create dynamic single-tag VLANs and dynamic stacked (dual-tag) VLANs, you must specify what Ethernet packet type you want the single-tag VLAN or stacked VLAN dynamic profile to accept. You can configure which VLAN Ethernet packet types a dynamic profile accepts in the following ways:

- Configuring the VLAN Ethernet Packet Type for Single-Tag VLAN Dynamic Profiles on page 40
- Configuring the VLAN Ethernet Packet Type for Stacked VLAN Dynamic Profiles on page 41

Configuring the VLAN Ethernet Packet Type for Single-Tag VLAN Dynamic Profiles

To configure the VLAN Ethernet packet type the VLAN dynamic profile can accept:

1. Access the interface over which you want to create dynamic VLANs.

```
user@host# edit interfaces ge-0/0/0
```

2. Edit the VLAN **auto-configure** stanza.

```
[edit interfaces ge-0/0/0]
user@host# edit auto-configure
```

3. Edit the **vlan-ranges** stanza.

```
[edit interfaces ge-0/0/0 auto-configure]
user@host# edit vlan-ranges
```

4. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

```
[edit interfaces ge-0/0/0 auto-configure vlan-ranges]
user@host# edit dynamic-profile VLAN-PROF1
```

5. Specify what VLAN Ethernet packet type the VLAN or stacked VLAN dynamic profile accepts.

NOTE: This release supports **inet** and **dhcp-v4** for IPv4 packets, **inet6** and **dhcp-v6** for IPv6 packets, and **pppoe** for PPP packets.

```
[edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF-1]
user@host# set accept inet
```

Configuring the VLAN Ethernet Packet Type for Stacked VLAN Dynamic Profiles

To configure the VLAN Ethernet packet type the stacked VLAN dynamic profile can accept:

1. Access the interface over which you want to create dynamic VLANs.

```
user@host# edit interfaces ge-0/0/0
```

2. Edit the VLAN **auto-configure** stanza.

```
[edit interfaces ge-0/0/0]
user@host# edit auto-configure
```

3. Edit the **stacked-vlan-ranges** stanza.

```
[edit interfaces ge-0/0/0 auto-configure]
user@host# edit stacked-vlan-ranges
```

4. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

```
[edit interfaces ge-0/0/0 auto-configure stacked-vlan-ranges]
user@host# edit dynamic-profile STACKED-VLAN-PROF1
```

5. Specify what VLAN Ethernet packet type the stacked VLAN dynamic profile accepts.

NOTE: This release supports **inet** and **dhcp-v4** for IPv4 packets, **inet6** and **dhcp-v6** for IPv6 packets, and **pppoe** for PPP packets.

```
[edit interfaces ge-0/0/0 auto-configure stacked-vlan-ranges dynamic-profile
  STACKED-VLAN-PROF1]
user@host# set accept inet
```

Configuring the VLAN Ethernet Packet Type for Single-Tag VLAN Dynamic Profiles

To configure the VLAN Ethernet packet type the VLAN dynamic profile can accept:

1. Access the interface over which you want to create dynamic VLANs.

```
user@host# edit interfaces ge-0/0/0
```

2. Edit the VLAN **auto-configure** stanza.

```
[edit interfaces ge-0/0/0]
user@host# edit auto-configure
```

3. Edit the **vlan-ranges** stanza.

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit vlan-ranges
   ```

4. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit dynamic-profile VLAN-PROF1
   ```

5. Specify what VLAN Ethernet packet type the VLAN or stacked VLAN dynamic profile accepts.

   NOTE: This release supports **inet** and **dhcp-v4** for IPv4 packets, **inet6** and **dhcp-v6** for IPv6 packets, and **pppoe** for PPP packets.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF-1]
   user@host# set accept inet
   ```

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3
- Configuring VLAN Dynamic Profiles on page 24
- Configuring VLAN Interfaces to Use Dynamic Profiles on page 38

Configuring the VLAN Ethernet Packet Type for Stacked VLAN Dynamic Profiles

To configure the VLAN Ethernet packet type the stacked VLAN dynamic profile can accept:

1. Access the interface over which you want to create dynamic VLANs.

   ```
   user@host# edit interfaces ge-0/0/0
   ```

2. Edit the VLAN **auto-configure** stanza.

   ```
   [edit interfaces ge-0/0/0]
   user@host# edit auto-configure
   ```

3. Edit the **stacked-vlan-ranges** stanza.

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit stacked-vlan-ranges
   ```

4. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure stacked-vlan-ranges]
   user@host# edit dynamic-profile STACKED-VLAN-PROF1
   ```

5. Specify what VLAN Ethernet packet type the stacked VLAN dynamic profile accepts.

   NOTE: This release supports **inet** and **dhcp-v4** for IPv4 packets, **inet6** and **dhcp-v6** for IPv6 packets, and **pppoe** for PPP packets.

```
[edit interfaces ge-0/0/0 auto-configure stacked-vlan-ranges dynamic-profile
  STACKED-VLAN-PROF1]
user@host# set accept inet
```

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3
- Configuring VLAN Dynamic Profiles on page 24
- Configuring VLAN Interfaces to Use Dynamic Profiles on page 38
- Configuring Dynamic Authentication for VLAN Interfaces on page 53

Configuring an Authentication Password for VLAN or Stacked VLAN Ranges

You can specify an authentication password for dynamically created VLAN or stacked VLAN interfaces at the **[edit interfaces *interface-name* auto-configure vlan-ranges authentication]** or **[edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication]** hierarchy level. This password is sent to the external AAA authentication server for subscriber authentication.

NOTE: You must configure the username-include statement to enable the use of authentication. The password (Interfaces) statement is not required and does not cause the interface to use authentication if the username-include statement is not included.

To configure an authentication password:

1. Access the interface over which you want to create dynamic VLANs.

   ```
   user@host# edit interfaces ge-0/0/0
   ```

2. Edit the VLAN **auto-configure** stanza.

   ```
   [edit interfaces ge-0/0/0]
   user@host# edit auto-configure
   ```

3. Edit the **vlan-ranges** or **stacked-vlan-ranges** stanza.

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit vlan-ranges
   ```

   or

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit stacked-vlan-ranges
   ```

4. Edit the VLAN **authentication** stanza.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit authentication
   ```

5. Specify a password that is sent to the external AAA authentication server for subscriber authentication.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# set password (Interfaces) PSSWD1
   ```

Related Documentation

- Configuring Dynamic Authentication for VLAN Interfaces on page 53

Configuring VLAN Ranges for Use with Dynamic Profiles

You define dynamic VLAN ranges under the **[edit interfaces]** hierarchy. You can configure VLAN ranges in the following ways for use with dynamic profiles:

- Configuring Single-Level VLAN Ranges for Use with VLAN Dynamic Profiles on page 44
- Configuring Stacked VLAN Ranges for Use with Stacked VLAN Dynamic Profiles on page 45
- Configuring Dynamic Mixed VLAN Ranges on page 46
- Configuring VLAN Dynamic Profile Override on page 47

Configuring Single-Level VLAN Ranges for Use with VLAN Dynamic Profiles

You configure VLAN ranges at the **[edit interfaces]** hierarchy level by specifying the **vlan-tagging** statement for the interface and defining up to 32 VLAN ranges for use with a VLAN dynamic profile.

To configure a VLAN range:

1. Access the interface over which you want to create dynamic VLANs.

   ```
   user@host# edit interfaces ge-0/0/0
   ```

2. Specify the **vlan-tagging** statement to indicate that this interface is for use with stacked VLAN ranges.

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

3. Access the VLAN **[auto-configure]** hierarchy level.

   ```
   [edit interfaces ge-0/0/0]
   user@host# edit auto-configure
   ```

4. Access the **[vlan-ranges]** hierarchy level.

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit vlan-ranges
   ```

5. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit dynamic-profile VLAN-PROF1
   ```

6. Specify the VLAN ranges that you want the dynamic profile to use. The following example specifies a lower VLAN ID limit of 3000 and any upper VLAN ID limit (a range from 1 through 4094).

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF1]
   user@host# set ranges 3000-any
   ```

NOTE: You can configure multiple VLAN range groups (up to 32 total) on the same physical interface that use different VLAN dynamic profiles.

7. (Optional) Access another VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit dynamic-profile VLAN-PROF2
   ```

8. (Optional) Specify the VLAN ranges that you want the dynamic profile to use. The following example specifies a lower VLAN ID limit of 2000 and any upper VLAN ID limit (a range from 1 through 4094).

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF2]
   user@host# set ranges 2000-any
   ```

Configuring Stacked VLAN Ranges for Use with Stacked VLAN Dynamic Profiles

You configure stacked VLAN ranges at the **[edit interfaces]** hierarchy level by specifying the **stacked-vlan-tagging** statement for the interface and defining up to 32 stacked VLAN ranges for use with a stacked VLAN dynamic profile.

To configure a VLAN range:

1. Access the interface over which you want to create dynamic VLANs.

   ```
   user@host# edit interfaces ge-0/0/0
   ```

2. Specify the **stacked-vlan-tagging** statement to indicate that this interface is for use with stacked VLAN ranges.

   ```
   [edit interfaces ge-0/0/0]
   user@host# set stacked-vlan-tagging
   ```

3. Access the VLAN **[auto-configure]** hierarchy level.

   ```
   [edit interfaces ge-0/0/0]
   user@host# edit auto-configure
   ```

4. Access the **[stacked-vlan-ranges]** hierarchy level.

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit stacked-vlan-ranges
   ```

5. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit dynamic-profile VLAN-PROF1
   ```

6. Specify the outer and inner stacked VLAN ranges that you want the dynamic profile to use. The following example specifies an outer stacked VLAN ID range from 2000 through 4000 and an inner stacked VLAN ID range of **any** (enabling a range from 1 through 4094 for the inner stacked VLAN ID).

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF1]
   user@host# set ranges 2000-4000,any
   ```

NOTE: You can configure multiple dynamic profile associations (up to 32) with different VLAN range groups on each physical interface.

7. (Optional) Access another VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit dynamic-profile VLAN-PROF2
   ```

8. (Optional) Specify the outer and inner stacked VLAN ranges that you want the dynamic profile to use. The following example specifies an outer stacked VLAN ID range from 3001 through 4000 and an inner stacked VLAN ID range of **any** (enabling a range from 1 through 4094 for the inner stacked VLAN ID).

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF2]
   user@host# set ranges 3001-4000,any
   ```

Configuring Dynamic Mixed VLAN Ranges

Dynamic VLAN and dynamic stacked VLAN configuration supports mixed (or flexible) VLAN ranges. You configure mixed VLAN ranges at the **[edit interfaces]** hierarchy level by specifying the **flexible-vlan-tagging** statement for the interface and defining up to 32 VLAN and stacked VLAN range groups for use with different VLAN or stacked VLAN dynamic profiles.

NOTE: Junos VLAN IDs for single-tag VLANs are equivalent to the outer tags used for stacked (dual-tag) VLANs. When configuring mixed (flexible) VLANs, any overlap on single-tag VLAN IDs and stacked VLAN outer tag values is supported only for dynamic VLANs on MPC line cards. When configuring mixed (flexible) VLANS on DPCE line cards, overlapping single-tag VLAN IDs and stacked VLAN outer tag values is not supported. This means that a dynamically created single-tagged VLAN interface prevents any overlapping stacked VLAN interfaces from being created or a dynamically created stacked VLAN interface prevents any overlapping single-tagged VLAN interfaces from being created.

To configure both VLAN and stacked VLAN ranges:

1. Access the interface over which you want to create dynamic VLANs.

   ```
   user@host# edit interfaces ge-0/0/0
   ```

2. Specify the **flexible-vlan-tagging** statement to indicate that this interface is for use with both VLAN and stacked VLAN ranges.

   ```
   [edit interfaces ge-0/0/0]
   user@host# set flexible-vlan-tagging
   ```

3. Define interface automatic configuration values.

   ```
   [edit interfaces ge-0/0/0]
   user@host# edit auto-configure
   ```

4. Specify that you want to modify VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit vlan-ranges
   ```

5. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit dynamic-profile VLAN-PROF1
   ```

6. Specify the VLAN ranges that you want the dynamic profile to use. The following example specifies a lower VLAN ID limit of 2000 and an upper VLAN ID limit of 3000.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF1]
   user@host# set ranges 2000-3000
   ```

   NOTE: You can configure multiple dynamic profile associations (up to 32) with different VLAN range groups on each physical interface.

7. Specify that you want to modify stacked VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit stacked-vlan-ranges
   ```

8. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure stacked-vlan-ranges]
   user@host# edit dynamic-profile VLAN-PROF2
   ```

9. Specify the outer and inner stacked VLAN ranges that you want the dynamic profile to use. The following example specifies an outer stacked VLAN ID range from 3001 through 4000 (to avoid overlapping VLAN IDs with single-tag VLANs) and an inner stacked VLAN ID range of **any** (enabling a range from 1 through 4094 for the inner stacked VLAN ID).

   ```
   [edit interfaces ge-0/0/0 auto-configure stacked-vlan-ranges dynamic-profile
     VLAN-PROF2]
   user@host# set ranges 3001-4000,any
   ```

   NOTE: You can configure multiple dynamic profile associations (up to 32) with different VLAN range groups on each physical interface.

Configuring VLAN Dynamic Profile Override

You can override dynamic profile assignment to individual VLANs that are already part of a previously defined VLAN range. This functionality provides a type of exception to an assigned VLAN range. It enables you to configure individual VLAN IDs to use a different dynamic profile from the one assigned to the VLAN range that includes the individual VLAN ID.

To configure dynamic profile override for a specific VLAN:

1. Access the interface on which you want to create a dynamic profile override.

```
user@host# edit interfaces ge-0/0/0
```

2. Access the interface automatic configuration hierarchy.

```
[edit interfaces ge-0/0/0]
user@host# edit auto-configure
```

3. Access either the single-tagged or dual-tagged (stacked) VLAN ranges that you want to modify.

```
[edit interfaces ge-0/0/0 auto-configure]
user@host# edit vlan-ranges
```

or

```
[edit interfaces ge-0/0/0 auto-configure]
user@host# edit stacked-vlan-ranges
```

4. Define the **override** statement along with the VLAN tag that you want to override and the dynamic profile that you want to use when overriding the specified VLAN tag.

```
[edit interfaces ge-0/0/0 auto-configure vlan-ranges]
user@host# set override tag 20 dynamic-profile NewProfile
```

or

```
[edit interfaces ge-0/0/0 auto-configure stacked-vlan-ranges]
user@host# set override tag 20 dynamic-profile NewProfile
```

Configuring Single-Level VLAN Ranges for Use with VLAN Dynamic Profiles

You configure VLAN ranges at the **[edit interfaces]** hierarchy level by specifying the **vlan-tagging** statement for the interface and defining up to 32 VLAN ranges for use with a VLAN dynamic profile.

To configure a VLAN range:

1. Access the interface over which you want to create dynamic VLANs.

```
user@host# edit interfaces ge-0/0/0
```

2. Specify the **vlan-tagging** statement to indicate that this interface is for use with stacked VLAN ranges.

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

3. Access the VLAN **[auto-configure]** hierarchy level.

```
[edit interfaces ge-0/0/0]
user@host# edit auto-configure
```

4. Access the **[vlan-ranges]** hierarchy level.

```
[edit interfaces ge-0/0/0 auto-configure]
user@host# edit vlan-ranges
```

5. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

```
[edit interfaces ge-0/0/0 auto-configure vlan-ranges]
user@host# edit dynamic-profile VLAN-PROF1
```

6. Specify the VLAN ranges that you want the dynamic profile to use. The following example specifies a lower VLAN ID limit of 3000 and any upper VLAN ID limit (a range from 1 through 4094).

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF1]
   user@host# set ranges 3000-any
   ```

   NOTE: You can configure multiple VLAN range groups (up to 32 total) on the same physical interface that use different VLAN dynamic profiles.

7. (Optional) Access another VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit dynamic-profile VLAN-PROF2
   ```

8. (Optional) Specify the VLAN ranges that you want the dynamic profile to use. The following example specifies a lower VLAN ID limit of 2000 and any upper VLAN ID limit (a range from 1 through 4094).

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF2]
   user@host# set ranges 2000-any
   ```

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3
- Configuring VLAN Dynamic Profiles on page 24
- Configuring VLAN Interfaces to Use Dynamic Profiles on page 38

Configuring Stacked VLAN Ranges for Use with Stacked VLAN Dynamic Profiles

You configure stacked VLAN ranges at the **[edit interfaces]** hierarchy level by specifying the **stacked-vlan-tagging** statement for the interface and defining up to 32 stacked VLAN ranges for use with a stacked VLAN dynamic profile.

To configure a VLAN range:

1. Access the interface over which you want to create dynamic VLANs.

   ```
   user@host# edit interfaces ge-0/0/0
   ```

2. Specify the **stacked-vlan-tagging** statement to indicate that this interface is for use with stacked VLAN ranges.

   ```
   [edit interfaces ge-0/0/0]
   user@host# set stacked-vlan-tagging
   ```

3. Access the VLAN **[auto-configure]** hierarchy level.

   ```
   [edit interfaces ge-0/0/0]
   user@host# edit auto-configure
   ```

4. Access the **[stacked-vlan-ranges]** hierarchy level.

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit stacked-vlan-ranges
   ```

5. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit dynamic-profile VLAN-PROF1
   ```

6. Specify the outer and inner stacked VLAN ranges that you want the dynamic profile to use. The following example specifies an outer stacked VLAN ID range from 2000 through 4000 and an inner stacked VLAN ID range of **any** (enabling a range from 1 through 4094 for the inner stacked VLAN ID).

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF1]
   user@host# set ranges 2000-4000,any
   ```

   NOTE: You can configure multiple dynamic profile associations (up to 32) with different VLAN range groups on each physical interface.

7. (Optional) Access another VLAN dynamic profile for which you want to configure VLAN ranges.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit dynamic-profile VLAN-PROF2
   ```

8. (Optional) Specify the outer and inner stacked VLAN ranges that you want the dynamic profile to use. The following example specifies an outer stacked VLAN ID range from 3001 through 4000 and an inner stacked VLAN ID range of **any** (enabling a range from 1 through 4094 for the inner stacked VLAN ID).

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF2]
   user@host# set ranges 3001-4000,any
   ```

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3
- Configuring VLAN Dynamic Profiles on page 24
- Configuring VLAN Interfaces to Use Dynamic Profiles on page 38

Configuring Dynamic Mixed VLAN Ranges

Dynamic VLAN and dynamic stacked VLAN configuration supports mixed (or flexible) VLAN ranges. You configure mixed VLAN ranges at the **[edit interfaces]** hierarchy level by specifying the **flexible-vlan-tagging** statement for the interface and defining up to 32 VLAN and stacked VLAN range groups for use with different VLAN or stacked VLAN dynamic profiles.

NOTE: Junos VLAN IDs for single-tag VLANs are equivalent to the outer tags used for stacked (dual-tag) VLANs. When configuring mixed (flexible) VLANs, any overlap on single-tag VLAN IDs and stacked VLAN outer tag values is supported only for dynamic VLANs on MPC line cards. When configuring mixed (flexible) VLANS on DPCE line cards, overlapping single-tag VLAN IDs and stacked VLAN outer tag values is not supported. This means that a dynamically created single-tagged VLAN interface prevents any overlapping stacked VLAN interfaces from being created or a dynamically created stacked VLAN interface prevents any overlapping single-tagged VLAN interfaces from being created.

To configure both VLAN and stacked VLAN ranges:

1. Access the interface over which you want to create dynamic VLANs.

   user@host# **edit** interfaces **ge-0/0/0**

2. Specify the **flexible-vlan-tagging** statement to indicate that this interface is for use with both VLAN and stacked VLAN ranges.

   [edit interfaces ge-0/0/0]
   user@host# **set flexible-vlan-tagging**

3. Define interface automatic configuration values.

   [edit interfaces ge-0/0/0]
   user@host# **edit** auto-configure

4. Specify that you want to modify VLAN ranges.

   [edit interfaces ge-0/0/0 auto-configure]
   user@host# **edit** vlan-ranges

5. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# **edit** dynamic-profile **VLAN-PROF1**

6. Specify the VLAN ranges that you want the dynamic profile to use. The following example specifies a lower VLAN ID limit of 2000 and an upper VLAN ID limit of 3000.

   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF1]
   user@host# **set** ranges **2000-3000**

NOTE: You can configure multiple dynamic profile associations (up to 32) with different VLAN range groups on each physical interface.

7. Specify that you want to modify stacked VLAN ranges.

```
[edit interfaces ge-0/0/0 auto-configure]
user@host# edit stacked-vlan-ranges
```

8. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

```
[edit interfaces ge-0/0/0 auto-configure stacked-vlan-ranges]
user@host# edit dynamic-profile VLAN-PROF2
```

9. Specify the outer and inner stacked VLAN ranges that you want the dynamic profile to use. The following example specifies an outer stacked VLAN ID range from 3001 through 4000 (to avoid overlapping VLAN IDs with single-tag VLANs) and an inner stacked VLAN ID range of **any** (enabling a range from 1 through 4094 for the inner stacked VLAN ID).

```
[edit interfaces ge-0/0/0 auto-configure stacked-vlan-ranges dynamic-profile
  VLAN-PROF2]
user@host# set ranges 3001-4000,any
```

NOTE: You can configure multiple dynamic profile associations (up to 32) with different VLAN range groups on each physical interface.

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3
- Configuring VLAN Dynamic Profiles on page 24
- Configuring VLAN Interfaces to Use Dynamic Profiles on page 38

Configuring VLAN Dynamic Profile Override

You can override dynamic profile assignment to individual VLANs that are already part of a previously defined VLAN range. This functionality provides a type of exception to an assigned VLAN range. It enables you to configure individual VLAN IDs to use a different dynamic profile from the one assigned to the VLAN range that includes the individual VLAN ID.

To configure dynamic profile override for a specific VLAN:

1. Access the interface on which you want to create a dynamic profile override.

```
user@host# edit interfaces ge-0/0/0
```

2. Access the interface automatic configuration hierarchy.

```
[edit interfaces ge-0/0/0]
user@host# edit auto-configure
```

3. Access either the single-tagged or dual-tagged (stacked) VLAN ranges that you want to modify.

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit vlan-ranges
   ```

   or

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit stacked-vlan-ranges
   ```

4. Define the **override** statement along with the VLAN tag that you want to override and the dynamic profile that you want to use when overriding the specified VLAN tag.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# set override tag 20 dynamic-profile NewProfile
   ```

   or

   ```
   [edit interfaces ge-0/0/0 auto-configure stacked-vlan-ranges]
   user@host# set override tag 20 dynamic-profile NewProfile
   ```

Configuring Dynamic Authentication for VLAN Interfaces

You can use dynamic profiles, in conjunction with RADIUS, to dynamically create logical VLAN interfaces in the default logical system and in a specified routing instance. As DHCP clients in the same VLAN become active, corresponding interfaces are assigned to any specified routing instances. You can also dynamically create an underlying VLAN interface for incoming subscribers, associate interfaces created on this VLAN with the default logical system and a specified routing instance, and define RADIUS authentication values for the dynamically created interfaces.

Before you configure dynamic VLAN authentication, configure DHCP Local Server or DHCP Relay over which you want the dynamic VLAN interfaces to function.

For information about DHCP Local Server or DHCP Relay, see:

- *Extended DHCP Local Server Overview*
- *Extended DHCP Relay Agent Overview*

NOTE: You can also configure dynamically created VLAN interfaces over PPP or PPPoE interfaces. For information about how to configure PPP or PPPoE, see *Dynamic Profiles for PPP Subscriber Interfaces Overview* or *Subscriber Interfaces and PPPoE Overview*.

To configure dynamic authentication for dynamically created VLAN interfaces:

1. Configure an access profile that contains the appropriate accounting order, authentication order, and server access values.

   For information about how to configure an access profile, RADIUS accounting, RADIUS statistics, and how to define RADIUS server access, see:

   - *Configuring an Access Profile for Subscriber Management*
   - *Specifying the Authentication and Accounting Methods for Subscriber Access*
   - *Configuring Per-Subscriber Session Accounting*
   - *Configuring Router or Switch Interaction with RADIUS Servers*

2. Configure a dynamic profile that uses the default logical system and creates specific routing instances to contain dynamically created VLAN interfaces.

   See "Configuring a VLAN Dynamic Profile That Associates VLAN Interfaces with Separate Routing Instances" on page 29.

3. Define the VLAN physical interface for automatic configuration.

   See the following topics:

   - *Enabling VLAN Tagging*
   - Configuring Which VLAN Ethernet Packet Types Dynamic Profiles Can Accept on page 40
   - Configuring VLAN Ranges for Use with Dynamic Profiles on page 44
   - Configuring an Authentication Password for VLAN or Stacked VLAN Ranges on page 43
   - Configuring VLAN Interface Username Information for AAA Authentication on page 56

4. Associate an access profile to the VLAN interface.

   See *Attaching Access Profiles*.

5. Associate a dynamic profile to the VLAN interface.

   See "Configuring VLAN Interfaces to Use Dynamic Profiles" on page 38.

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3

Configuring Subscriber Packet Types to Trigger VLAN Authentication

By default, VLAN authentication is triggered by any of the packet types specified with the **accept** statement in the dynamic profile that instantiates the VLAN and subscriber interfaces. For certain business cases, you may want a more generic dynamic profile that includes several packet types, but in some situations want the VLAN to be authenticated for only a subset of your customers. You can use the **packet-types** statement to specify the desired subset.

To limit triggering of VLAN authentication to a subset of accepted packet types:

- Specify one or more packet types that you want to trigger VLAN authentication.

  [edit interfaces *interface-name* auto-configure vlan-ranges authentication]
  user@host# **set** packet-types **[*packet-type*]**

For example, the following partial configuration shows how to specify that IP, IPv6, and PPPoE packet types trigger the creation of autoconfigured, single-tagged VLANs, but only IP and IPv6 packets trigger authentication:

1. Access the VLAN dynamic profile for which you want to configure VLAN ranges.

   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# **edit** dynamic-profile **VLAN-PROF-1**

2. Specify the VLAN ranges for the VLAN dynamic profile.

   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF-1]
   user@host# **set** ranges **any**

3. Specify the VLAN packet types accepted by the VLAN dynamic profile.

   [edit interfaces ge-0/0/0 auto-configure vlan-ranges dynamic-profile VLAN-PROF-1]
   user@host# **set** accept **[inet inet6 pppoe]**

4. Specify the subset of those packet types that you want to trigger VLAN authentication.

   [edit interfaces ge-0/0/0 auto-configure vlan-ranges authentication]
   user@host# **set** packet-types **[inet inet6]**

Related Documentation

- *Subscriber Packet Type Authentication Triggers for Dynamic VLANs*
- Configuring VLAN Dynamic Profiles on page 24
- Configuring VLAN Interfaces to Use Dynamic Profiles on page 38
- Configuring the VLAN Ethernet Packet Type for Single-Tag VLAN Dynamic Profiles on page 40
- Configuring the VLAN Ethernet Packet Type for Stacked VLAN Dynamic Profiles on page 41

Configuring VLAN Interface Username Information for AAA Authentication

You can define interface information that is included in the username that is subsequently passed to the external AAA authentication service (for example, RADIUS) when creating dynamic VLANs or stacked VLANs. The AAA authentication service uses this information to authenticate the VLAN or stacked VLAN physical interface. After the interface is authenticated, the AAA service can send the required routing instance values to the system for use in dynamically creating VLAN or stacked VLAN interfaces.

NOTE: The following example configures username information on VLANs. However, you can also configure dynamic authentication on stacked VLANs by configuring the same statements at the **[edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication]** hierarchy level.

To configure VLAN interface username information:

1. Access the interface over which you want to configure username information.

   ```
   user@host# edit interfaces ge-0/0/0
   ```

2. Edit the auto-configure stanza.

   ```
   [edit interfaces ge-0/0/0]
   user@host# edit auto-configure
   ```

3. Edit the vlan-ranges stanza.

   ```
   [edit interfaces ge-0/0/0 auto-configure]
   user@host# edit vlan-ranges
   ```

4. Edit the authentication stanza.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit authentication
   ```

5. Edit the username-include stanza.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges]
   user@host# edit username-include
   ```

6. Specify the username statements that you want the AAA authentication service to use to authenticate the username.

   ```
   [edit interfaces ge-0/0/0 auto-configure vlan-ranges authentication username-include]
   user@host# set delimiter
   ```

Related Documentation

- Configuring Dynamic Authentication for VLAN Interfaces on page 53
- Option 82 Suboptions in Authentication Usernames for Autosense VLANs on page 57

Option 82 Suboptions in Authentication Usernames for Autosense VLANs

You can specify the Option 82 suboptions that are concatenated with the username during the authentication process for autosense VLANs. The option 82 value used in creating the username is based on the option 82 value that is encoded in the incoming DHCP discover packet.

You can specify either, both, or neither of the Agent Circuit ID (suboption 1) and the Agent Remote ID (suboption 2). If you specify both, the Agent Circuit ID is supplied first, followed by a delimiter, and then the Agent Remote ID. If you specify that neither suboption is supplied, the raw payload of Option 82 from the PDU is concatenated to the username. The use of Option 82 suboptions is supported for DHCPv4 discover packets only.

Related Documentation

- Configuring VLAN Interface Username Information for AAA Authentication on page 56

Option 18 and Option 37 in Authentication Usernames for DHCPv6 Autosense VLANs

For DHCPv4, Option 82 has suboptions containing the ACI and ARI that are concatenated with the username during the authentication process for autosense (dynamic) VLANs. For DHCPv6, the relay agent uses Options 18 and Option 37 to convey the ACI and ARI, respectively. You can include these options in the username to generate unique usernames that identify subscribers for authentication in DHCPv6 dynamic VLANs.

A DHCPv6 Solicit message encapsulated with a Relay-Forward message header and one without the Relay-Forward message header are eligible for dynamic VLAN creation when you configure the DHCPv6 packet type for autosensing. Options 18 and Option 37 are provided in the Relay-Forward message header and are extracted only from this header and not from the options within the DHCPv6 Solicit message. In addition, if the DHCPv6 Solicit message is encapsulated in multiple Relay-Forward message headers, only the option values from the innermost Relay-Forward message header are used for username authentication. If these options are sent by the client or DHCPv6 relay agent, and if dynamic VLAN authentication is configured to use these options in the username, then the options are included in the username for authentication. If either of these options is not sent by the client or DHCPv6 relay agent, or if the dynamic VLAN authentication is not configured to use the option in the username, the username is constructed without the option.

To include Option 18 or Option 37 in the username for DHCPv6 dynamic VLANs, include the **option-18** and **option-37** statements at the **[edit interfaces** *interface-name* **auto-configure** vlan-ranges authentication username-include**]** hierarchy level. To include Options 18 or Option 37 in the username for stacked VLANs, include **option-18** and **option-37** statements at the **[edit interfaces** *interface-name* **auto-configure** stacked-vlan-ranges authentication username-include**]** hierarchy level.

Related Documentation

- Configuring VLAN Interface Username Information for AAA Authentication on page 56
- username-include on page 146
- option-18 on page 130

- option-37 on page 131
- Configuring Which VLAN Ethernet Packet Types Dynamic Profiles Can Accept on page 40

Automatically Removing VLANs with No Subscribers

You can always clear or delete subscriber VLANs manually. However, you can also configure the interface to automatically remove dynamic subscriber VLANs when no client sessions (for example, DHCP or PPPoE) exist on the VLAN.

When configuring automatic removal of dynamic subscriber VLANs, keep the following in mind:

- You can configure automatic VLAN removal only on individual physical interfaces. You cannot configure the feature globally.
- Automatic VLAN removal is not supported for use on Layer 2 Wholesale interfaces. See *Layer 2 and Layer 3 Wholesale Overview*.
- PPPoE subscriber interfaces require the use of a dynamic profiles when configured over dynamic VLANS. However, dynamic profiles are not required for use with DHCP subscriber interfaces that use underlying dynamic VLANs. Because the remove-when-no-subscribers functionality triggers when no dynamic client sessions exist on a dynamic VLAN, automatic removal of underlying dynamic VLANs is not supported when DHCP subscriber interfaces are not created using dynamic profiles.
- The **maintain-subscriber** statement and **remove-when-no-subscribers** statement are mutually exclusive. When the router is configured to maintain subscribers, you cannot also specify that dynamically configured VLAN interfaces are removed when no subscribers exist.
- If PPPoE subscriber session lockout is also configured, the router does not remove the unused subscriber VLAN until the lockout time has expired for each client undergoing lockout on the underlying interface.

To configure automatic removal of subscriber VLANs when no client sessions exist on the VLAN:

1. Access the interface for which you want to enable automatic removal of subscriber VLANs.

   ```
   user@host# edit interfaces ge-1/1/1
   ```

2. Access the interface automatic configuration hierarchy.

   ```
   [edit interfaces ge-1/1/1]
   user@host# edit auto-configure
   ```

3. Enable subscriber VLAN removal with the **remove-when-no-subscribers** statement.

   ```
   [edit interfaces ge1/1/1 auto-configure]
   user@host# set remove-when-no-subscribers
   ```

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3
- Configuring VLAN Interfaces to Use Dynamic Profiles on page 38
- *Layer 2 and Layer 3 Wholesale Overview*
- *Layer 2 Wholesale Network Topology Overview*
- *PPPoE Subscriber Session Lockout Overview*

Configuring Ethernet OAM Support for Service VLANs with Double-Tagged Customer VLANs

On MX Series routers with MPC/MIC interfaces, you can enable propagation of the Ethernet IEEE 802.1ag Operation, Administration, and Maintenance (OAM) state of a static single-tagged service VLAN (S-VLAN) to the dynamic or static double-tagged customer VLAN (C-VLAN) that has the same S-VLAN (outer) tag as the S-VLAN, and, by extension, to subscriber interfaces configured on the C-VLAN. The static S-VLAN logical interface must be configured on a Gigabit Ethernet, 10-Gigabit Ethernet, or aggregated Ethernet physical interface.

Before you begin:

- Make sure the static single-tagged S-VLAN logical interface is configured with the Ethernet 802.1ag OAM connectivity fault management (CFM) continuity check protocol.

  See *IEEE 802.1ag OAM Connectivity Fault Management Overview*.

To enable propagation of the Ethernet OAM state of a static single-tagged S-VLAN to dynamic or static double-tagged C-VLAN logical interfaces:

- Configure a Gigabit Ethernet (ge), 10-Gigabit Ethernet (xe), or aggregated Ethernet (ae) physical interface to propagate the S-VLAN Ethernet OAM state to C-VLAN logical interfaces that have the same S-VLAN (outer) tag as the S-VLAN interface.

  ```
  [edit]
  user@host# set interfaces interface-name-fpc/pic/port oam-on-svlan
  ```

  For example, the following statement enables propagation of the Ethernet OAM state of a static single-tagged S-VLAN on Gigabit Ethernet interface ge-1/0/5 to a dynamic or static double-tagged C-VLAN logical interface with the same S-VLAN (outer) tag as the S-VLAN interface.

  ```
  [edit]
  user@host# set interfaces ge-1/0/5 oam-on-svlan
  ```

  Including the **oam-on-svlan** statement when you configure a Gigabit Ethernet, 10-Gigabit Ethernet, or aggregated Ethernet physical interface causes the router to bring down both of the following when the CFM continuity check protocol detects that the OAM state of the S-VLAN logical interface is down:

  - All dynamic or static double-tagged C-VLANs on the S-VLAN interface that have the same S-VLAN (outer) tag as the S-VLAN interface.

- All DHCP, IP demultiplexing (IP demux), and PPPoE logical subscriber interfaces configured on the associated C-VLANs.

Example: Gigabit Ethernet Interface with Static S-VLAN, Dynamic C-VLAN, and Dynamic PPPoE Subscriber Interfaces

The following example shows a dynamic subscriber access configuration that uses the **oam-on-svlan** statement on a Gigabit Ethernet interface. This example configures Gigabit Ethernet physical interface ge-1/0/5 with a static single-tagged S-VLAN logical interface (ge-1/0/5.1) that runs the Ethernet 802.1ag OAM CFM continuity check protocol. A dynamic profile named double-vlans creates a dynamic double-tagged C-VLAN interface, and a dynamic profile named pppoe-profile creates dynamic PPPoE subscriber interfaces on the C-VLAN interface. The **oam-on-svlan** statement for ge-1/0/5 propagates the Ethernet OAM state of S-VLAN interface ge-1/0/5.1 to the C-VLAN interface and the dynamic PPPoE subscriber interfaces.

For clarity, the configuration is divided into five steps.

1. Configure a dynamic profile named double-vlans that defines a dynamic double-tagged C-VLAN logical interface.

```
[edit]
dynamic-profiles {
  double-vlans {
    interfaces {
      "$junos-interface-ifd-name" {
        unit "$junos-interface-unit" {
          vlan-tags outer "$junos-stacked-vlan-id" inner "$junos-vlan-id";
          encapsulation ppp-over-ether;
          pppoe-underlying-options {
            dynamic-profile pppoe-profile;
          }
        }
      }
    }
  }
}
```

2. Configure a dynamic profile named pppoe-profile that defines dynamic PPPoE subscriber interfaces on the C-VLAN.

```
[edit]
dynamic-profiles {
  pppoe-profile {
    interfaces {
      pp0 {
        unit "$junos-interface-unit" {
          pppoe-options {
            underlying-interface "$junos-underlying-interface";
            server;
          }
```

```
            family inet {
              unnumbered-address lo0.0;
            }
          }
        }
      }
    }
  }
```

3. Configure Gigabit Ethernet physical interface ge-1/0/5.

```
[edit]
interfaces {
  ge-1/0/5 {
    description "connect to remote router";
    flexible-vlan-tagging;
    oam-on-svlan;
    unit 1 {
      vlan-id 1;
    }
    auto-configure {
      stacked-vlan-ranges {
        dynamic-profile double-vlans {
          accept any;
          ranges {
            any,any;
          }
        }
      }
    }
  }
  lo0 {
    unit 0 {
      family inet {
        address 100.1.1.1/32 {
          primary;
        }
      }
    }
  }
}
```

The preceding example in Step 3 configures a static, single-tagged S-VLAN logical interface (ge-1/0/5.1) with VLAN ID 1, and references the double-vlans dynamic profile to create a dynamic double-tagged C-VLAN logical interface with S-VLAN (outer) tag **any** and C-VLAN (inner) tag **any**. The tag value **any** represents the entire range of VLAN IDs or S-VLAN IDs, including VLAN ID 1.

Because the C-VLAN outer tag (**any**) matches the S-VLAN tag VLAN ID 1, the **oam-on-svlan** statement in the configuration causes the router to propagate the Ethernet OAM state of S-VLAN ge-1/0/5.1 to the dynamic double-tagged C-VLAN logical interface (created by the double-vlans dynamic profile) and, by extension, to the dynamic PPPoE subscriber interfaces on the C-VLAN (created by the pppoe-profile dynamic profile).

4. Configure the Ethernet 802.1ag OAM CFM continuity check protocol on the static S-VLAN interface (ge-1/0/5.1).

```
[edit]
protocols {
    oam {
        ethernet {
            connectivity-fault-management {
                action-profile myDefault {
                    default-actions {
                        interface-down;
                    }
                }
                maintenance-domain md1 {
                    level 1;
                    maintenance-association ma1 {
                        continuity-check {
                            interval 1s;
                        }
                        mep 100 {
                            interface ge-1/0/5.1;
                            direction down;
                            remote-mep 101 {
                                action-profile myDefault;
                            }
                        }
                    }
                }
            }
        }
    }
}
```

   If the CFM continuity check protocol detects that the Ethernet OAM state of S-VLAN interface ge-1/0/5.1 is down, the **interface-down** action in the myDefault action profile causes the router to bring down both of the following:

   - The dynamic double-tagged C-VLAN logical interface that has the same S-VLAN (outer) tag as S-VLAN interface ge-1/0/5.1
   - The dynamic PPPoE subscriber interfaces configured on the dynamic C-VLAN interface

5. Create a PPP access profile.

   For brevity, this configuration is only partially shown. The missing portions of the configuration are replaced with ellipses (...).

```
[edit]
access {
    ...
    profile ppp-authenticator {
        ...
    }
}
```

Related Documentation

- Ethernet OAM Support for Service VLANs Overview on page 4
- *IEEE 802.1ag OAM Connectivity Fault Management Overview*

Example: Configuring VXLAN on MX Series Routers

Virtual Extensible Local Area Network (VXLAN) is a Layer 3 encapsulation protocol that enables MX Series routers to push Layer 2 or Layer 3 packets through a VXLAN tunnel to a virtualized data center or the Internet. Communication is established between two virtual tunnel endpoints (VTEPs). VTEPs encapsulate the virtual machine traffic into a VXLAN header and strip off the encapsulation.

This example shows how to configure VXLAN on MX Series routers using switch options in a default bridge domain.

- Requirements on page 63
- Overview on page 63
- Configuring VXLAN on MX Series Routers on page 64
- Verification on page 70

Requirements

This example uses the following hardware and software components:

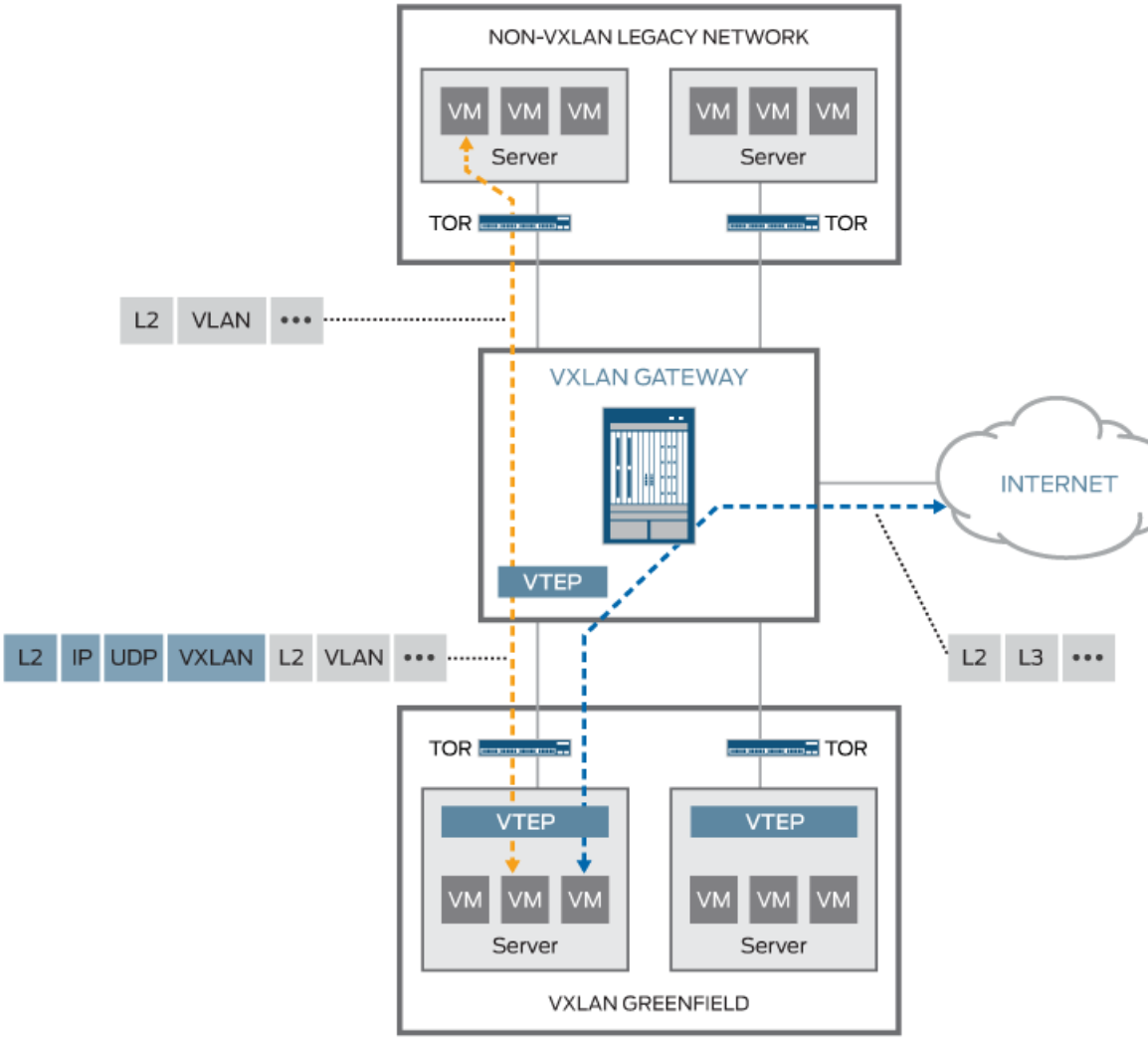
- An MX Series router
- A VXLAN capable peer router
- Junos OS Release 14.1

Overview

In this example, VXLAN is configured to run on a default bridge domain. VTEP interfaces sources are configured to the loopback address, and VLAN groups are configured under bridge domains with VXLAN enabled. Interfaces are configured for VLAN tagging and encapsulation, and IRB is enabled. OSPF and PIM protocols are configured to facilitate unicast and multicast routing. The chassis is configured for GRES and enhanced IP services.

Topology

Figure 1: VXLAN Topology



Configuring VXLAN on MX Series Routers

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, and then copy and paste the commands into the CLI at the **[edit]** hierarchy level.

```
set switch-options vtep-source-interface lo0.0
set bridge-domains vlan-5 vxlan vni 100
set bridge-domains vlan-5 vxlan multicast-group 239.1.1.1
set bridge-domains vlan-5 vlan-id 100
set bridge-domains vlan-5 routing-interface irb.0
set bridge-domains vlan-5 interface xe-1/0/0.0
```

```
set bridge-domains vlan-6 vxlan vni 200
set bridge-domains vlan-6 vxlan multicast-group 239.1.1.1
set bridge-domains vlan-6 vlan-id 200
set bridge-domains vlan-6 routing-interface irb.1
set bridge-domains vlan-6 interface xe-2/0/0.0
set interfaces xe-1/0/0 vlan-tagging
set interfaces xe-1/0/0 encapsulation flexible-ethernet-services
set interfaces xe-1/0/0 unit 0 encapsulation vlan-bridge
set interfaces xe-1/0/0 unit 0 vlan-id 100
set interfaces xe-2/0/0 vlan-tagging
set interfaces xe-2/0/0 encapsulation flexible-ethernet-services
set interfaces xe-2/0/0 unit 0 encapsulation vlan-bridge
set interfaces xe-2/0/0 unit 0 vlan-id 200
set interface irb unit 0 family inet address 5.5.5.1/24
set interface irb unit 1 family inet address 6.6.6.1/24
set interfaces lo0 unit 0 family inet address 3.3.3.3/32
set protocols ospf area 0.0.0.0 interface ge-8/3/8.0
set protocols ospf area 0.0.0.0 interface lo0.0
set protocols ospf area 0.0.0.0 interface xe-0/1/3.0
set protocols ospf area 0.0.0.0 interface ge-8/3/2.0
set protocols pim rp static address 10.2.1.3
set protocols pim interface lo0.0 mode bidirectional-sparse
set protocols pim interface ge-8/3/8.0 mode bidirectional-sparse
set protocols pim interface xe-0/1/3.0 mode bidirectional-sparse
set protocols pim interface ge-8/3/2.0 mode bidirectional-sparse
set chassis redundancy graceful-switchover
set chassis aggregated-devices ethernet device-count 10
set chassis fpc 1 pic 0 tunnel-services bandwidth 10g
set chassis network-services enhanced-ip
```

Configuring VXLAN

Step-by-Step Procedure

The following example show how to set up a basic VXLAN configuration with default bridge domains and switch options. To configure VXLAN on an MX Series router, follow these steps:

1. Configure VTEP interface sources under **switch-options** for the default-switch.

   ```
   [edit]
   user@router# set switch-options vtep-source-interface lo0.0
   ```

2. Set up a VLAN group named **vlan-5** and set its VXLAN Network Identifier (VNI) to 100.

   ```
   [edit]
   user@router# set bridge-domains vlan-5 vxlan vni 100
   ```

3. Configure the **vlan-5** multicast group address for VXLAN.

   ```
   [edit]
   user@router# set bridge-domains vlan-5 vxlan multicast-group 239.1.1.1
   ```

4. Set the VLAN ID to 100 for **vlan-5**.

   ```
   [edit]
   user@router# set bridge-domains vlan-5 vlan-id 100
   ```

5. Configure integrated bridging and routing (IRB) for **vlan-5**.

```
[edit]
user@router# set bridge-domains vlan-5 routing-interface irb.0
```

6. Assign the xe-1/0/0.0 interface to **vlan-5**.

```
[edit]
user@router# set bridge-domains vlan-5 interface xe-1/0/0.0
```

7. Set up a VLAN group named **vlan-6** and set its VXLAN Network Identifier (VNI) to 200.

```
[edit]
user@router# set bridge-domains vlan-6 vxlan vni 200
```

8. Configure the **vlan-6** multicast group address for VXLAN.

```
[edit]
user@router# set bridge-domains vlan-6 vxlan multicast-group 239.1.1.1
```

9. Set the VLAN ID to 100 for **vlan-6**.

```
[edit]
user@router# set bridge-domains vlan-6 vlan-id 200
```

10. Configure IRB for **vlan-6**.

```
[edit]
user@router# set bridge-domains vlan-6 routing-interface irb.1
```

11. Assign the xe-2/0/0.0 interface to **vlan-6**.

```
[edit]
user@router# set bridge-domains vlan-6 interface xe-2/0/0.0
```

12. Set up VLAN tagging for xe-1/0/0.

```
[edit]
user@router# set interfaces xe-1/0/0 vlan-tagging
```

13. Configure flexible Ethernet service encapsulation on xe-1/0/0.

```
[edit]
user@router# set interfaces xe-1/0/0 encapsulation flexible-ethernet-services
```

14. Set up VLAN bridging encapsulation for xe-1/0/0 unit 0 .

```
[edit]
user@router# set interfaces xe-1/0/0 unit 0 encapsulation vlan-bridge
```

15. Set the xe-1/0/0 unit 0 VLAN ID to 100.

```
[edit]
user@router# set interfaces xe-1/0/0 unit 0 vlan-id 100
```

16. Configure VLAN tagging for xe-2/0/0

```
[edit]
user@router# set interfaces xe-2/0/0 vlan-tagging
```

17. Set up flexible Ethernet service encapsulation on xe-2/0/0.

```
[edit]
user@router# set interfaces xe-2/0/0 encapsulation flexible-ethernet-services
```

18. Configure VLAN bridging encapsulation for xe-2/0/0 unit 0 .

```
[edit]
user@router# set interfaces xe-2/0/0 unit 0 encapsulation vlan-bridge
```

19. Set the xe-2/0/0 unit 0 VLAN ID to 200.

```
[edit]
user@router# set interfaces xe-2/0/0 unit 0 vlan-id 200
```

20. Configure the IRB unit 0 family inet address.

```
[edit]
user@router# set interface irb unit 0 family inet address 5.5.5.1/24
```

21. Configure the IRB unit 1 family inet address.

```
[edit]
user@router# set interface irb unit 1 family inet address 6.6.6.1/24
```

22. Set the family inet address for the loopback unit 0.

```
[edit]
user@router# set interfaces lo0 unit 0 family inet address 3.3.3.3/32
```

23. Set up OSPF for the ge-8/3/8.0 interface.

```
[edit]
user@router# set protocols ospf area 0.0.0.0 interface ge-8/3/8.0
```

24. Configure OSPF for the loopback interface.

```
[edit]
user@router# set protocols ospf area 0.0.0.0 interface lo0.0
```

25. Set up OSPF for the xe-0/1/3.0 interface.

```
[edit]
user@router# set protocols ospf area 0.0.0.0 interface xe-0/1/3.0
```

26. Configure OSPF for the ge-8/3/2.0 interface.

```
[edit]
user@router# set protocols ospf area 0.0.0.0 interface ge-8/3/2.0
```

27. Set up the static address for the physical interface module (PIM) rendezvous point (RP).

```
[edit]
user@router# set protocols pim rp static address 10.2.1.3
```

28. Configure the loopback interface to bidirectional sparse mode for the PIM protocol.

```
[edit]
user@router# set protocols pim interface lo0.0 mode bidirectional-sparse
```

29. Set the ge-8/3/8.0 interface to bidirectional sparse mode for the PIM protocol.

```
[edit]
user@router# set protocols pim interface ge-8/3/8.0 mode bidirectional-sparse
```

30. Configure the xe-0/1/3.0 interface to bidirectional sparse mode for the PIM protocol.

```
[edit]
user@router# set protocols pim interface xe-0/1/3.0 mode bidirectional-sparse
```

31. Set the ge-8/3/2.0 interface to bidirectional sparse mode for the PIM protocol.

```
[edit]
user@router# set protocols pim interface ge-8/3/2.0 mode bidirectional-sparse
```

32. Configure redundant graceful switchover on the chassis.

```
[edit]
user@router# set chassis redundancy graceful-switchover
```

33. Set the aggregated ethernet device count to 10.

```
[edit]
user@router# set chassis aggregated-devices ethernet device-count 10
```

34. Configure the tunnel services bandwidth for FPC 1/PIC 0.

```
[edit]
user@router# set chassis fpc 1 pic 0 tunnel-services bandwidth 10g
```

35. Enable enhanced IP for network services on the chassis.

```
[edit]
user@router# set chassis network-services enhanced-ip
```

Results

From configuration mode, confirm your configuration by entering the following commands. If the output does not display the intended configuration, repeat the instructions in this example to correct the configuration.

user@router# show switch-options

```
switch-options {
  vtep-source-interface lo0.0;
}
```

user@router# show bridge-domains

```
bridge-domains {
  vlan-5 {
    vxlan {
      vni 100;
      multicast-group 239.1.1.1;
    }
    vlan-id 100;
    routing-interface irb.0;
    interface xe-1/0/0.0;
  }
```

```
    vlan-6 {
      vxlan {
        vni 200;
        multicast-group 239.2.1.1;
      }
      vlan-id 200;
      routing-interface irb.1;
      interface xe-2/0/0.0;
    }
  }
```

user@router# show interfaces

```
  interfaces {
    xe-1/0/0 {
      vlan-tagging;
      encapsulation flexible-ethernet-services;
      unit 0 {
        encapsulation vlan-bridge;
        vlan-id 100;
      }
    }
    xe-2/0/0 {
      vlan-tagging;
      encapsulation flexible-ethernet-services;
      unit 0 {
        encapsulation vlan-bridge;
        vlan-id 200;
      }
    }
    irb {
      unit 0 {
        family inet {
          address 5.5.5.1/24;
        }
      }
      unit 1 {
        family inet {
          address 6.6.6.1/24;
        }
      }
    }
    lo0 {
      unit 0 {
        family inet {
          address 3.3.3.3/32;
        }
      }
    }
  }
```

user@router# show protocols ospf

```
  area 0.0.0.0 {
    interface ge-8/3/8.0;
    interface lo0.0;
    interface xe-0/1/3.0;
    interface ge-8/3/2.0;
```

```
  }
user@router# show protocols pim
  rp {
    static {
      address 10.2.1.3;
    }
  }
user@router# show chassis
  redundancy {
    graceful-switchover;
  }
  aggregated-devices {
    ethernet {
      device-count 10;
    }
  }
  fpc 1 {
    pic 0 {
      tunnel-services {
        bandwidth 10g;
      }
    }
  }
  network-services enhanced-ip;
```

Verification

Confirm that the configuration is working properly.

- Verifying Reachability on page 70
- Verifying VXLAN on page 71

Verifying Reachability

Purpose Verify that the network is up and running with the proper interfaces and routes installed.

Action

```
user@router> show interfaces terse irb
Interface               Admin Link Proto    Local                 Remote
irb                     up    up
irb.0                   up    up   inet     5.5.5.1/24
                                  multiservice
irb.1                   up    up   inet     6.6.6.1/24
                                  multiservice
```

```
user@router> ping 5.5.5.1/24
PING 5.5.5.1 (5.5.5.1): 56 data bytes
64 bytes from 5.5.5.1: icmp_seq=0 ttl=64 time=0.965 ms
64 bytes from 5.5.5.1: icmp_seq=1 ttl=64 time=0.960 ms
64 bytes from 5.5.5.1: icmp_seq=2 ttl=64 time=0.940 ms
^C
--- 1.1.1.1 ping statistics ---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.940/0.955/0.965/0.011 ms
```

Meaning Use the **show interfaces terse irb** command to verify that the IRB interface has been properly configured. The **irb.0** and **irb.1** interfaces should display the proper multiservice inet addresses.

Use the **ping** command to confirm that the network is connected to the IRB multiservice address.

Verifying VXLAN

Purpose Verify that VXLAN is working and the proper protocols are enabled.

Action

```
user@router> show interfaces vtep
Physical interface: vtep, Enabled, Physical link is Up
  Interface index: 133, SNMP ifIndex: 575
  Type: Software-Pseudo, Link-level type: VxLAN-Tunnel-Endpoint, MTU: 1600, Speed:
 Unlimited
  Device flags   : Present Running
  Interface flags: SNMP-Traps
  Link type      : Full-Duplex
  Link flags     : None
  Last flapped   : Never
    Input packets : 0
    Output packets: 0

  Logical interface vtep.32768 (Index 334) (SNMP ifIndex 607)
    Flags: Up SNMP-Traps Encapsulation: ENET2
    VXLAN Endpoint Type: Source, VXLAN Endpoint Address: 10.255.187.32, L2 Routing
 Instance: default-switch, L3 Routing Instance: default
    Input packets : 0
    Output packets: 0
```

```
user@router> show l2-learning vxlan-tunnel-end-point remote mac-table
MAC flags (S -static MAC, D -dynamic MAC, L -locally learned, C -Control MAC
           SE -Statistics enabled, NM -Non configured MAC, R -Remote PE MAC)

Logical system   : <default>
Routing instance : default-switch
 Bridging domain : vlan-5+100, VLAN : 100, VNID : 100
 Bridging domain : vlan-6+200, VLAN : 200, VNID : 200
```

```
user@router> show l2-learning vxlan-tunnel-end-point source
Logical System Name       Id  SVTEP-IP         IFL   L3-Idx
<default>                 0   10.255.187.32    lo0.0    0
    L2-RTT                   Bridge Domain              VNID     MC-Group-IP
    default-switch           vlan-5+100                 100      239.1.1.1

    default-switch           vlan-6+200                 200      239.1.1.1
```

Meaning

Use the **show interface vtep** command to displays information about VXLAN endpoint configuration. Make sure the routing instance is assigned to the default-switch..

Use the **show l2-learning vxlan-tunnel-end-point remote mac-table** command to confirm that the bridging domain VLAN groups were configured correctly.

Use the **show l2-learning vxlan-tunnel-end-point source** command to confirm the multicast IP addresses for bridging domain VLAN groups.

Related Documentation

- Understanding VXLANs on page 17
- *show bridge mac-table*
- *show vpls mac-table*

CHAPTER 5

Configuration Tasks for Agent Circuit Identifier-Based Dynamic VLANs

- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- Defining Agent Circuit Identifier Interface Sets on page 75
- Configuring Dynamic Underlying VLAN Interfaces to Use Agent Circuit Identifier Information on page 78
- Configuring Static Underlying VLAN Interfaces to Use Agent Circuit Identifier Information on page 79
- Configuring Dynamic VLAN Subscriber Interfaces Based on Agent Circuit Identifier Information on page 80
- Adjusting the CoS Shaping Rate and Overhead Accounting Parameters for Agent Circuit Identifier-Based Dynamic VLANs on page 82

Configuring Dynamic VLANs Based on Agent Circuit Identifier Information

On MX Series routers with Modular Port Concentrators/Modular Interface Cards (MPCs/MICs) that face the access side of the network, you can configure dynamic VLAN subscriber interfaces based on agent circuit identifier (ACI) information, also known as *ACI-based dynamic VLANs*, for DHCP and PPPoE subscribers. To do so, you create an *ACI interface set*, which is a logical collection of subscriber interfaces that originate at the same household or on the same access-loop port, and then reference the ACI interface set in the dynamic profile for a PPPoE or IP demultiplexing (IP demux) logical subscriber interface.

Grouping subscriber interfaces into ACI interface sets to create ACI-based dynamic VLANs facilitates application of subscriber-based services, such as class of service (CoS) and interface-shared filters, to all of the subscriber interfaces from the same household.

Before you begin:

1. Configure the underlying physical interface for single-tag VLANs or stacked (dual-tag) VLANs.

   See the following topics:

   - *802.1Q VLANs Overview*

- Configuring VLAN Dynamic Profiles on page 24
- Configuring VLAN Interfaces to Use Dynamic Profiles on page 38

2. Create a dynamic profile that defines the logical subscriber interface.

   See the following topics:

   - *Configuring a Basic Dynamic Profile*
   - *Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles*
   - *Configuring Dynamic Subscriber Interfaces Using IP Demux Interfaces in Dynamic Profiles*

To configure a dynamic VLAN subscriber interface based on ACI information:

1. Create a dynamic profile that defines the dynamic ACI interface set.

   See "Defining Agent Circuit Identifier Interface Sets" on page 75.

2. (Optional) Include attributes for PPPoE, CoS, and interface-shared filters in the dynamic profile for the ACI interface set.

   See "Defining Agent Circuit Identifier Interface Sets" on page 75.

3. (Optional) In the dynamic profile for the ACI interface set, configure the router to use the Actual-Data-Rate-Downstream VSA [26-130] or Access-Loop-Encapsulation VSA [26-144] value in PPPoE control packets to adjust CoS shaping-rate and overhead-accounting attributes at a per-household level.

   See "Adjusting the CoS Shaping Rate and Overhead Accounting Parameters for Agent Circuit Identifier-Based Dynamic VLANs" on page 82.

4. Dynamically or statically configure the underlying VLAN logical interface to enable dynamic subscriber interface creation based on ACI information.

   - For dynamic underlying VLAN interfaces, see "Configuring Dynamic Underlying VLAN Interfaces to Use Agent Circuit Identifier Information" on page 78.
   - For static underlying VLAN interfaces, see "Configuring Static Underlying VLAN Interfaces to Use Agent Circuit Identifier Information" on page 79.

5. Associate the dynamic ACI interface set with the dynamic PPPoE or dynamic IP demux logical subscriber interface.

   See "Configuring Dynamic VLAN Subscriber Interfaces Based on Agent Circuit Identifier Information" on page 80.

6. (Optional) In the dynamic profile for the PPPoE (**pp0**) subscriber interface, configure the router to use the Actual-Data-Rate-Downstream VSA [26-130] or Access-Loop-Encapsulation VSA [26-144] value in PPPoE control packets to adjust CoS shaping-rate and overhead-accounting attributes at a per-subscriber level.

   See "Adjusting the CoS Shaping Rate and Overhead Accounting Parameters for Agent Circuit Identifier-Based Dynamic VLANs" on page 82.

7. (Optional) Verify the ACI-based dynamic VLAN subscriber interface configuration.

See "Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration" on page 155.

8. (Optional) Clear the ACI interface set from the router when the interface set no longer has any active subscriber sessions.

   See "Clearing Agent Circuit Identifier Interface Sets" on page 156.

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Overview on page 9
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11
- Agent Circuit Identifier-Based Dynamic VLANs Bandwidth Management Overview on page 13
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155
- Clearing Agent Circuit Identifier Interface Sets on page 156

Defining Agent Circuit Identifier Interface Sets

To configure the router to create dynamic VLAN subscriber interfaces for DHCP and PPPoE subscribers based on agent circuit identifier (ACI) information, you must create a dynamic ACI interface set. An *ACI interface set* is a logical collection of subscriber interfaces that originate at the same household or on the same access-loop port.

Because DHCP and PPPoE traffic sent to the router from the same household carries the same ACI value in DHCP and PPPoE control packets, the router groups these subscriber interfaces into a single ACI interface set. Grouping subscriber interfaces into ACI interface sets facilitates application of attributes for PPPoE, class of service (CoS), and interface-shared filters to all of the subscriber interfaces from the same household.

To configure an ACI interface set in a dynamic profile:

1. Name the dynamic profile that defines the ACI interface set.

   ```
   [edit]
   user@host# edit dynamic-profiles profile-name
   ```

2. Specify that you want to configure the interfaces for the dynamic profile.

   ```
   [edit dynamic-profiles profile-name]
   user@host# edit interfaces
   ```

3. Configure the dynamic ACI interface set.

   ```
   [edit dynamic-profiles profile-name interfaces]
   user@host# edit interface-set $junos-interface-set-name
   ```

   You must use the **$junos-interface-set-name** predefined dynamic variable to represent the name of the ACI interface set. The **$junos-interface-set-name** variable is dynamically replaced with the actual ACI interface set name generated by the router when the first DHCP or PPPoE subscriber from that household logs in.

4. Include the interfaces for the dynamic ACI interface set.

```
[edit dynamic-profiles profile-name interfaces interface-set
  "$junos-interface-set-name"]
user@host# set interface $junos-interface-ifd-name
```

You must use the **$junos-interface-ifd-name** predefined dynamic variable to represent the name of the ACI interface set. The **$junos-interface-ifd-name** variable is dynamically replaced with the name of the interface on which the DHCP or PPPoE subscriber accesses the router.

NOTE: The **unit** *logical-unit-number* statement is not required in the dynamic profile at the **[edit dynamic-profiles** *profile-name* **interfaces interface-set** *interface-set-name* **interface** *interface-name***]** hierarchy level when you configure an ACI interface set.

5. (Optional) For dynamic PPPoE subscriber interfaces, configure the maximum number of dynamic PPPoE sessions that the router can activate for the ACI interface set.

```
[edit dynamic-profiles profile-name interfaces interface-set
  "$junos-interface-set-name"]
user@host# edit pppoe-underlying-options
[edit dynamic-profiles profile-name interfaces interface-set "$junos-interface-set-name"
  pppoe-underlying-options]
user@host# set max-sessions number
```

Issuing the **max-sessions** statement in a dynamic profile for an ACI interface set limits the maximum number of dynamic PPPoE sessions at the ACI interface set level from the same household.

6. (Optional) Apply attributes for CoS and interface filters to all subscriber interfaces belonging to the ACI interface set.

The following example shows the minimum dynamic profile required to define an ACI interface set named aci-vlan-set-profile. The **interface-set** stanza uses predefined dynamic variables to represent the interface set (**$junos-interface-set-name**) and the underlying physical interface (**$junos-interface-ifd-name**).

```
[edit dynamic-profiles aci-vlan-set-profile]
interfaces {
  interface-set "$junos-interface-set-name" {
    interface "$junos-interface-ifd-name";
  }
}
```

The following example shows a more complex dynamic profile for an ACI interface set named aci-vlan-set-profile-pppoe-cos. In addition to the required **interface-set** stanza, this profile includes optional attributes for PPPoE (**max-sessions** statement) and CoS. The router applies these PPPoE and CoS attributes to all subscriber interfaces from the same household, which is represented by the ACI interface set.

```
[edit dynamic-profiles aci-vlan-set-profile-pppoe-cos]
variables {
  ds1q1q2DP uid;
  ef1_dp uid;
```

```
}
  interfaces {
    interface-set "$junos-interface-set-name" {
      interface "$junos-interface-ifd-name";
      pppoe-underlying-options {
        max-sessions 3;
      }
    }
  }
  class-of-service {
    traffic-control-profiles {
      tcp2 {
        scheduler-map "$ds1q1q2DP";
        shaping-rate 50m;
        overhead-accounting bytes -20;
        guaranteed-rate 30m;
      }
    }
    interfaces {
      interface-set "$junos-interface-set-name" {
        output-traffic-control-profile tcp2;
      }
    }
    scheduler-maps {
      "$ds1q1q2DP" {
        forwarding-class ef scheduler "$ef1_dp";
      }
    }
    schedulers {
      "$ef1_dp" {
        transmit-rate percent 25;
        priority low;
      }
    }
  }
```

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Overview on page 9
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155
- Clearing Agent Circuit Identifier Interface Sets on page 156
- *Applying CoS Attributes to VLANs Using Agent-Circuit-Identifiers*
- *Example: Interface-Shared Filter Configuration*

Configuring Dynamic Underlying VLAN Interfaces to Use Agent Circuit Identifier Information

After you define the agent circuit identifier (ACI) interface set, you must configure the underlying VLAN interface to enable creation of dynamic VLAN subscriber interfaces based on ACI information. You can configure the underlying VLAN interface statically or dynamically.

This topic describes how to configure the underlying VLAN interface *dynamically*.

Before you begin:

- Create a dynamic profile that defines the underlying VLAN interface.

  See the following topics:

  - *Configuring a Basic Dynamic Profile*
  - Configuring VLAN Dynamic Profiles on page 24
  - Configuring VLAN Interfaces to Use Dynamic Profiles on page 38

To configure a dynamic underlying VLAN interface to use ACI information:

- In the dynamic profile for the underlying VLAN interface, associate the dynamic profile that defines the ACI interface set with the underlying VLAN interface.

  ```
  [edit dynamic-profiles profile-name]
  user@host# set interfaces interface-name unit logical-unit-number auto-configure
    agent-circuit-identifier dynamic-profile aci-interface-set-profile-name
  ```

  For example, the following statement in a dynamic profile named aci-vlan-underlying-profile-demux associates the dynamic underlying VLAN interface with dynamic profile aci-vlan-set-profile2 that defines the ACI interface set. You must use the predefined dynamic variable **$junos-interface-ifd-name** to represent the interface name, and **$junos-interface-unit** to represent the logical unit number.

  ```
  [edit dynamic-profiles aci-vlan-underlying-profile-demux]
  user@host# set interfaces “$junos-interface-ifd-name” unit “$junos-interface-unit”
    auto-configure agent-circuit-identifier dynamic-profile aci-vlan-set-profile2
  ```

The following example shows the dynamic configuration that uses this statement. This configuration enables the underlying dynamic IP demultiplexing (IP demux) VLAN interface to create dynamic subscriber interfaces based on ACI information by applying a single default ACI interface set dynamic profile (aci-vlan-set-profile2) to all households on the VLAN interface.

```
[edit dynamic-profiles aci-vlan-underlying-profile-demux]
interfaces {
  “$junos-interface-ifd-name” {
    unit "$junos-interface-unit" {
      auto-configure {
        agent-circuit-identifier {
          dynamic-profile aci-vlan-set-profile2;
        }
```

```
        }
        vlan-id "$junos-vlan-id";
        demux-options {
          underlying-interface “$junos-interface-ifd-name”;
        }
        family inet {
          unnumbered-address lo0.0 preferred-source-address 100.20.0.2;
        }
      }
    }
  }
```

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Overview on page 9
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155

Configuring Static Underlying VLAN Interfaces to Use Agent Circuit Identifier Information

After you define the agent circuit identifier (ACI) interface set, you must configure the underlying VLAN interface to enable creation of dynamic VLAN subscriber interfaces based on ACI information. You can configure the underlying VLAN interface statically or dynamically.

This topic describes how to configure the underlying VLAN interface *statically*.

To configure a static underlying VLAN interface to use ACI information:

- Associate the dynamic profile that defines the ACI interface set with the static underlying VLAN interface.

  ```
  [edit]
  user@host# set interfaces interface-name unit logical-unit-number auto-configure
    agent-circuit-identifier dynamic-profile aci-interface-set-profile-name
  ```

  For example, the following statement associates static Gigabit Ethernet VLAN interface ge-1/0/0.0 with the dynamic profile aci-vlan-set-profile that defines the ACI interface set.

  ```
  [edit]
  user@host# set interfaces ge-1/0/0 unit 0 auto-configure agent-circuit-identifier
    dynamic-profile aci-vlan-set-profile
  ```

The following example shows the static configuration that uses this statement. This configuration enables the underlying VLAN interface ge-1/0/0.0 to create dynamic subscriber interfaces based on ACI information by applying a single default ACI interface set dynamic profile (aci-vlan-set-profile) to all households on the VLAN interface.

```
[edit]
interfaces {
```

```
ge-1/0/0 {
  flexible-vlan-tagging;
  unit 0 {
    vlan-id 100;
    auto-configure {
      agent-circuit-identifier {
        dynamic-profile aci-vlan-set-profile;
      }
    }
  }
}
```

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Overview on page 9
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155

Configuring Dynamic VLAN Subscriber Interfaces Based on Agent Circuit Identifier Information

After you define the dynamic agent circuit identifier (ACI) interface set and enable creation of ACI-based dynamic VLAN subscriber interfaces on the underlying VLAN interface, you must complete the configuration by associating the ACI interface set with the PPPoE or IP demultiplexing (IP demux) subscriber interface in the dynamic profile for the subscriber interface.

Before you begin:

- Create a dynamic profile that defines the logical subscriber interface.

  See the following topics:

  - *Configuring a Basic Dynamic Profile*
  - *Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles*
  - *Configuring Dynamic Subscriber Interfaces Using IP Demux Interfaces in Dynamic Profiles*

To configure a dynamic VLAN subscriber interface based on ACI information:

- In the dynamic profile for the PPPoE or IP demux subscriber interface, associate the dynamic ACI interface set with the dynamic VLAN subscriber interface name (**pp0** or **demux0**) and logical unit number.

  ```
  [edit dynamic-profiles profile-name]
  user@host# set interfaces interface-set $junos-interface-set-name interface
    interface-name unit $junos-interface-unit
  ```

For example, the following statement in a dynamic profile named aci-vlan-pppoe-profile associates the dynamic ACI interface set with the dynamic **pp0** (PPPoE) logical subscriber interface. You must use the predefined dynamic variable **$junos-interface-set-name** to represent the name of the dynamic ACI interface set, and **$junos-interface-unit** to represent the logical unit number of the subscriber interface.

```
[edit dynamic-profiles aci-vlan-pppoe-profile]
user@host# set interfaces interface-set $junos-interface-set-name interface pp0 unit
  $junos-interface-unit
```

Similarly, the following statement in a dynamic profile named aci-vlan-demux-profile associates the dynamic ACI interface set (represented by **$junos-interface-set-name**) with the **demux0** (IP demux) logical subscriber interface.

```
[edit dynamic-profiles aci-vlan-demux-profile]
user@host# set interfaces interface-set $junos-interface-set-name interface demux0
  unit $junos-interface-unit
```

The following examples show the dynamic configurations that use each of these statements. The following sample configuration shows a dynamic profile named aci-vlan-pppoe-profile for an ACI-based dynamic PPPoE (**pp0**) subscriber interface for use by PPPoE subscribers.

```
[edit dynamic-profiles aci-vlan-pppoe-profile]
interfaces {
    interface-set "$junos-interface-set-name" {
        interface pp0 {
            unit "$junos-interface-unit";
        }
    }
    pp0 {
        unit "$junos-interface-unit" {
            ppp-options {
                chap;
                pap;
            }
            pppoe-options {
                underlying-interface "$junos-underlying-interface";
                server;
            }
            no-keepalives;
            family inet {
                unnumbered-address lo0.0;
            }
        }
    }
}
```

The following sample configuration shows a dynamic profile named aci-vlan-demux-profile for an ACI-based dynamic IP demux(**demux0**) subscriber interface for use by DHCP subscribers.

```
[edit dynamic-profiles aci-vlan-demux-profile]
interfaces {
    interface-set "$junos-interface-set-name" {
        interface demux0 {
```

```
            unit "$junos-interface-unit";
          }
        }
        demux0 {
          unit "$junos-interface-unit" {
            demux-options {
              underlying-interface "$junos-underlying-interface";
            }
            family inet {
              demux-source {
                $junos-subscriber-ip-address;
              }
              unnumbered-address lo0.0 preferred-source-address 100.20.200.202;
            }
          }
        }
      }
```

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Overview on page 9
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155
- Clearing Agent Circuit Identifier Interface Sets on page 156

Adjusting the CoS Shaping Rate and Overhead Accounting Parameters for Agent Circuit Identifier-Based Dynamic VLANs

You can configure the router to use either or both of the Actual-Data-Rate-Downstream [26-130] or Access-Loop-Encapsulation [26-144] DSL Forum vendor-specific attribute (VSA) values in PPPoE control packets to adjust the CoS shaping-rate and overhead-accounting attributes, respectively, for dynamic agent circuit identifier (ACI) interface sets and their associated ACI-based dynamic VLAN subscriber interfaces.

Before you begin:

- To configure adjustment of the CoS shaping rate and overhead accounting attributes on a per-household basis, create a dynamic profile that defines the dynamic ACI interface set.

  See "Defining Agent Circuit Identifier Interface Sets" on page 75.

- To configure adjustment of the CoS shaping rate and overhead accounting attributes on a per-subscriber basis, create a dynamic profile that defines the ACI-based dynamic PPPoE (**pp0**) subscriber interface associated with the ACI interface set.

  See "Configuring Dynamic VLAN Subscriber Interfaces Based on Agent Circuit Identifier Information" on page 80.

To configure the router to use the Actual-Data-Rate-Downstream or Access-Loop-Encapsulation VSA values in PPPoE control packets to adjust the CoS shaping-rate and overhead-accounting attributes for dynamic ACI interface sets and associated ACI-based dynamic VLAN subscriber interfaces, do either or both of the following:

- In a dynamic profile for an ACI interface set or a dynamic profile for an ACI-based PPPoE subscriber interface, configure adjustment of the CoS shaping-rate attribute based on the value of the Actual-Data-Rate-Downstream VSA.

  [edit dynamic-profiles *profile-name* class-of-service dynamic-class-of-service-options]
  user@host# set vendor-specific-tags actual-data-rate-downstream

- In a dynamic profile for an ACI interface set or a dynamic profile for an ACI-based PPPoE subscriber interface, configure adjustment of the CoS overhead-accounting attribute based on the value of the Access-Loop-Encapsulation VSA.

  [edit dynamic-profiles *profile-name* class-of-service dynamic-class-of-service-options]
  user@host# set vendor-specific-tags access-loop-encapsulation

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Bandwidth Management Overview on page 13
- Restrictions for Configuring Adjustment of CoS Shaping Rate and Overhead Accounting for Dynamic ACI Interface Sets on page 16
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73

CHAPTER 6

Dynamic VLANs for Subscriber Access Examples

- Example: Configuring a VLAN Dynamic Profile for VLANs with a TPID of 0x8100 on page 85
- Example: Configuring a VLAN Dynamic Profile for VLANs with Any TPID Value and Enabling Demux Interfaces over the VLAN Interface on page 86
- Example: Configuring a Stacked VLAN Dynamic Profile on page 86
- Example: Dynamic VLAN Interface Configuration on page 86
- Example: Dynamic Stacked VLAN Interface Configuration on page 87
- Example: Dynamic Flexible VLAN Interface Configuration on page 87
- Example: Configuring a Flexible VLAN Interface for Use with a Nonstandard Ethertype on page 88

Example: Configuring a VLAN Dynamic Profile for VLANs with a TPID of 0x8100

```
vlan-prof1 {
  interfaces {
    "$junos-interface-ifd-name" {
      unit "$junos-interface-unit" {
        vlan-id "$junos-vlan-id"; #Note the statement and variable use.
        family inet {
          unnumbered-address lo0.0 preferred-source-address 10.20.0.2;
        }
      }
    }
  }
}
```

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3
- Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Standard TPID Values on page 25

Example: Configuring a VLAN Dynamic Profile for VLANs with Any TPID Value and Enabling Demux Interfaces over the VLAN Interface

```
vlan-prof-any-tpid {
  interfaces {
    $junos-interface-ifd-name {
      unit $junos-interface-unit {
        demux-source inet; #Enables demux interface use over the VLAN interface.
        vlan-tags outer $junos-vlan-id; #Statement/variable combination enables the
          recognition of any VLAN interface TPID value.
        family inet {
          unnumbered-address lo0.0 preferred-source-address 10.20.0.2;
        }
      }
    }
  }
}
```

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3
- Configuring a VLAN Dynamic Profile for Creating Single-Tag VLANs Using Any TPID Values on page 26

Example: Configuring a Stacked VLAN Dynamic Profile

```
svlan-prof1 {
  interfaces {
    $junos-interface-ifd-name {
      unit $junos-interface-unit {
        vlan-tags outer $junos-stacked-vlan-id inner $junos-vlan-id;
        family inet {
          unnumbered-address lo0.0 preferred-source-address 100.20.0.2;
        }
      }
    }
  }
}
```

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3
- Configuring a Stacked VLAN Dynamic Profile on page 28

Example: Dynamic VLAN Interface Configuration

```
interfaces {
  ge-0/0/0 {
    vlan-tagging;
    auto-configure {
      vlan-ranges {
        dynamic-profile vlan-prof1 {
          accept inet;
          ranges {
```

```
                any;
              }
            }
          }
        }
      }
    }
```

Related Documentation

- Configuring VLAN Ranges for Use with Dynamic Profiles on page 44

Example: Dynamic Stacked VLAN Interface Configuration

```
interfaces {
  ge-0/0/0 {
    stacked-vlan-tagging;
    auto-configure {
      stacked-vlan-ranges {
        dynamic-profile svlan-prof {
          accept inet;
          ranges {
            1-1, any;
          }
        }
      }
    }
  }
}
```

Related Documentation

- Configuring Stacked VLAN Ranges for Use with Stacked VLAN Dynamic Profiles on page 45

Example: Dynamic Flexible VLAN Interface Configuration

```
interfaces {
  ge-0/0/0 {
    flexible-vlan-tagging;
    auto-configure {
      vlan-ranges {
        dynamic-profile vlan-prof1 {
          accept inet;
          ranges {
            any;
          }
        }
      }
      stacked-vlan-ranges {
        dynamic-profile svlan-prof1 {
          accept inet;
          ranges {
            1-1, any;
          }
        }
      }
```

```
    }
  }
}
```

Related Documentation

- Configuring Dynamic Mixed VLAN Ranges on page 46

Example: Configuring a Flexible VLAN Interface for Use with a Nonstandard Ethertype

This example specifies an ethertype of 0x9100 instead of the standard 0x8100.

```
interfaces {
  ge-0/0/0 {
    flexible-vlan-tagging;
    gigether-options {
      ethernet-switch-profile {
        tag-protocol-id 0x9100;
      }
    }
    auto-configure {
      vlan-ranges {
        dynamic-profile vlan-prof {
          accept inet;
          ranges {
            any;
          }
        }
      }
      stacked-vlan-ranges {
        dynamic-profile svlan-prof {
          accept inet;
          ranges {
            1-1,any;
          }
        }
      }
    }
  }
}
```

Related Documentation

- Dynamic 802.1Q VLAN Overview on page 3+
- *Configuring Inner and Outer TPIDs and VLAN IDs*

CHAPTER 7

Configuration Statements

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[edit dynamic-profiles] Hierarchy Level

```
dynamic-profiles {
  profile-name {
    class-of-service {
      interfaces {
        interface-name {
          unit logical-unit-number {
            classifiers {
              type (classifier-name | default);
            }
            output-traffic-control-profile (profile-name | $junos-cos-traffic-control-profile);
            rewrite-rules {
              dscp (rewrite-name | default);
              dscp-ipv6 (rewrite-name | default);
              ieee-802.1 (rewrite-name | default) vlan-tag (outer | outer-and-inner);
              inet-precedence (rewrite-name | default);
              }
            }
          }
        }
      }
      scheduler-maps {
        map-name {
          forwarding-class class-name scheduler scheduler-name;
        }
      }
      schedulers {
```

```
      (scheduler-name) {
        buffer-size (percent percentage | remainder | temporal microseconds |
          $junos-cos-scheduler-bs);
        drop-profile-map loss-priority (any | low | medium-low | medium-high | high)
          protocol (any | non-tcp | tcp) drop-profile (profile-name | predefined-variable);
        excess-priority (low | high | $junos-cos-scheduler-excess-priority);
        excess-rate (percent percentage  | percent $junos-cos-scheduler-excess-rate);
        overhead-accounting (shaping-mode) <bytes (byte-value>;
        priority (priority-level | $junos-cos-scheduler-priority);
        shaping-rate (rate | predefined-variable);
        transmit-rate (rate | percent percentage | remainder | percent percentage
          $junos-cos-scheduler-tx) <exact | rate-limit>;
      }
    }
    traffic-control-profiles profile-name {
      delay-buffer-rate (percent percentage | rate);
      excess-rate (percent percentage | proportion value | percent
        $junos-cos-excess-rate);
      guaranteed-rate (percent percentage | rate);
      overhead-accounting (shaping-mode) <bytes (byte-value>;
      scheduler-map map-name;
      shaping-rate (percent percentage | rate | predefined-variable);
    }
  }
  firewall {
    family family {
      fast-update-filter filter-name {
        interface-specific;
      match-order [match-order];
        term term-name {
          from {
            match-conditions;
          }
          then {
            action;
            action-modifiers;
          }
        only-at-create;
      filter filter-name {
      interface-specific;
        term term-name {
          from {
            match-conditions;
          }
          then {
            action;
            action-modifiers;
          }
        }
    policer policer-name {
      filter-specific;
      if-exceeding {
        (bandwidth-limit bps | bandwidth-percent percentage);
        burst-size-limit bytes;
      }
      logical-bandwidth-policer;
```

```
    logical-interface-policer;
    physical-interface-policer;
    then {
      policer-action;
    }
  }
  hierarchical-policer policer-name {
    aggregate {
      if-exceeding {
        bandwidth-limit-limit bps;
        burst-size-limit bytes;
      }
      then {
        policer-action;
      }
    }
    premium {
      if-exceeding {
        bandwidth-limit bps;
        burst-size-limit bytes;
      }
      then {
        policer-action;
      }
    }
  }
  three-color-policer policer-name {
    action {
      loss-priority high then discard;
    }
    logical-interface-policer;
    single-rate {
      (color-aware | color-blind);
      committed-burst-size bytes;
      committed-information-rate bps;
      excess-burst-size bytes;
    }
    two-rate {
      (color-aware | color-blind);
      committed-burst-size bytes;
      committed-information-rate bps;
      peak-burst-size bytes;
      peak-information-rate bps;
      }
    }
  }
}
policy-options {
  prefix-listname {
    ip-addresses;
  }
}
interfaces {
  interface-name {
    unit logical-unit-number {
      family family {
```

```
        access-concentrator name;
        address address;
        direct-connect;
        duplicate-protection;
        dynamic-profile profile-name;
        filter {
          adf {
            counter;
            input-precedence precedence;
            not-mandatory;
            output-precedence precedence;
            rule rule-value;
          }
          input filter-name {
            precedence precedence;
            shared-name filter-shared-name;
          }
          output filter-name {
            precedence precedence;
            shared-name filter-shared-name;
          }
        }
        max-sessions number;
        max-sessions-vsa-ignore;
        rpf-check {
          fail-filter filter-name;
          mode loose;
        }
        service {
          input {
            service-set service-set-name {
              service-filter filter-name;
            }
            post-service-filter filter-name;
          }
          output {
            service-set service-set-name {
              service-filter filter-name;
            }
          }
        }
        service-name-table table-name;
        short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
          maximum-seconds>;
        unnumbered-address interface-name <preferred-source-address address>;
      }
      ppp-options {
        chap;
        pap;
      }
      vlan-id number;
    }
    vlan-tagging;
  }
  interface-set interface-set-name {
    interface interface-name {
```

```
      unit logical-unit-number;
    }
  }
  demux0 {
    unit logical-unit-number {
      demux-options {
        underlying-interface interface-name
      }
      demux-source {
        source-prefix;
      }
      family family {
        access-concentrator name;
        address address;
        direct-connect;
        duplicate-protection;
        dynamic-profile profile-name;
        filter {
          input filter-name;
          output filter-name;
        }
        mac-validate (loose | strict):
        max-sessions number;
        max-sessions-vsa-ignore;
        service-name-table table-name;
        short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
          maximum-seconds>;
        unnumbered-address interface-name <preferred-source-address address>;
      }
    }
  }
  pp0 {
    unit logical-unit-number {
      keepalives interval seconds;
      no-keepalives;
      pppoe-options {
        underlying-interface interface-name;
        server;
      }
      ppp-options {
        authentication [ authentication-protocols ];
        chap {
          challenge-length minimum minimum-length maximum maximum-length;
        }
        pap;
      }
      family inet {
        unnumbered-address interface-name address;
        address address;
        service {
          input {
            service-set service-set-name {
              service-filter filter-name;
            }
            post-service-filter filter-name;
          }
```

```
            output {
              service-set service-set-name {
                service-filter filter-name;
              }
            }
          }
          filter {
            input filter-name {
              precedence precedence;
            }
            output filter-name {
              precedence precedence;
            }
          }
        }
      }
    }
  }
  protocols {
    igmp {
      interface interface-name {
        accounting;
        disable;
        group-policy;
        immediate-leave
        no-accounting;
        promiscuous-mode;
        ssm-map ssm-map-name;
        static {
          group group {
            source source;
          }
        }
        version version;
      }
      mld {
        interface interface-name {
          disable;
          (accounting | no-accounting);
          group-policy;
          immediate-leave;
          oif-map;
          passive;
          ssm-map ssm-map-name;
          static {
            group multicast-group-address {
              exclude;
              group-count number;
              group-increment increment;
              source ip-address {
                source-count number;
                source-increment increment;
              }
            }
          }
          version version;
```

```
            }
        }
        router-advertisement {
            interface interface-name {
                current-hop-limit number;
                default-lifetime seconds;
                (managed-configuration | no-managed-configuration);
                max-advertisement-interval seconds;
                min-advertisement-interval seconds;
                (other-stateful-configuration | no-other-stateful-configuration);
                prefix prefix {
                    (autonomous | no-autonomous);
                    (on-link | no-on-link);
                    preferred-lifetime seconds;
                    valid-lifetime seconds;
                }
                reachable-time milliseconds;
                retransmit-timer milliseconds;
            }
        }
    }
  }
}
routing-instances routing-instance-name {
  interface interface-name;
  routing-options {
    access {
      route prefix {
        next-hop next-hop;
        metric route-cost;
        preference route-distance;
        tag route-tag;
      }
    }
    access-internal {
      route subscriber-ip-address {
        qualified-next-hop underlying-interface {
          mac-address address;
        }
      }
    }
    multicast {
      interface interface-name {
        no-qos-adjust;
      }
    }
  }
  rib routing-table-name {
    access {
      route prefix {
        next-hop next-hop;
        metric route-cost;
        preference route-distance;
        tag route-tag;
      }
    }
```

```
        access-internal {
          route subscriber-ip-address {
            qualified-next-hop underlying-interface {
              mac-address address;
            }
          }
        }
      }
    }
    routing-options {
      access {
        route prefix {
          next-hop next-hop;
          metric route-cost;
          preference route-distance;
          tag route-tag;
        }
      }
      access-internal {
        route subscriber-ip-address {
          qualified-next-hop underlying-interface {
            mac-address address;
          }
        }
      }
      multicast {
        interface interface-name {
          no-qos-adjust;
        }
      }
    }
    variables {
      variable-name {
        default-value default-value;
        equals expression;
        mandatory;
        uid;
        uid-reference;
      }
    }
  }
```

Related Documentation

- *Dynamic Profiles Overview*
- *CoS for Subscriber Access Overview*
- *Configuring a Basic Dynamic Profile*
- *Configuring Static Hierarchical Scheduling and Queuing in a Dynamic Profile for Subscriber Access*
- *Two-Color Policer Configuration Overview*
- *Three-Color Policer Configuration Overview*
- *Hierarchical Policer Configuration Overview*
- *Guidelines for Applying Traffic Policers*

accept

Syntax accept (any | dhcp-v4 | dhcp-v6 | inet | inet6 | pppoe);

Hierarchy Level [edit interfaces *interface-name* auto-configure stacked-vlan-ranges dynamic-profile *profile-name*],
[edit interfaces *interface-name* auto-configure vlan-ranges dynamic-profile *profile-name*]

Release Information Statement introduced in Junos OS Release 9.5.
dhcp-v4 option added in Junos OS Release 10.0.
dhcp-v6, **inet6** and **pppoe** options added in Junos OS Release 10.2.
any option added in Junos OS Release 10.4.

Description Specify the type of VLAN Ethernet packet accepted by an interface that is associated with a VLAN dynamic profile or stacked VLAN dynamic profile.

Options

any—Any packet type. Specifies that any incoming packets trigger the dynamic creation of a VLAN with properties determined by the auto-configure interface configuration stanza and associated profile attributes. This option is used when configuring wholesaling in a Layer 2 network.

dhcp-v4—IPv4 DHCP packet type. Specifies that incoming IPv4 DHCP discover packets trigger the dynamic creation of a VLAN with properties determined by the auto-configure interface configuration stanza and associated profile attributes

NOTE: The DHCP-specific **mac-address** and **option-82** options are rejected if the **accept** statement is not set to **dhcp-v4**.

dhcp-v6—IPv6 DHCP packet type. Specifies that incoming IPv6 DHCP discover packets trigger the dynamic creation of a VLAN with properties determined by the auto-configure interface configuration stanza and associated profile attributes.

inet—IPv4 Ethernet and ARP packet type.

inet6—IPv6 Ethernet packet type.

pppoe—Point-to-Point Protocol over Ethernet packet type.

NOTE: The **pppoe** VLAN Ethernet packet type option is supported only for Trio MPC/MIC interfaces on MX Series routers.

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

Related Documentation

- Configuring the VLAN Ethernet Packet Type for Single-Tag VLAN Dynamic Profiles on page 40
- Configuring the VLAN Ethernet Packet Type for Stacked VLAN Dynamic Profiles on page 41
- *Configuring VLAN Interfaces for the Layer 2 Wholesale Solution*
- Configuring Subscriber Packet Types to Trigger VLAN Authentication on page 55

agent-circuit-identifier (Dynamic VLAN interface Sets)

Syntax

```
agent-circuit-identifier {
  dynamic-profile profile-name;
}
```

Hierarchy Level

[edit dynamic-profiles *profile-name* interfaces “$junos-interface-ifd-name” unit “$junos-interface-unit” auto-configure],
[edit interfaces *interface-name* unit *logical-unit-number* auto-configure]

Release Information

Statement introduced in Junos OS Release 12.2.

Description

Configure a static or dynamic underlying VLAN interface to enable dynamic VLAN subscriber interface creation based on agent circuit identifier information.

The remaining statements are explained separately.

Required Privilege Level

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

Related Documentation

- Configuring Dynamic Underlying VLAN Interfaces to Use Agent Circuit Identifier Information on page 78
- Configuring Static Underlying VLAN Interfaces to Use Agent Circuit Identifier Information on page 79

authentication

Syntax

```
authentication {
  packet-types [packet-types];
  password password-string;
  username-include {
    circuit-type;
    delimiter delimiter-character;
    domain-name domain-name-string;
    interface-name;
    mac-address;
    option-82 <circuit-id> <remote-id>;
    radius-realm radius-realm-string;
    user-prefix user-prefix-string;
  }
}
```

Hierarchy Level

[edit interfaces *interface-name* auto-configure vlan-ranges],
[edit interfaces *interface-name* auto-configure stacked-vlan-ranges]

Release Information

Statement introduced in Junos OS Release 10.0.

Description

Specify the authentication parameters that trigger the Access-Request message to AAA for the interface.

The remaining statements are explained separately.

Required Privilege Level

system—To view this statement in the configuration.
system-control—To add this statement to the configuration.

Related Documentation

- *Configuring Subscribers over Static Interfaces*
- *Configuring the Static Subscriber Global Authentication Password*

auto-configure

Syntax

```
auto-configure {
  vlan-ranges {
    access-profile profile-name;
    authentication {
      packet-types [packet-types];
      password password-string;
      username-include{
        circuit-type;
        delimiter delimiter-character;
        domain-name domain-name-string;
        interface-name;
        mac-address;
        option-18;
        option-37;
        option-82 <circuit-id> <remote-id>;
        radius-realm radius-realm-string;
        user-prefix user-prefix-string;
      }
    }
    dynamic-profile profile-name {
      accept (any | dhcp-v4 |dhcp-v6| inet | inet6 | pppoe);
      ranges (any | low-tag)–(any | high-tag);
    }
    override;
  }
  stacked-vlan-ranges {
    access-profile profile-name;
    authentication {
      packet-types [packet-types];
      password password-string;
      username-include {
        circuit-type;
        delimiter delimiter-character;
        domain-name domain-name-string;
        interface-name;
        mac-address;
        option-18;
        option-37;
        option-82 <circuit-id> <remote-id>;
        radius-realm radius-realm-string;
        user-prefix user-prefix-string;
      }
    }
    dynamic-profile profile-name {
      accept (any | dhcp-v4 |dhcp-v6| inet | inet6 | pppoe);
      ranges (any | low-tag–high-tag),(any | low-tag–high-tag);
    }
    override;
  }
  remove-when-no-subscribers;
}
```

Hierarchy Level [edit interfaces *interface-name*]

Release Information Statement introduced in Junos OS Release 9.5.

Description Enable the configuration of dynamic, auto-sensed VLANs.

The remaining statements are explained separately.

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

Related Documentation
- Configuring VLAN Interfaces to Use Dynamic Profiles on page 38

auto-configure (Dynamic VLAN Interface Sets)

Syntax

```
auto-configure {
  agent-circuit-identifier {
    dynamic-profile profile-name;
  }
}
```

Hierarchy Level [edit dynamic-profiles *profile-name* interfaces "$junos-interface-ifd-name" unit "$junos-interface-unit"],
[edit interfaces *interface-name* unit *logical-unit-number*]

Release Information Statement introduced in Junos OS Release 12.2.

Description Enable the configuration of dynamic, auto-sensed VLAN subscriber interfaces on a static or dynamic underlying VLAN interface.

The remaining statements are explained separately.

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

Related Documentation
- Configuring Dynamic Underlying VLAN Interfaces to Use Agent Circuit Identifier Information on page 78
- Configuring Static Underlying VLAN Interfaces to Use Agent Circuit Identifier Information on page 79

circuit-type

Syntax circuit-type;

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges authentication username-include], [edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication username-include],

Release Information Statement introduced in Junos OS Release 10.0.

Description Specify that the circuit type is concatenated with the username during the subscriber authentication process.

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

Related Documentation
- Configuring VLAN Interface Username Information for AAA Authentication on page 56

delimiter

Syntax delimiter *delimiter-character*;

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges authentication username-include], [edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication username-include]

Release Information Statement introduced in Junos OS Release 10.0.

Description Specify the character used as the delimiter between the concatenated components of the username. You cannot use the semicolon (;) as a delimiter.

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

Related Documentation
- Configuring VLAN Interface Username Information for AAA Authentication on page 56

demux-source (Dynamic Underlying Interface)

Syntax demux-source *family*;

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

Release Information Statement introduced in Junos OS Release 9.6.

Description Configure the logical demultiplexing (demux) source family type on the IP demux underlying interface within a dynamic profile.

NOTE: The IP demux interface feature currently supports only Fast Ethernet, Gigabit Ethernet, 10-Gigabit Ethernet, or aggregated Ethernet underlying interfaces.

Options *family*—Protocol family:

- **inet**—Internet Protocol version 4 suite
- **inet6**—Internet Protocol version 6 suite

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

domain-name

Syntax domain-name *domain-name-string*;

Hierarchy Level
[edit forwarding-options dhcp-relay authentication username-include],
[edit forwarding-options dhcp-relay group *group-name* authentication username-include],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay authentication username-include],
[edit logical-systems *logical-system-name* forwarding-options dhcp-relay group *group-name* authentication username-include],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay authentication username-include],
[edit logical-systems *logical-system-name* routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* authentication username-include],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay authentication username-include],
[edit routing-instances *routing-instance-name* forwarding-options dhcp-relay group *group-name* authentication username-include]

Release Information Statement introduced in Junos OS Release 9.1.

Description Specify the domain name that is concatenated with the username during the subscriber authentication process.

Options ***domain-name-string***—The domain name formatted string.

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

Related Documentation
- *Using External AAA Authentication Services with DHCP*

dynamic-profile (Dynamic VLAN Interface Sets)

Syntax

dynamic-profile *profile-name*;

Hierarchy Level

[edit dynamic-profiles *profile-name* interfaces “$junos-interface-ifd-name” unit “$junos-interface-unit” auto-configure agent-circuit-identifier],
[edit interfaces *interface-name* unit *logical-unit-number* auto-configure agent-circuit-identifier]

Release Information

Statement introduced in Junos OS Release 12.2.

Description

Attach a dynamic profile for an agent circuit identifier (ACI) interface set to a static or dynamic underlying VLAN interface.

Options

- *profile-name*—Name of the dynamic profile that defines the ACI interface set.

Required Privilege Level

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

Related Documentation

- Configuring Dynamic Underlying VLAN Interfaces to Use Agent Circuit Identifier Information on page 78
- Configuring Static Underlying VLAN Interfaces to Use Agent Circuit Identifier Information on page 79

dynamic-profile (Stacked VLAN)

Syntax

```
dynamic-profile profile-name {
  accept (any | dhcp-v4 |dhcp-v6| inet | inet6 | pppoe);
  ranges (any | low-tag–high-tag) ,(any | low-tag–high-tag);
}
```

Hierarchy Level

[edit interfaces *interface-name* auto-configure stacked-vlan-ranges]

Release Information

Statement introduced in Junos OS Release 9.5.

Description

Configure a dynamic profile for use when configuring dynamic stacked VLANs.

Options

profile-name—Name of the dynamic profile that you want to use when configuring dynamic stacked VLANs.

The remaining statements are explained separately.

Required Privilege Level

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

Related Documentation

- *Dynamic Profiles Overview*
- *Configuring a Basic Dynamic Profile*
- Associating a Stacked VLAN Dynamic Profile with an Interface on page 38

dynamic-profile (VLAN)

Syntax

```
dynamic-profile profile-name {
  accept (any | dhcp-v4 |dhcp-v6| inet | inet6 | pppoe);
  ranges (any | low-tag)–(any | high-tag);
}
```

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges]

Release Information Statement introduced in Junos OS Release 9.5.

Description Configure a dynamic profile for use when configuring dynamic VLANs.

Options ***profile-name***—Name of the dynamic profile that you want to use when configuring dynamic VLANs.

The remaining statements are explained separately.

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

Related Documentation

- *Dynamic Profiles Overview*
- *Configuring a Basic Dynamic Profile*
- Associating a Single-Tag VLAN Dynamic Profile with an Interface on page 38

dynamic-profiles

Syntax

```
dynamic-profiles {
  profile-name {
    class-of-service {
      interfaces {
        interface-name ;
        }
        unit logical-unit-number {
          classifiers {
            type (classifier-name | default);
          }
          output-traffic-control-profile (profile-name | $junos-cos-traffic-control-profile);
          rewrite-rules {
            dscp (rewrite-name | default);
            dscp-ipv6 (rewrite-name | default);
            ieee-802.1 (rewrite-name | default) vlan-tag (outer | outer-and-inner);
            inet-precedence (rewrite-name | default);
            }
          }
        }
      }
      scheduler-maps {
        map-name {
          forwarding-class class-name scheduler scheduler-name;
        }
      }
      schedulers {
        (scheduler-name) {
          buffer-size (seconds | percent percentage | remainder | temporal microseconds);
          drop-profile-map loss-priority (any | low | medium-low | medium-high | high)
            protocol (any | non-tcp | tcp) drop-profile profile-name;
          excess-priority (low | high | $junos-cos-scheduler-excess-priority);
          excess-rate (percent percentage | percent $junos-cos-scheduler-excess-rate);
          overhead-accounting (shaping-mode) <bytes (byte-value>;
          priority priority-level;
          shaping-rate (rate | predefined-variable);
          transmit-rate (percent percentage | rate | remainder) <exact | rate-limit>;
        }
      }
      traffic-control-profiles profile-name {
        delay-buffer-rate (percent percentage | rate | $junos-cos-delay-buffer-rate);
        excess-rate (percent percentage | proportion value | percent $junos-cos-excess-rate);
        guaranteed-rate (percent percentage | rate | $junos-cos-guaranteed-rate);
        overhead-accounting (shaping-mode) <bytes (byte-value>;
        scheduler-map map-name;
        shaping-rate (rate | predefined-variable);
      }
    }
    firewall {
      family family {
        fast-update-filter filter-name {
          interface-specific;
          match-order [match-order];
```

```
    term term-name {
      from {
        match-conditions;
      }
      then {
        action;
        action-modifiers;
      }
      only-at-create;
    }
  }
  firewall {
    family family {
      fast-update-filter filter-name {
        interface-specific;
      match-order [match-order];
        term term-name {
          from {
            match-conditions;
          }
          then {
            action;
            action-modifiers;
          }
        only-at-create;
      filter filter-name {
      interface-specific;
        term term-name {
          from {
            match-conditions;
          }
          then {
            action;
            action-modifiers;
          }
        }
    policer policer-name {
      filter-specific;
      if-exceeding {
        (bandwidth-limit bps | bandwidth-percent percentage);
        burst-size-limit bytes;
      }
      logical-bandwidth-policer;
      logical-interface-policer;
      physical-interface-policer;
      then {
        policer-action;
      }
    }
    hierarchical-policer policer-name {
      aggregate {
        if-exceeding {
          bandwidth-limit-limit bps;
          burst-size-limit bytes;
        }
        then {
```

```
                policer-action;
              }
            }
            premium {
              if-exceeding {
                bandwidth-limit bps;
                burst-size-limit bytes;
              }
              then {
                policer-action;
              }
            }
          }
          three-color-policer policer-name {
            action {
              loss-priority high then discard;
            }
            logical-interface-policer;
            single-rate {
              (color-aware | color-blind);
              committed-burst-size bytes;
              committed-information-rate bps;
              excess-burst-size bytes;
            }
            two-rate {
              (color-aware | color-blind);
              committed-burst-size bytes;
              committed-information-rate bps;
              peak-burst-size bytes;
              peak-information-rate bps;
              }
            }
          }
        }
        policy-options {
          prefix-listname {
            ip-addresses;
          }
        }
      }
    }
    interfaces interface-name {
      interface-set interface-set-name {
        interface interface-name {
          unit logical unit number {
            advisory-options {
              downstream-rate rate;
              upstream-rate rate;
            }
          }
        }
      }
      unit logical-unit-number {
        auto-configure {
          agent-circuit-identifier {
            dynamic-profile profile-name;
```

```
    }
  }
  encapsulation (atm-ccc-cell-relay | atm-ccc-vc-mux | atm-cisco-nlpid |
    atm-tcc-vc-mux | atm-mlppp-llc | atm-nlpid | atm-ppp-llc | atm-ppp-vc-mux |
    atm-snap | atm-tcc-snap | atm-vc-mux | ether-over-atm-llc |
    ether-vpls-over-atm-llc | ether-vpls-over-fr | ether-vpls-over-ppp | ethernet |
    frame-relay-ccc | frame-relay-ppp | frame-relay-tcc | frame-relay-ether-type |
    frame-relay-ether-type-tcc | multilink-frame-relay-end-to-end | multilink-ppp |
    ppp-over-ether | ppp-over-ether-over-atm-llc | vlan-bridge | vlan-ccc | vlan-vci-ccc
    | vlan-tcc | vlan-vpls);
  family family {
    address address;
    filter {
      adf {
        counter;
        input-precedence precedence;
        not-mandatory;
        output-precedence precedence;
        rule rule-value;
      }
      input filter-name (
        precedence precedence;
      }
      output filter-name {
        precedence precedence;
      }
    }
    rpf-check {
      fail-filter filter-name;
      mode loose;
    }
    service {
      input {
        service-set service-set-name {
          service-filter filter-name;
        }
        post-service-filter filter-name;
      }
      input-vlan-map {
        inner-tag-protocol-id tpid;
        inner-vlan-id number;
        (push | swap);
        tag-protocol-id tpid;
        vlan-id number;
      }
      output {
        service-set service-set-name {
          service-filter filter-name;
        }
      }
      output-vlan-map {
        inner-tag-protocol-id tpid;
        inner-vlan-id number;
        (pop | swap);
        tag-protocol-id tpid;
        vlan-id number;
```

```
            }
          }
          unnumbered-address interface-name <preferred-source-address address>;
        }
        ppp-options {
          chap;
          pap;
        }
        vlan-id number;
        vlan-tags outer [tpid].vlan-id [inner [tpid].vlan-id];
      }
    }
    interfaces {
      demux0 {...}
    }
    interfaces {
      pp0 {...}
    }
    protocols {
      igmp {
        interface interface-name {
          accounting;
          disable;
          group-policy;
          immediate-leave
          no-accounting;
          promiscuous-mode;
          ssm-map ssm-map-name;
          static {
            group group {
              source source;
            }
          }
          version version;
        }
        mld {
          interfaceinterface-name {
            disable;
            (accounting | no-accounting);
            group-policy;
            immediate-leave;
            oif-map;
            passive;
            ssm-map ssm-map-name;
            static {
              group multicast-group-address {
                exclude;
                group-count number;
                group-increment increment;
                source ip-address {
                  source-count number;
                  source-increment increment;
                }
              }
            }
            version version;
```

```
        }
      }
      router-advertisement {
        interface interface-name {
          current-hop-limit number;
          default-lifetime seconds;
          (managed-configuration | no-managed-configuration);
          max-advertisement-interval seconds;
          min-advertisement-interval seconds;
          (other-stateful-configuration | no-other-stateful-configuration);
          prefix prefix;
          reachable-time milliseconds;
          retransmit-timer milliseconds;
        }
      }
    }
  }
  routing-instances routing-instance-name {
    interface interface-name;
    routing-options {
      access {
        route prefix {
          next-hop next-hop;
          metric route-cost;
          preference route-distance;
          tag route-tag;
        }
      }
      access-internal {
        route subscriber-ip-address {
          qualified-next-hop underlying-interface {
            mac-address address;
          }
        }
      }
      multicast {
        interface interface-name {
          no-qos-adjust;
        }
      }
    }
    rib routing-table-name {
      access {
        route prefix {
          next-hop next-hop;
          metric route-cost;
          preference route-distance;
          tag route-tag;
        }
      }
      access-internal {
        route subscriber-ip-address {
          qualified-next-hop underlying-interface {
            mac-address address;
          }
        }
```

```
        }
      }
    }
    routing-options {
      access {
        route prefix {
          next-hop next-hop;
          metric route-cost;
          preference route-distance;
          tag route-tag;
        }
      }
      access-internal {
        route subscriber-ip-address {
          qualified-next-hop underlying-interface {
            mac-address address;
          }
        }
      }
      multicast {
        interface interface-name {
          no-qos-adjust;
        }
      }
    }
    variables {
      variable-name {
        default-value default-value;
        equals expression;
        mandatory;
        uid;
        uid-reference;
      }
    }
  }
}
```

Hierarchy Level [edit]

Release Information Statement introduced in Junos OS Release 9.2.
Support at the **filter, policer, hierarchical-policer, three-color-policer, and policy options** hierarchy levels introduced in Junos OS Release 11.4.

Description Create dynamic profiles for use with DHCP or PPP client access.

Options ***profile-name***—Name of the dynamic profile; string of up to 80 alphanumeric characters.

The remaining statements are explained separately.

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

Related Documentation

- *Configuring a Basic Dynamic Profile*
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- *Dynamic Profiles Overview*

family (Dynamic Standard Interface)

Syntax

```
family family {
  access-concentrator name;
  address address;
  direct-connect;
  duplicate-protection;
  dynamic-profile profile-name;
  filter {
    adf {
      counter;
      input-precedence precedence;
      not-mandatory;
      output-precedence precedence;
      rule rule-value;
    }
    input filter-name {
      precedence precedence;
    }
    output filter-name {
      precedence precedence;
    }
  }
  mac-validate (loose | strict);
  max-sessions number;
  max-sessions-vsa-ignore;
  rpf-check {
    fail-filter filter-name;
    mode loose;
  }
  service {
    input {
      service-set service-set-name {
        service-filter filter-name;
      }
      post-service-filter filter-name;
    }
    output {
      service-set service-set-name {
        service-filter filter-name;
      }
    }
  }
  service-name-table table-name
  short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
    maximum-seconds>;
  unnumbered-address interface-name <preferred-source-address address>;
}
```

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

Release Information Statement introduced in Junos OS Release 9.2.
Option **pppoe** introduced in Junos OS Release 11.2.

Description Configure protocol family information for the logical interface.

NOTE: Not all subordinate stanzas are available to every protocol family.

Options ***family***—Protocol family:

- **inet**—IP version 4 suite
- **inet6**—IP version 6 suite
- **pppoe**—(MX Series routers with MPCs only) Point-to-Point Protocol over Ethernet
- **vpls**—Virtual private LAN service

The remaining statements are explained separately.

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

Related Documentation

- *Example: Configuring Static Routing on Logical Systems*
- *Configuring the Protocol Family*

interface (Dynamic Interface Sets)

Syntax

```
interface interface-name {
  unit logical unit number {
    advisory-options {
      downstream-rate rate;
      upstream-rate rate;
    }
  }
}
```

Hierarchy Level [edit dynamic-profiles *profile-name* interfaces interface-set *interface-set-name*]

Release Information Statement introduced in Junos OS Release 12.2.

Description Add a subscriber interface to a dynamic interface set.

In a dynamic profile that defines an agent circuit identifier (ACI) interface set, observe the following guidelines when you use the **interface** statement:

- Use the predefined dynamic interface variable **$junos-interface-ifd-name** to represent the interface name. Do not use a specific interface name, such as **demux0**, when defining an ACI interface set.
- Do not include the **unit *logical-unit-number*** statement.

Options *interface-name*—Either the specific name of the interface to include in the interface set, or the predefined dynamic interface variable **$junos-interface-ifd-name**. The interface variable is dynamically replaced with the interface that the DHCP or PPPoE subscriber accesses when connecting to the router.

The remaining statement is explained separately.

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

Related Documentation

- Defining Agent Circuit Identifier Interface Sets on page 75
- *Guidelines for Configuring Dynamic CoS for Subscriber Access*
- *Configuring an Interface Set of Subscribers in a Dynamic Profile*
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11

interfaces

Syntax interfaces { ... }

Hierarchy Level [edit]

Release Information Statement introduced before Junos OS Release 7.4.

Description Configure interfaces on the router or switch.

Default The management and internal Ethernet interfaces are automatically configured. You must configure all other interfaces.

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

Related Documentation

- *Physical Interface Configuration Statements Overview*
- *Configuring Aggregated Ethernet Link Protection*

interfaces (Static and Dynamic Subscribers)

Syntax

```
interfaces {
  interface-name {
    unit logical-unit-number {
      auto-configure {
        agent-circuit-identifier {
          dynamic-profile profile-name;
        }
      }
      family family {
        access-concentrator name;
        address address;
        direct-connect;
        duplicate-protection;
        dynamic-profile profile-name;
        filter {
          adf {
            counter;
            input-precedence precedence;
            not-mandatory;
            output-precedence precedence;
            rule rule-value;
          }
          input filter-name (
            precedence precedence;
            shared-name filter-shared-name;
          }
          output filter-name {
            precedence precedence;shared-name filter-shared-name;
          }
        }
        max-sessions number;
        max-sessions-vsa-ignore;
        rpf-check {
          mode loose;
        }
        service {
          input {
            service-set service-set-name {
              service-filter filter-name;
            }
            post-service-filter filter-name;
          }
          output {
            service-set service-set-name {
              service-filter filter-name;
            }
          }
        }
        service-name-table table-name
        short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
          maximum-seconds>;
        unnumbered-address interface-name <preferred-source-address address>;
```

```
        }
        filter {
          input filter-name;
          shared-name filter-shared-name;
          output filter-name;
          shared-name filter-shared-name;
        }
        ppp-options {
          chap;
          pap;
        }
        proxy-arp;
        vlan-id;
        vlan-tags outer [tpid].vlan-id [inner [tpid].vlan-id];
      }
      vlan-tagging;
    }
    interface-set interface-set-name {
      interface interface-name {
        unit logical unit number {
          advisory-options {
            downstream-rate rate;
            upstream-rate rate;
          }
        }
      }
      pppoe-underlying-options {
        max-sessions number;
      }
    }
    demux0 {
      unit logical-unit-number {
        demux-options {
          underlying-interface interface-name
        }
        family family {
          access-concentrator name;
          address address;
          direct-connect;
          duplicate-protection;
          dynamic-profile profile-name;
          demux-source {
            source-prefix;
          }
          filter{
            input filter-name (
              precedence precedence;
              shared-name filter-shared-name;
            }
            output filter-name {
              precedence precedence;
              shared-name filter-shared-name;
            }
          }
          mac-validate (loose | strict):
          max-sessions number;
```

```
        max-sessions-vsa-ignore;
        rpf-check {
          fail-filter filter-name;
          mode loose;
        }
        service-name-table table-name
        short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
          maximum-seconds>;
        unnumbered-address interface-name <preferred-source-address address>;
      }
      filter {
        input filter-name;
        output filter-name;
      }
      vlan-id number;
      vlan-tags outer [tpid].vlan-id [inner [tpid].vlan-id];
    }
  }
  pp0 {
    unit logical-unit-number {
      keepalives interval seconds;
      no-keepalives;
      pppoe-options {
        underlying-interface interface-name;
        server;
      }
      ppp-options {
        authentication [ authentication-protocols ];
        chap {
          challenge-length minimum minimum-length maximum maximum-length;
        }
        pap;
      }
      family inet {
        unnumbered-address interface-name;
        address address;
        service {
          input {
            service-set service-set-name {
              service-filter filter-name;
            }
            post-service-filter filter-name;
          }
          output {
            service-set service-set-name {
              service-filter filter-name;
            }
          }
        }
        filter {
          input filter-name {
            precedence precedence;
            shared-name filter-shared-name;
          }
          output filter-name {
            precedence precedence;
```

```
                shared-name filter-shared-name;
            }
        }
    }
}
}
```

Hierarchy Level [edit dynamic-profiles *profile-name*]

Release Information Statement introduced in Junos OS Release 9.2.

Description Define interfaces for dynamic profiles.

Options ***interface-name***—The interface variable (**$junos-interface-ifd-name**). The interface variable is dynamically replaced with the interface the DHCP client accesses when connecting to the router.

NOTE: Though we do not recommend it, you can also enter the specific name of the interface you want to assign to the dynamic profile.

The remaining statements are explained separately.

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

Related Documentation

- *Configuring Static Subscriber Interfaces in Dynamic Profiles*
- *Configuring Dynamic Subscriber Interfaces Using IP Demux Interfaces in Dynamic Profiles*
- *Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles*
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- *Subscriber Interface Overview*
- *Relationship Between Subscribers and Interfaces in an Access Network*
- *Configuring Subscribers over Static Interfaces*
- *Demultiplexing Interface Overview*

interface-name

Syntax interface-name;

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges authentication username-include], [edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication username-include],

Release Information Statement introduced in Junos OS Release 10.0.

Description Append the interface name and VLAN ID or stacked VLAN ID to the username string used for authentication. The appended information takes the following format:

- For single VLAN—**<interface-name>:<4-digit-vlan-id>**
- For stack VLANs—**<interface-name>:<4-digit-svlan-id>-<4-digit-vlan-id>**

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

Related Documentation

- Configuring VLAN Interface Username Information for AAA Authentication on page 56

interface-set (Dynamic VLAN Interface Sets Association)

Syntax

```
interface-set interface-set-name {
  interface interface-name {
    unit logical-unit-number {
      advisory-options {
        downstream-rate rate;
        upstream-rate rate;
      }
    }
  }
}
```

Hierarchy Level [edit dynamic-profiles *profile-name* interfaces]

Release Information Statement introduced in Junos OS Release 12.2.

Description For MX Series routers with MPC/MIC modules that face the access side of the network, associate an agent circuit identifier (ACI) interface set with a dynamic VLAN subscriber interface for DHCP or PPPoE subscribers. To associate an ACI interface set with a dynamic subscriber interface, you must include the **interface-set** stanza in the dynamic profile that defines the logical subscriber interface.

An ACI interface set is a logical collection of subscriber interfaces that originate at the same household or on the same access-loop port.

Options

- *interface-set-name*—Name of the ACI interface set, which is represented in a dynamic profile for a subscriber interface by the Junos OS predefined variable **$junos-interface-set-name**.

The remaining statements are explained separately.

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

Related Documentation

- Configuring Dynamic VLAN Subscriber Interfaces Based on Agent Circuit Identifier Information on page 80
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11

interface-set (Dynamic VLAN Interface Sets Definition)

Syntax

```
interface-set interface-set-name {
  interface interface-name;
  pppoe-underlying-options {
    max-sessions number;
  }
}
```

Hierarchy Level [edit dynamic-profiles *profile-name* interfaces]

Release Information Statement introduced in Junos OS Release 12.2.

Description For MX Series routers with MPC/MIC modules that face the access side of the network, configure an agent circuit identifier (ACI) interface set for the creation of dynamic VLAN subscriber interfaces for DHCP or PPPoE subscribers based on ACI information. An ACI interface set is a logical collection of subscriber interfaces that originate at the same household or on the same access-loop port.

To configure an ACI interface set for dynamic VLAN subscriber interfaces, you must include the **interface-set** stanza in the dynamic profile that defines the ACI interface set.

Options

- *interface-set-name*—Name of the ACI interface set, which is represented in a dynamic profile by the Junos OS predefined variable **$junos-interface-set-name**.

The remaining statements are explained separately.

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

Related Documentation

- Defining Agent Circuit Identifier Interface Sets on page 75
- Clearing Agent Circuit Identifier Interface Sets on page 156
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11

mac-address (VLAN and Stacked VLAN Interfaces)

Syntax mac-address;

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges authentication username-include],
[edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication username-include],

Release Information Statement introduced in Junos OS Release 10.0.

Description Specify that the client hardware address (chaddr) from the incoming DHCP discover packet be concatenated with the username during the subscriber authentication process.

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

Related Documentation
- Configuring VLAN Interface Username Information for AAA Authentication on page 56

mac-validate (Dynamic IP Demux Interface)

Syntax mac-validate (loose | strict);

Hierarchy Level [edit dynamic-profiles *profile-name* interfaces demux0 unit *logical-unit-number* family inet]

Release Information Statement introduced in Junos OS Release 9.3.

Description Enable IP and MAC address validation for dynamic IP demux interfaces in a dynamic profile. Supported on MX Series routers only.

Options

loose—Forwards incoming packets when both the IP source address and the MAC source address match one of the trusted address tuples. Drops packets when the IP source address matches one of the trusted tuples, but the MAC address does not match the MAC address of the tuple. Continues to forward incoming packets when the source address of the incoming packet does not match any of the trusted IP addresses.

strict—Forwards incoming packets when both the IP source address and the MAC source address match one of the trusted address tuples. Drops packets when the MAC address does not match the tuple's MAC source address, or when IP source address of the incoming packet does not match any of the trusted IP addresses.

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

Related Documentation
- *Configuring MAC Address Validation for Subscriber Interfaces*

max-sessions (Dynamic PPPoE)

Syntax max-sessions *number*;

Hierarchy Level
[edit dynamic-profiles *profile-name* interfaces demux0 unit *logical-unit-number* family pppoe],
[edit dynamic-profiles *profile-name* interfaces *interface-name* unit *logical-unit-number* family pppoe],
[edit dynamic-profiles *profile-name* interfaces interface-set *interface-set-name* pppoe-underlying-options]
[edit interfaces *interface-name* unit *logical-unit-number* family pppoe],
[edit interfaces *interface-name* unit *logical-unit-number* pppoe-underlying-options],
[edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number* family pppoe],
[edit logical-systems *logical-system-name* interfaces *interface-name* unit *logical-unit-number* pppoe-underlying-options]

Release Information Statement introduced in Junos OS Release 10.1.
Support for the **[edit ... family pppoe]** hierarchies introduced in Junos OS Release 11.2.
Support at the **[edit dynamic-profiles ... interfaces interface-set ... pppoe-underlying-options]** hierarchy level introduced in Junos OS Release 12.2.

Description Configure the maximum number of dynamic PPPoE logical interfaces that the router can activate on the underlying interface. The **max-sessions** value does not affect the maximum number of static PPPoE logical interfaces that can be configured on the underlying interface.

NOTE: The **[edit ... family pppoe]** hierarchies and the **[edit dynamic-profiles ... interfaces interface-set ... pppoe-underlying-options]** hierarchy level are supported only on MX Series routers with MPCs/MICs.

Options *number*—Maximum number of dynamic PPPoE logical interfaces (sessions) that the router can activate on the underlying interface. The default value is equal to the maximum number of PPPoE sessions supported on your routing platform. You can configure from 1 to the platform-specific default for your routing platform. Changing the **max-sessions** value has no effect on dynamic PPPoE logical interfaces that are already active.

For information about scaling values for PPPoE interfaces, access the *Subscriber Management Scaling Values (XLS)* spreadsheet from the Downloads box on the *Junos OS Subscriber Management* pathway page for the current release.

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

Related Documentation
- *Limiting the Maximum Number of PPPoE Sessions on the Underlying Interface*
- Defining Agent Circuit Identifier Interface Sets on page 75

- *PPPoE Maximum Session Limit Overview*
- *Guidelines for Using PPPoE Maximum Session Limit from RADIUS*
- *Juniper Networks VSAs Supported by the AAA Service Framework*
- *Configuring an Interface Set of Subscribers in a Dynamic Profile*
- *Subscriber Interfaces and PPPoE Overview*

oam-on-svlan (Ethernet Interfaces)

Syntax oam-on-svlan;

Hierarchy Level [edit interfaces *interface-name*]

Release Information Statement introduced in Junos OS Release 13.1.

Description On MX Series routers with MPC/MIC interfaces, enable propagation of the Ethernet IEEE 802.1ag Operation, Administration, and Maintenance (OAM) state of a static single-tagged service VLAN (S-VLAN) logical interface to the dynamic or static double-tagged customer VLAN (C-VLAN) logical interface and associated subscriber interfaces configured on the S-VLAN. The static S-VLAN logical interface must be configured with Ethernet OAM connectivity fault management (CFM) on a Gigabit Ethernet, 10-Gigabit Ethernet, or aggregated Ethernet physical interface. The C-VLAN logical interface must have the same S-VLAN (outer) tag as the S-VLAN logical interface.

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

Related Documentation

- Configuring Ethernet OAM Support for Service VLANs with Double-Tagged Customer VLANs on page 59
- Ethernet OAM Support for Service VLANs Overview on page 4

option-18 (Interface-ID for DHCPv6 Autosense VLANs)

Syntax option-18;

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges authentication username-include], [edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication username-include]

Release Information Statement introduced in Junos OS Release 13.2.

Description Specify that Option 18 (Interface-ID) information received in the innermost DHCPv6 Relay-Forward message header is concatenated with the username during the subscriber authentication process.

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

Related Documentation

- Configuring VLAN Interface Username Information for AAA Authentication on page 56
- *Inserting DHCPv6 Interface-ID Option (Option 18) In DHCPv6 Packets*
- *Creating Unique Usernames for DHCP Clients*
- Option 18 and Option 37 in Authentication Usernames for DHCPv6 Autosense VLANs on page 57
- **option-37 (Relay Agent Remote-ID for DHCPv6 Autosense VLANs) on page 131**

option-37 (Relay Agent Remote-ID for DHCPv6 Autosense VLANs)

Syntax option-37;

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges authentication username-include], [edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication username-include]

Release Information Statement introduced in Junos OS Release 13.2.

Description Specify that Option 37 (DHCPv6 Relay Agent Remote-ID) information, received in the innermost DHCPv6 Relay-Forward message header, is concatenated with the username during the subscriber authentication process.

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

Related Documentation

- Configuring VLAN Interface Username Information for AAA Authentication on page 56
- *relay-agent-remote-id*
- *Creating Unique Usernames for DHCP Clients*
- *Inserting DHCPv6 Interface-ID Option (Option 18) In DHCPv6 Packets*
- Option 18 and Option 37 in Authentication Usernames for DHCPv6 Autosense VLANs on page 57
- **option-18 (Interface-ID for DHCPv6 Autosense VLANs) on page 130**

option-82

Syntax option-82 <circuit-id> <remote-id>;

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges authentication username-include], [edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication username-include]

Release Information Statement introduced in Junos OS Release 10.0.
Options **circuit-id** and **remote-id** introduced in Junos OS Release 11.4.

Description Specify that the option 82 information from the client PDU is concatenated with the username during the subscriber authentication process.

For autosense VLANs, you can additionally specify Option 82 suboption information that is concatenated with the username. You can specify either both or neither of the Agent Circuit ID (suboption 1) and Agent Remote ID (suboption 1). If you specify both, the Agent Circuit ID is supplied first, followed by a delimiter, and then the Agent Remote ID. If you specify that neither suboption is supplied, the raw payload of Option 82 from the PDU is concatenated to the username.

NOTE: The option 82 value used in creating the username is based on the option 82 value that is encoded in the incoming DHCP discover packet. The use of suboptions is supported for DHCPv4 only.

Options **none**—Use the raw payload of Option 82 from the PDU.

circuit-id—(Optional) Use the Agent Circuit ID suboption (suboption 1).

remote-id—(Optional) Use the Agent Remote ID suboption (suboption 2).

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

Related Documentation

- Configuring VLAN Interface Username Information for AAA Authentication on page 56
- Option 82 Suboptions in Authentication Usernames for Autosense VLANs on page 57

override

Syntax override tag *vlan-tag* dynamic-profile *profile name*;

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges],
[edit interfaces *interface-name* auto-configure stacked-vlan-ranges]

Release Information Statement introduced in Junos OS Release 11.2.

Description Override dynamic profile assignment to individual VLANs that are already part of a previously defined VLAN range and dynamic profile.

Options ***vlan-tag***—VLAN tag that you want to override.

profile-name—Name of the dynamic profile that you want to use when overriding the specified VLAN tag.

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

Related Documentation

- Configuring VLAN Dynamic Profile Override on page 47
- Configuring VLAN Ranges for Use with Dynamic Profiles on page 44

packet-types (Dynamic VLAN Authentication)

Syntax packet-types [*packet-types*]

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges authentication],
[edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication]

Release Information Statement introduced in Junos OS Release 14.1.

Description Specify one or more packet types to trigger authentication of an auto-configured dynamic VLAN. The packet types must be a subset of the packet types configured in the VLAN dynamic profile to trigger creation of the dynamic VLAN.

Options ***packet-type***—One or more of the following packet types that triggers VLAN authentication:

- **any**—Any packet type.
- **dhcp-v4**—IPv4 DHCP packet type.
- **dhcp-v6**—IPv6 DHCP packet type.
- **inet**—IPv4 Ethernet and ARP packet type.
- **inet6**—IPv6 Ethernet packet type.
- **pppoe**—Point-to-Point Protocol over Ethernet packet type.

NOTE: The pppoe VLAN Ethernet packet type option is supported only for MIC and MPC interfaces on MX Series routers.

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

Related Documentation

- Configuring Subscriber Packet Types to Trigger VLAN Authentication on page 55
- *Subscriber Packet Type Authentication Triggers for Dynamic VLANs*

pppoe-underlying-options (Dynamic VLAN Interface Sets)

Syntax

```
pppoe-underlying-options {
  max-sessions number;
}
```

Hierarchy Level [edit dynamic-profiles *profile-name* interfaces interface-set "$junos-interface-set-name"]

Release Information Statement introduced in Junos OS Release 12.2.

Description Configure PPPoE-specific interface properties in the dynamic profile that defines the agent circuit identifier (ACI) interface set. An ACI interface set is a logical collection of subscriber interfaces that originate at the same household or on the same access-loop port. Configuring PPPoE-specific interface properties for an ACI interface set enables you to apply these attributes to all subscribers on a per-household basis.

The remaining statement is explained separately.

NOTE: When you configure PPPoE-specific interface properties for an ACI interface set, only the max-sessions statement is currently supported.

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

Related Documentation

- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11

proxy-arp

Syntax

```
proxy-arp;
```

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

Release Information Statement introduced in Junos OS Release 9.5.

Description For Ethernet interfaces only, configure the router to respond to any ARP request, as long as the router has an active route to the target address of the ARP request.

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

Related Documentation

- *Configuring Restricted and Unrestricted Proxy ARP*
- *Configuring Gratuitous ARP*

radius-realm

Syntax radius-realm *radius-realm-string*;

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges authentication username-include], [edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication username-include]

Release Information Statement introduced in Junos OS Release 10.0.

Description Specify that the user-defined RADIUS realm string is appended as a last piece to the username and used by RADIUS to direct the authentication request to a profile that does not allocates addresses.

Options ***radius-realm-string***—A string to describe the RADIUS realm.

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

Related Documentation
- Configuring VLAN Interface Username Information for AAA Authentication on page 56

ranges (Dynamic VLAN)

Syntax ranges (any | *low-tag*)-(any | *high-tag*);

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges dynamic-profile *profile-name*]

Release Information Statement introduced in Junos OS Release 9.5.

Description Configure VLAN ranges for dynamic, auto-sensed VLANs.

Options **any**—The entire VLAN range.

low-tag—The lower limit of the VLAN range.

high-tag—The upper limit of the VLAN range.
Range: 1 through 4094

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

Related Documentation
- Configuring Single-Level VLAN Ranges for Use with VLAN Dynamic Profiles on page 44

ranges (Dynamic Stacked VLAN)

Syntax ranges (any | *low-tag–high-tag*),(any | *low-tag–high-tag*);

Hierarchy Level [edit interfaces *interface-name* auto-configure stacked-vlan-ranges dynamic-profile *profile-name*]

Release Information Statement introduced in Junos OS Release 9.5.

Description Configure VLAN ranges for dynamic, auto-sensed stacked VLANs.

Options **any**—The entire VLAN range.

low-tag—The lower limit of the VLAN range.

high-tag—The upper limit of the VLAN range.
Range: 1 through 4094

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

Related Documentation
- Configuring Stacked VLAN Ranges for Use with Stacked VLAN Dynamic Profiles on page 45

stacked-vlan-ranges

Syntax

```
stacked-vlan-ranges {
  access-profile profile-name;
  authentication {
    packet-types [packet-types];
    password password-string;
    username-include {
      circuit-type;
      delimiter delimiter-character;
      domain-name domain-name-string;
      interface-name;
      mac-address;
      option-18
      option-37
      option-82;
      radius-realm radius-realm-string;
      user-prefix user-prefix-string;
    }
  }
  dynamic-profile profile-name {
    accept (any | dhcp-v4 | inet);
    ranges (any | low-tag–high-tag),(any | low-tag–high-tag);
  }
  override;
}
```

Hierarchy Level [edit interfaces *interface-name* auto-configure]

Release Information Statement introduced in Junos OS Release 9.5.

Description Configure multiple VLANs. Each VLAN is assigned a VLAN ID number from the range.

The remaining statements are explained separately.

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

Related Documentation

- Configuring Stacked VLAN Ranges for Use with Stacked VLAN Dynamic Profiles on page 45
- Configuring Dynamic Mixed VLAN Ranges on page 46

stacked-vlan-tagging

Syntax stacked-vlan-tagging;

Hierarchy Level [edit interfaces *interface-name*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.

Description For Gigabit Ethernet IQ interfaces, Gigabit Ethernet, 10-Gigabit Ethernet LAN/WAN PIC, and 100-Gigabit Ethernet Type 5 PIC with CFP, enable stacked VLAN tagging for all logical interfaces on the physical interface.

For pseudowire subscriber interfaces, enable stacked VLAN tagging for logical interfaces on the pseudowire service.

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

Related Documentation

- *Stacking and Rewriting Gigabit Ethernet VLAN Tags Overview*
- *vlan-tags (Stacked VLAN Tags)*

unit (Dynamic Profiles Standard Interface)

Syntax

```
unit logical-unit-number {
  auto-configure {
    agent-circuit-identifier {
      dynamic-profile profile-name;
    }
  }
  dial-options {
    ipsec-interface-id name;
    l2tp-interface-id name;
    (shared | dedicated);
  }
  encapsulation (atm-ccc-cell-relay | atm-ccc-vc-mux | atm-cisco-nlpid | atm-tcc-vc-mux
    | atm-mlppp-llc | atm-nlpid | atm-ppp-llc | atm-ppp-vc-mux | atm-snap | atm-tcc-snap
    | atm-vc-mux | ether-over-atm-llc | ether-vpls-over-atm-llc | ether-vpls-over-fr |
    ether-vpls-over-ppp | ethernet | frame-relay-ccc | frame-relay-ppp | frame-relay-tcc |
    frame-relay-ether-type | frame-relay-ether-type-tcc | multilink-frame-relay-end-to-end
    | multilink-ppp | ppp-over-ether | ppp-over-ether-over-atm-llc | vlan-bridge | vlan-ccc |
    vlan-vci-ccc | vlan-tcc | vlan-vpls);
  family family {
    access-concentrator name;
    address address;
    direct-connect;
    duplicate-protection;
    dynamic-profile profile-name;
    filter {
      adf {
        counter;
        input-precedence precedence;
        not-mandatory;
        output-precedence precedence;
        rule rule-value;
      }
      input filter-name (
        precedence precedence;
      }
      output filter-name {
        precedence precedence;
      }
    }
    max-sessions number;
    max-sessions-vsa-ignore;
    rpf-check {
      fail-filter filter-name;
      mode loose;
    }
    service {
      input {
        service-set service-set-name {
          service-filter filter-name;
        }
        post-service-filter filter-name;
      }
```

```
        input-vlan-map {
          inner-tag-protocol-id tpid;
          inner-vlan-id number;
          (push | swap);
          tag-protocol-id tpid;
          vlan-id number;
        }
        output {
          service-set service-set-name {
            service-filter filter-name;
          }
        }
        output-vlan-map {
          inner-tag-protocol-id tpid;
          inner-vlan-id number;
          (pop | swap);
          tag-protocol-id tpid;
          vlan-id number;
        }
      }
      service-name-table table-name
      short-cycle-protection <lockout-time-min minimum-seconds lockout-time-max
        maximum-seconds>;
      unnumbered-address interface-name <preferred-source-address address>;
      filter {
        input filter-name;
        output filter-name;
      }
      keepalives {
        interval seconds;
        }
      ppp-options {
        chap;
        pap;
      }
      vlan-id number;
      vlan-tags outer [tpid].vlan-id [inner [tpid].vlan-id];
    }
  }
```

Hierarchy Level [edit dynamic-profiles *profile-name* interfaces *interface-name*]

Release Information Statement introduced in Junos OS Release 9.2.

Description Configure a logical interface on the physical device. You must configure a logical interface to be able to use the physical device.

Options

logical-unit-number—The specific unit number of the interface you want to assign to the dynamic profile, or one of the following Junos OS predefined variables:

- **$junos-underlying-interface-unit**—For static VLANs, the unit number variable. The static unit number variable is dynamically replaced with the client unit number when the client session begins. The client unit number is specified by the DHCP when it accesses the subscriber network.
- **$junos-interface-unit**—The unit number variable on a dynamic underlying VLAN interface for which you want to enable the creation of dynamic VLAN subscriber interfaces based on agent circuit identifier information.

The remaining statements are explained separately.

Required Privilege Level

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

Related Documentation

- Configuring Dynamic Underlying VLAN Interfaces to Use Agent Circuit Identifier Information on page 78
- Configuring Static Underlying VLAN Interfaces to Use Agent Circuit Identifier Information on page 79
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11

unit (Dynamic Interface Sets)

Syntax

```
unit logical-unit-number {
  advisory-options {
    downstream-rate rate;
    upstream-rate rate;
  }
}
```

Hierarchy Level [edit dynamic-profiles *profile-name* interfaces interface-set *interface-set-name* interface *interface-name*]

Release Information Statement introduced in Junos OS Release 10.4.

Description Apply the logical interface unit to the interface set.

Options ***logical-unit-number***—One of the following options:

- **$junos-underlying-interface-unit**—For static VLANs, the unit number variable. The static unit number variable is dynamically replaced with the client unit number when the client session begins. The client unit number is specified by the DHCP when it accesses the subscriber network.
- **$junos-interface-unit**—For dynamic demux and dynamic PPPoE interfaces, the unit number variable. The static unit number variable is dynamically replaced with the client unit number when the client session begins. The client unit number is specified by the DHCP or PPP when it accesses the subscriber network.
- *value*—Specific unit number of the interface you want to assign to the dynamic-profile

Range: 0 through 1,073,741,823.

The remaining statements are explained separately.

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

Related Documentation

- Configuring Dynamic VLAN Subscriber Interfaces Based on Agent Circuit Identifier Information on page 80
- *Applying Traffic Shaping and Scheduling to a Subscriber Interface in a Dynamic Profile*
- *Configuring an Interface Set of Subscribers in a Dynamic Profile*
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11
- *Guidelines for Configuring Dynamic CoS for Subscriber Access*

unnumbered-address (Dynamic Profiles)

Syntax unnumbered-address *interface-name* <preferred-source-address *address*>;

Hierarchy Level [edit dynamic-profiles *profile-name* interfaces *interface-name* unit *logical-unit-number* family *family*],
[edit dynamic-profiles *profile-name* interfaces demux0 unit *logical-unit-number* family *family*]

Release Information Statement introduced in Junos OS Release 9.2.
$junos-preferred-source-address variable support added in Junos OS Release 9.6.
Support for the **$junos-loopback-interface** predefined variable introduced in Junos OS Release 9.6.

Description For Ethernet interfaces, enable the local address to be derived from the specified interface. Configuring unnumbered Ethernet interfaces enables IP processing on the interface without assigning an explicit IP address to the interface. To configure unnumbered address dynamically, include the **$junos-loopback-interface-address** predefined variable.

You can configure unnumbered address support on Ethernet interfaces for IPv4 and IPv6 address families.

Options *interface-name*—Name of the interface from which the local address is derived. The specified interface must have a logical unit number, a configured IP address, and must not be an unnumbered interface. This value can be a specific interface name or the **$junos-loopback-interface** dynamic variable.

When defining the **unnumbered-address** statement using a static interface, keep the following in mind:

- If you choose to include the **routing-instance** statement at the **[edit dynamic-profiles]** hierarchy level, that statement must be configured with a valid, static routing instance value. In addition, whatever static unnumbered interface you specify must belong to that routing instance.
- If you choose to not include the **routing-instance** statement at the **[edit dynamic-profiles]** hierarchy level, the unnumbered-address statement uses the default routing instance. The use of the default routing instance requires that the unnumbered interface be configured statically and that it reside in the default routing instance.

When defining the **unnumbered-address** statement using the **$junos-loopback-interface** dynamic variable, keep the following in mind:

- To use the **$junos-loopback-interface** dynamic variable, the dynamic profile must also contain the **routing-instance** statement configured with the **$junos-routing-instance** dynamic variable at the [edit dynamic-profiles] hierarchy level.
- The applied loopback interface is based on the dynamically obtained routing instance of the subscriber.

address—(Optional) Secondary IP address of the donor interface. Configuring the preferred source address enables you to use an IP address other than the primary IP address on some of the unnumbered Ethernet interfaces in your network. This value can be a static IP address, the **$junos-preferred-source-address** dynamic variable for the inet family, or **$junos-preferred-source-ipv6-address** dynamic variable for the inet6 family.

When defining the **preferred-source-address** value using a static IP address, keep the following in mind:

- The unnumbered interface must be statically configured.
- The IP address specified as the **preferred-source-address** must be configured in the specified unnumbered interface.

When defining the **preferred-source-address** value using the **$junos-preferred-source-address** or **$junos-preferred-source-ipv6-address** dynamic variables, keep the following in mind:

- You must configure the **unnumbered-address** statement using the **$junos-loopback-interface** dynamic variable.
- You must configure the **routing-instance** statement using the **$junos-routing-instance** dynamic variable at the **[edit dynamic-profiles]** hierarchy level.
- The preferred source address chosen is based on the dynamically applied loopback address which is in turn derived from the dynamically obtained routing instance of the subscriber. The configured loopback address with the closest network match to the user IP address is selected as the preferred source address.

Required Privilege Level

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

Related Documentation

- *Configuring an Unnumbered Interface*
- *Dynamic Profiles Overview*

username-include

Syntax

```
username-include {
  circuit-type;
  delimiter delimiter-character;
  domain-name domain-name-string;
  interface-name;
  mac-address;
  option-18;
  option-37;
  option-82 <circuit-id> <remote-id>;
  radius-realm radius-realm-string;
  user-prefix user-prefix-string;
}
```

Hierarchy Level

[edit interfaces *interface-name* auto-configure vlan-ranges authentication],
[edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication]

Release Information

Statement introduced in Junos OS Release 10.0.

Description

Configure the username that the router passes to the external AAA server. You must include at least one of the optional statements for the username to be valid. If you do not configure a username, the router accesses the local authentication service only and does not use external authentication services, such as RADIUS.

The username takes the format ***user-prefix mac-address circuit-type option–82 interface-name domain-name radius-realm*** with each component separated by whatever delimiter you choose.

The remaining statements are explained separately.

Required Privilege Level

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

Related Documentation

- Configuring VLAN Interface Username Information for AAA Authentication on page 56
- Option 82 Suboptions in Authentication Usernames for Autosense VLANs on page 57
- Option 18 and Option 37 in Authentication Usernames for DHCPv6 Autosense VLANs on page 57

user-prefix

Syntax user-prefix *user-prefix-string*;

Hierarchy Level [edit interfaces *interface-name* auto-configure vlan-ranges authentication username-include], [edit interfaces *interface-name* auto-configure stacked-vlan-ranges authentication username-include]

Release Information Statement introduced in Junos OS Release 10.0.

Description Specify the user prefix that is concatenated with the username during the subscriber authentication process.

Options ***user-prefix-string***—The user prefix string.

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

Related Documentation

- Configuring VLAN Interface Username Information for AAA Authentication on page 56

vlan-id (Dynamic Profiles)

Syntax vlan-id (*number* | none);

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

Release Information Statement introduced in Junos OS Release 9.5.
VLAN demux interface support introduced in Junos OS Release 10.2.

Description For VLAN demux, Fast Ethernet, Gigabit Ethernet, and Aggregated Ethernet interfaces only, bind a 802.1Q VLAN tag ID to a logical interface.

Options *number*—A valid VLAN identifier. When used in the **dynamic-profiles** hierarchy, specify the **$junos-vlan-id** predefined variable to dynamically obtain the VLAN identifier.

none—Enable the use of untagged pseudo-wire frames on dynamic interfaces.

- For aggregated Ethernet, 4-port, 8-port, and 12-port Fast Ethernet PICs, and for management and internal Ethernet interfaces, 1 through 1023.
- For 48-port Fast Ethernet and Gigabit Ethernet PICs, 1 through 4094.
- VLAN ID 0 is reserved for tagging the priority of frames.

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

Related Documentation

- *Configuring Static Subscriber Interfaces Using VLAN Demux Interfaces*
- *Configuring Dynamic Subscriber Interfaces Using VLAN Demux Interfaces in Dynamic Profiles*

vlan-ranges

Syntax

```
vlan-ranges {
  access-profile profile-name;
  authentication {
    packet-types [packet-types];
    password password-string;
    username-include {
      circuit-type;
      delimiter delimiter-character;
      domain-name domain-name-string;
      interface-name;
      mac-address;
      option-82 <circuit-id> <remote-id>;
      radius-realm radius-realm-string;
      user-prefix user-prefix-string;
    }
  }
  dynamic-profile profile-name {
    accept (any | dhcp-v4 | inet);
    ranges (any | low-tag)–(any | high-tag);
  }
  override;
}
```

Hierarchy Level [edit interfaces *interface-name* auto-configure]

Release Information Statement introduced in Junos OS Release 9.5.

Description Configure multiple VLANs. Each VLAN is assigned a VLAN ID number from the range.

The remaining statements are explained separately.

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

Related Documentation

- Configuring Single-Level VLAN Ranges for Use with VLAN Dynamic Profiles on page 44
- Configuring Dynamic Mixed VLAN Ranges on page 46

vlan-tagging

Syntax vlan-tagging;

Hierarchy Level [edit interfaces *interface-name*],
[edit logical-systems *logical-system-name* interfaces *interface-name*]

Release Information Statement introduced before Junos OS Release 7.4.
Statement introduced in Junos OS Release 9.0 for EX Series switches.
Statement introduced in Junos OS Release 12.2 for ACX Series Universal Access Routers.
Statement introduced in Junos OS Release 13.2 for PTX Series Routers.

Description For Fast Ethernet and Gigabit Ethernet interfaces, aggregated Ethernet interfaces configured for VPLS, and pseudowire subscriber interfaces, enable the reception and transmission of 802.1Q VLAN-tagged frames on the interface.

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

Related Documentation

- *Example: Configuring Layer 3 Subinterfaces for a Distribution Switch and an Access Switch*
- *Example: Configuring BGP Autodiscovery for LDP VPLS*
- *Configuring a Layer 3 Subinterface (CLI Procedure)*
- *Configuring Tagged Aggregated Ethernet Interfaces*
- *Configuring Interfaces for VPLS Routing*
- *Enabling VLAN Tagging*
- *802.1Q VLANs Overview*
- *vlan-id*

vlan-tags

Syntax vlan-tags outer [*tpid*].*vlan-id* [inner [*tpid*].*vlan-id*];

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

Release Information Statement introduced in Junos OS Release 9.5.
VLAN demux interface support introduced in Junos OS Release 10.2.

Description For Gigabit Ethernet IQ and IQE interfaces only, binds TPIDs and 802.1Q VLAN tag IDs to a logical interface. You must include the **stacked-vlan-tagging** statement at the **[edit interfaces *interface-name*]** hierarchy level.

NOTE: The inner-range *vid1–vid2* option is supported on MX Series routers with IQE PICs only.

Options

inner [*tpid*].*vlan-id*—A TPID (optional) and a valid VLAN identifier in the format *tpid*.*vlan-id*. When used in the **dynamic-profiles** hierarchy, specify the **$junos-vlan-id** predefined variable to dynamically obtain the VLAN ID.

Range: For VLAN ID, 1 through 4094. VLAN ID 0 is reserved for tagging the priority of frames.

outer [*tpid*].*vlan-id*—A TPID (optional) and a valid VLAN identifier in the format *tpid*.*vlan-id*. When used in the **dynamic-profiles** hierarchy, specify the **$junos-stacked-vlan-id** predefined variable.

Range: For VLAN ID, 1 through 511 for normal interfaces, and 512 through 4094 for VLAN CCC interfaces. VLAN ID 0 is reserved for tagging the priority of frames.

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

Related Documentation

- *Configuring Dual VLAN Tags*
- stacked-vlan-tagging on page 139

PART 3

Administration

- Monitoring Dynamic VLANs for Subscriber Access on page 155
- Monitoring Commands on page 159

CHAPTER 8

Monitoring Dynamic VLANs for Subscriber Access

- Verifying and Managing Dynamic VLAN Configuration on page 155
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155
- Clearing Agent Circuit Identifier Interface Sets on page 156

Verifying and Managing Dynamic VLAN Configuration

Purpose View or clear information about dynamic VLANs and stacked VLANs.

Action

- To display subscriber dynamic VLAN information:

  user@host>show subscribers **detail**

- To display interface-specific output for dynamic VLANs:

  user@host>show interfaces ***interface-name***

- To clear the binding state of dynamic VLAN interfaces:

  user@host> clear auto-configuration interfaces

Related Documentation

- CLI Explorer

Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration

Purpose View information about dynamic agent circuit identifier (ACI) interface sets and ACI-based dynamic VLAN subscriber interfaces configured on the router.

Action

- To display the logical and physical interface associations for the classifier, rewrite rules, scheduler map objects, and CoS adjustment settings:

  `user@host>` show class-of-service interface ***interface-name***

- To display the CoS associations for the specified dynamic ACI interface set:

  `user@host>` show class-of-service interface-set ***aci-interface-set-name***

- To display information about the specified CoS traffic shaping and scheduling profile:

  `user@host>` show class-of-service traffic-control-profile ***profile-name***

- To display address bindings and ACI interface set information in the client table on the extended DHCP local server:

  ```
  user@host> show dhcp server binding detail
  ```

- To display status information about a specified Gigabit Ethernet interface:

  ```
  user@host> show interfaces ge-fpc/pic/port.logical-unit-number
  ```

- To display status information about a specified IP demultiplexing (IP demux) interface:

  ```
  user@host> show interfaces demux0.logical-interface-number
  ```

- To display information about all dynamic ACI interface sets configured on the router:

  ```
  user@host> show interfaces interface-set
  ```

- To display session-specific information about ACI-based dynamic PPPoE subscriber interfaces:

  ```
  user@host> show pppoe interfaces pp0.logical-unit-number
  ```

- To display information about PPPoE underlying interfaces, including whether creation of ACI-based dynamic VLAN subscriber interfaces is enabled on the underlying interface:

  ```
  user@host> show pppoe underlying-interfaces logical-interface-name detail
  ```

- To display information about active subscriber sessions associated with ACI interface sets:

  ```
  user@host> show subscribers detail
  ```

- To display information about active subscriber sessions associated with a specified ACI interface set:

  ```
  user@host> show subscribers aci-interface-set-name aci-interface-set-name detail
  ```

- To display information about active subscriber sessions that have an agent circuit identifier value containing a matching substring:

  ```
  user@host> show subscribers agent-circuit-identifier agent-circuit-identifier-substring detail
  ```

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Overview on page 9
- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- Clearing Agent Circuit Identifier Interface Sets on page 156
- CLI Explorer

Clearing Agent Circuit Identifier Interface Sets

Purpose Clear a specified dynamic agent circuit identifier (ACI) interface set configured on the router.

Action

- To clear a specified ACI interface set that that has no active members:

  ```
  user@host> clear auto-configuration interfaces interface-set interface-set-name
  ```

  For example, the following command clears the ACI interface set named aci-1003-ge-1/0/0.4001:

  ```
  user@host> clear auto-configuration interfaces interface-set aci-1003-ge-1/0/0.4001
  ```

```
Interface-set aci-1003-ge-1/0/0.4001 deleted
```

Meaning The router dynamically creates an ACI interface set, if configured, when the first DHCP or PPPoE subscriber from a particular household logs in. However, the router does not automatically delete the ACI interface set when the last subscriber from that household logs out. As a result, you must use the **clear auto-configuration interfaces interface-set** command to explicitly clear the ACI interface set when it no longer has any active subscriber interface members. If you attempt to clear an ACI interface that still has active member interfaces, the router displays an error message and rejects the command.

When you specify the name of the ACI interface set to be cleared, you must use the ACI interface set name internally generated by the router, and not the actual ACI string carried in DHCP and PPPoE control packets. The router uses the following format to name ACI interface sets, as shown in the ACI interface set named aci-1003-ge-1/0/0.4001:

aci-*nnnn-interface-name.logical-unit-number*

where:

- *nnnn* is a randomly generated 4-digit identifier (1003 in the example)
- *interface-name* is the name of the dynamic subscriber interface (ge-1/0/0 in the example)
- *logical-unit-number* is the logical unit number of the dynamic subscriber interface (4001 in the example)

To view the names of the ACI interface sets configured on the router, use the **show subscribers** command.

Related Documentation

- Agent Circuit Identifier-Based Dynamic VLANs Components Overview on page 11
- Configuring Dynamic VLANs Based on Agent Circuit Identifier Information on page 73
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155
- CLI Explorer

CHAPTER 9

Monitoring Commands

- clear auto-configuration interfaces
- clear auto-configuration interfaces interface-set
- show class-of-service interface
- show class-of-service interface-set
- show class-of-service traffic-control-profile
- show dhcp server binding
- show interfaces (Gigabit Ethernet)
- show interfaces demux0 (Demux Interfaces)
- show interfaces interface-set (Ethernet Interface Set)
- show pppoe interfaces
- show pppoe underlying-interfaces
- show subscribers
- show subscribers summary

clear auto-configuration interfaces

Syntax clear auto-configuration interfaces *interface-name*

Release Information Command introduced in Junos OS Release 9.5.

Description Clear dynamically created VLAN interfaces.

NOTE: For the clear command to be successful, no interface bindings (for example, DHCP server bindings) can exist on the dynamic interface.

Options *interface-name*—Name of a physical or logical interface.

Required Privilege Level view

Related Documentation

- *Dynamic VLANs Feature Guide*
- Verifying and Managing Dynamic VLAN Configuration on page 155

List of Sample Output

clear auto-configuration interfaces (All Interfaces) on page 160
clear auto-configuration interfaces (Single Dynamically Created Interface) on page 160

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear auto-configuration interfaces (All Interfaces)

```
user@host> clear auto-configuration interfaces ge-1/0/0
10 interfaces removed from device ge-1/0/0
```

clear auto-configuration interfaces (Single Dynamically Created Interface)

```
user@host> clear auto-configuration interfaces ge-1/0/0.1073741824
Interface ge-1/0/0.1073741824 deleted
```

clear auto-configuration interfaces interface-set

Syntax clear auto-configuration interfaces interface-set *interface-set-name*

Release Information Command introduced in Junos OS Release 12.2.

Description Clear a specified dynamic agent circuit identifier (ACI) interface set on the router. An ACI interface set is a logical collection of dynamic VLAN subscriber interfaces that originate at the same household or on the same access-loop port.

You can clear only those ACI interface sets that have no active subscriber interface members. If the ACI interface set that you want to clear still has valid member interfaces, you must first remove these interfaces before issuing the **clear auto-configuration interfaces interface-set *interface-set-name*** command.

Options *interface-set-name*—Name of the empty ACI interface set that you want to clear. Use the ACI interface set name generated by the router, such as aci-1003-ge-1/0/0.4001, and not the actual agent circuit identifier string found in the DHCP or PPPoE control packets. To view the names of the ACI interface sets configured on the router, you can issue the **show subscribers** command.

Required Privilege Level view

Related Documentation
- Clearing Agent Circuit Identifier Interface Sets on page 156

List of Sample Output
clear auto-configuration interfaces interface-set on page 161
clear auto-configuration interfaces interface-set (Error Message for ACI Interface Set with Active Members) on page 161

Output Fields When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear auto-configuration interfaces interface-set

```
user@host> clear auto-configuration interfaces interface-set aci-1003-ge-1/0/0.4001
Interface-set aci-1003-ge-1/0/0.4001 deleted
```

clear auto-configuration interfaces interface-set (Error Message for ACI Interface Set with Active Members)

```
user@host> clear auto-configuration interfaces interface-set aci-1005-ge-1/0/0.2800
error: Interface set aci-1005-ge-1/0/0.2800 has references.
```

show class-of-service interface

Syntax show class-of-service interface
<**comprehensive** | **detail**> <*interface-name*>

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 9.0 for EX Series switches.
Forwarding class map information added in Junos OS Release 9.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 12.1 for the PTX Series Packet Transport Routers.
Command introduced in Junos OS Release 12.2 for the ACX Series Universal Access routers.
Options **detail** and **comprehensive** introduced in Junos OS Release 11.4.

Description Display the logical and physical interface associations for the classifier, rewrite rules, and scheduler map objects.

Options **none**—Display CoS associations for all physical and logical interfaces.

comprehensive—(M Series, MX Series, and T Series routers) (Optional) Display comprehensive quality-of-service (QoS) information about all physical and logical interfaces.

detail—(M Series, MX Series, and T Series routers) (Optional) Display QoS and CoS information based on the interface.

If the **interface** *interface-name* is a physical interface, the output includes:

- Brief QoS information about the physical interface
- Brief QoS information about the logical interface
- CoS information about the physical interface
- Brief information about filters or policers of the logical interface
- Brief CoS information about the logical interface

If the **interface** *interface-name* is a logical interface, the output includes:

- Brief QoS information about the logical interface
- Information about filters or policers for the logical interface
- CoS information about the logical interface

interface-name—(Optional) Display class-of-service (CoS) associations for the specified interface.

Required Privilege Level view

List of Sample Output show class-of-service interface (Physical) on page 173

show class-of-service interface (Logical) on page 174
show class-of-service interface (Gigabit Ethernet) on page 174
show class-of-service interface (PPPoE Interface) on page 174
show class-of-service interface (T4000 Routers with Type 5 FPCs) on page 174
show class-of-service interface detail on page 175
show class-of-service interface comprehensive on page 175
show class-of-service interface (ACX Series Routers) on page 186

Output Fields Table 5 on page 163 describes the output fields for the **show class-of-service interface** command. Output fields are listed in the approximate order in which they appear.

Table 5: show class-of-service interface Output Fields

Field Name	Field Description
Physical interface	Name of a physical interface.
Index	Index of this interface or the internal index of this object.
Dedicated Queues	Status of dedicated queues configured on an interface. Supported only on Trio MPC/MIC interfaces on MX Series routers.
Queues supported	Number of queues you can configure on the interface.
Queues in use	Number of queues currently configured.
Total non-default queues created	Number of queues created in addition to the default queues. Supported only on Trio MPC/MIC interfaces on MX Series routers.
Rewrite Input IEEE Code-point	(QFX Series only) IEEE 802.1p code point (priority) rewrite value. Incoming traffic from the Fibre Channel (FC) SAN is classified into the forwarding class specified in the native FC interface (NP_Port) fixed classifier and uses the priority specified as the IEEE 802.1p rewrite value.
Shaping rate	Maximum transmission rate on the physical interface. You can configure the shaping rate on the physical interface, or on the logical interface, but not on both. Therefore, the **Shaping rate** field is displayed for either the physical interface or the logical interface.
Scheduler map	Name of the output scheduler map associated with this interface.
Scheduler map forwarding class sets	(QFX Series only) Name of the fabric forwarding class set scheduler map associated with a QFabric system Interconnect device interface.
Input shaping rate	For Gigabit Ethernet IQ2 PICs, maximum transmission rate on the input interface.
Input scheduler map	For Gigabit Ethernet IQ2 PICs, name of the input scheduler map associated with this interface.
Chassis scheduler map	Name of the scheduler map associated with the packet forwarding component queues.
Rewrite	Name and type of the rewrite rules associated with this interface.
Classifier	Name and type of classifiers associated with this interface.

Table 5: show class-of-service interface Output Fields *(continued)*

Field Name	Field Description
Forwarding-class-map	Name of the forwarding map associated with this interface.
Congestion-notification	(QFX Series only) Congestion notification state, **enabled** or **disabled**.
Logical interface	Name of a logical interface.
Object	Category of an object: **Classifier**, **Fragmentation-map** (for LSQ interfaces only), **Scheduler-map**, **Rewrite**, **Translation Table** (for IQE PICs only), or **traffic-class-map** (for T4000 routers with Type 5 FPCs).
Name	Name of an object.
Type	Type of an object: **dscp**, **dscp-ipv6**, **exp**, **ieee-802.1**, **ip**, **inet-precedence**, or **ieee-802.1ad** (for traffic class map on T4000 routers with Type 5 FPCs)..
Link-level type	Encapsulation on the physical interface.
MTU	MTU size on the physical interface.
Speed	Speed at which the interface is running.
Loopback	Whether loopback is enabled and the type of loopback.
Source filtering	Whether source filtering is enabled or disabled.
Flow control	Whether flow control is enabled or disabled.
Auto-negotiation	(Gigabit Ethernet interfaces) Whether autonegotiation is enabled or disabled.
Remote-fault	(Gigabit Ethernet interfaces) Remote fault status. • **Online**—Autonegotiation is manually configured as online. • **Offline**—Autonegotiation is manually configured as offline.

Table 5: show class-of-service interface Output Fields *(continued)*

Field Name	Field Description
Device flags	The **Device flags** field provides information about the physical device and displays one or more of the following values: • **Down**—Device has been administratively disabled. • **Hear-Own-Xmit**—Device receives its own transmissions. • **Link-Layer-Down**—The link-layer protocol has failed to connect with the remote endpoint. • **Loopback**—Device is in physical loopback. • **Loop-Detected**—The link layer has received frames that it sent, thereby detecting a physical loopback. • **No-Carrier**—On media that support carrier recognition, no carrier is currently detected. • **No-Multicast**—Device does not support multicast traffic. • **Present**—Device is physically present and recognized. • **Promiscuous**—Device is in promiscuous mode and recognizes frames addressed to all physical addresses on the media. • **Quench**—Transmission on the device is quenched because the output buffer is overflowing. • **Recv-All-Multicasts**—Device is in multicast promiscuous mode and therefore provides no multicast filtering. • **Running**—Device is active and enabled.

Interface flags	The **Interface flags** field provides information about the physical interface and displays one or more of the following values:
	• **Admin-Test**—Interface is in test mode and some sanity checking, such as loop detection, is disabled.
	• **Disabled**—Interface is administratively disabled.
	• **Down**—A hardware failure has occurred.
	• **Hardware-Down**—Interface is nonfunctional or incorrectly connected.
	• **Link-Layer-Down**—Interface keepalives have indicated that the link is incomplete.
	• **No-Multicast**—Interface does not support multicast traffic.
	• **No-receive No-transmit**—Passive monitor mode is configured on the interface.
	• **Point-To-Point**—Interface is point-to-point.
	• **Pop all MPLS labels from packets of depth**—MPLS labels are removed as packets arrive on an interface that has the **pop-all-labels** statement configured. The depth value can be one of the following:
	  ◦ **1**—Takes effect for incoming packets with one label only.
	  ◦ **2**—Takes effect for incoming packets with two labels only.
	  ◦ **[1 2]**—Takes effect for incoming packets with either one or two labels.
	• **Promiscuous**—Interface is in promiscuous mode and recognizes frames addressed to all physical addresses.
	• **Recv-All-Multicasts**—Interface is in multicast promiscuous mode and provides no multicast filtering.
	• **SNMP-Traps**—SNMP trap notifications are enabled.
	• **Up**—Interface is enabled and operational.

Table 5: show class-of-service interface Output Fields *(continued)*

Field Name	Field Description
Flags	The **Logical interface flags** field provides information about the logical interface and displays one or more of the following values: • **ACFC Encapsulation**—Address control field Compression (ACFC) encapsulation is enabled (negotiated successfully with a peer). • **Device-down**—Device has been administratively disabled. • **Disabled**—Interface is administratively disabled. • **Down**—A hardware failure has occurred. • **Clear-DF-Bit**—GRE tunnel or IPsec tunnel is configured to clear the Don't Fragment (DF) bit. • **Hardware-Down**—Interface protocol initialization failed to complete successfully. • **PFC**—Protocol field compression is enabled for the PPP session. • **Point-To-Point**—Interface is point-to-point. • **SNMP-Traps**—SNMP trap notifications are enabled. • **Up**—Interface is enabled and operational.
Encapsulation	Encapsulation on the logical interface.
Admin	Administrative state of the interface (**Up** or **Down**)
Link	Status of physical link (**Up** or **Down**).
Proto	Protocol configured on the interface.
Input Filter	Names of any firewall filters to be evaluated when packets are received on the interface, including any filters attached through activation of dynamic service.
Output Filter	Names of any firewall filters to be evaluated when packets are transmitted on the interface, including any filters attached through activation of dynamic service.
Link flags	Provides information about the physical link and displays one or more of the following values: • **ACFC**—Address control field compression is configured. The Point-to-Point Protocol (PPP) session negotiates the ACFC option. • **Give-Up**—Link protocol does not continue connection attempts after repeated failures. • **Loose-LCP**—PPP does not use the Link Control Protocol (LCP) to indicate whether the link protocol is operational. • **Loose-LMI**—Frame Relay does not use the Local Management Interface (LMI) to indicate whether the link protocol is operational. • **Loose-NCP**—PPP does not use the Network Control Protocol (NCP) to indicate whether the device is operational. • **Keepalives**—Link protocol keepalives are enabled. • **No-Keepalives**—Link protocol keepalives are disabled. • **PFC**—Protocol field compression is configured. The PPP session negotiates the PFC option.
Hold-times	Current interface hold-time up and hold-time down, in milliseconds.
CoS queues	Number of CoS queues configured.

Table 5: show class-of-service interface Output Fields *(continued)*

Field Name	Field Description
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).**
Statistics last cleared	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.
IPv6 transit statistics	Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled.
Input errors	Input errors on the interface. The labels are explained in the following list: • **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. • **Giants**—Number of frames received that are larger than the giant threshold. • **Bucket Drops**—Drops resulting from the traffic load exceeding the interface transmit or receive leaky bucket configuration. • **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. Layer 3 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. • **HS link CRC errors**—Number of errors on the high-speed links between the ASICs responsible for handling the router interfaces. • **HS link FIFO overflows**—Number of FIFO overflows on the high-speed links between the ASICs responsible for handling the router interfaces.

Table 5: show class-of-service interface Output Fields *(continued)*

Field Name	Field Description
Output errors	Output errors on the interface. The labels are explained in the following list: • **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 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 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. NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), the **Drops** field does not always use the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs. • **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. • **HS link FIFO underflows**—Number of FIFO underflows on the high-speed links between the ASICs responsible for handling the router interfaces. • **MTU errors**—Number of packets whose size exceeds the MTU of the interface.
Egress queues	Total number of egress queues supported on the specified interface.
Queue counters	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. NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), the **Dropped packets** field does not always display the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs.
SONET alarms **SONET defects**	(SONET) SONET media-specific alarms and defects that prevent the interface from passing packets. When a defect persists for a certain period, it is promoted to an alarm. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router or light the red or yellow alarm LED on the craft interface. See these fields for possible alarms and defects: **SONET PHY**, **SONET section**, **SONET line**, and **SONET path**.
SONET PHY	Counts of specific SONET errors with detailed information. • **Seconds**—Number of seconds the defect has been active. • **Count**—Number of times that the defect has gone from inactive to active. • **State**—State of the error. A state other than **OK** indicates a problem. The **SONET PHY** field has the following subfields: • **PLL Lock**—Phase-locked loop • **PHY Light**—Loss of optical signal

Table 5: show class-of-service interface Output Fields *(continued)*

Field Name	Field Description
SONET section	Counts of specific SONET errors with detailed information. • **Seconds**—Number of seconds the defect has been active. • **Count**—Number of times that the defect has gone from inactive to active. • **State**—State of the error. A state other than **OK** indicates a problem. The **SONET section** field has the following subfields: • **BIP-B1**—Bit interleaved parity for SONET section overhead • **SEF**—Severely errored framing • **LOS**—Loss of signal • **LOF**—Loss of frame • **ES-S**—Errored seconds (section) • **SES-S**—Severely errored seconds (section) • **SEFS-S**—Severely errored framing seconds (section)
SONET line	Active alarms and defects, plus counts of specific SONET errors with detailed information. • **Seconds**—Number of seconds the defect has been active. • **Count**—Number of times that the defect has gone from inactive to active. • **State**—State of the error. A state other than **OK** indicates a problem. The **SONET line** field has the following subfields: • **BIP-B2**—Bit interleaved parity for SONET line overhead • **REI-L**—Remote error indication (near-end line) • **RDI-L**—Remote defect indication (near-end line) • **AIS-L**—Alarm indication signal (near-end line) • **BERR-SF**—Bit error rate fault (signal failure) • **BERR-SD**—Bit error rate defect (signal degradation) • **ES-L**—Errored seconds (near-end line) • **SES-L**—Severely errored seconds (near-end line) • **UAS-L**—Unavailable seconds (near-end line) • **ES-LFE**—Errored seconds (far-end line) • **SES-LFE**—Severely errored seconds (far-end line) • **UAS-LFE**—Unavailable seconds (far-end line)

Table 5: show class-of-service interface Output Fields *(continued)*

Field Name	Field Description
SONET path	Active alarms and defects, plus counts of specific SONET errors with detailed information. • **Seconds**—Number of seconds the defect has been active. • **Count**—Number of times that the defect has gone from inactive to active. • **State**—State of the error. A state other than **OK** indicates a problem. The **SONET path** field has the following subfields: • **BIP-B3**—Bit interleaved parity for SONET section overhead • **REI-P**—Remote error indication • **LOP-P**—Loss of pointer (path) • **AIS-P**—Path alarm indication signal • **RDI-P**—Path remote defect indication • **UNEQ-P**—Path unequipped • **PLM-P**—Path payload (signal) label mismatch • **ES-P**—Errored seconds (near-end STS path) • **SES-P**—Severely errored seconds (near-end STS path) • **UAS-P**—Unavailable seconds (near-end STS path) • **ES-PFE**—Errored seconds (far-end STS path) • **SES-PFE**—Severely errored seconds (far-end STS path) • **UAS-PFE**—Unavailable seconds (far-end STS path)
Received SONET overhead **Transmitted SONET overhead**	Values of the received and transmitted SONET overhead: • **C2**—Signal label. Allocated to identify the construction and content of the STS-level SPE and for PDI-P. • **F1**—Section user channel byte. This byte is set aside for the purposes of users. • **K1** and **K2**—These bytes are allocated for APS signaling for the protection of the multiplex section. • **J0**—Section trace. This byte is defined for STS-1 number 1 of an STS-*N* signal. Used to transmit a 1-byte fixed-length string or a 16-byte message so that a receiving terminal in a section can verify its continued connection to the intended transmitter. • **S1**—Synchronization status. The S1 byte is located in the first STS-1 number of an STS-*N* signal. • **Z3** and **Z4**—Allocated for future use.
Received path trace **Transmitted path trace**	SONET/SDH interfaces allow path trace bytes to be sent inband across the SONET/SDH link. Juniper Networks and other router manufacturers use these bytes to help diagnose misconfigurations and network errors by setting the transmitted path trace message so that it contains the system hostname and name of the physical interface. The received path trace value is the message received from the router at the other end of the fiber. The transmitted path trace value is the message that this router transmits.
HDLC configuration	Information about the HDLC configuration. • **Policing bucket**—Configured state of the receiving policer. • **Shaping bucket**—Configured state of the transmitting shaper. • **Giant threshold**—Giant threshold programmed into the hardware. • **Runt threshold**—Runt threshold programmed into the hardware.

Table 5: show class-of-service interface Output Fields *(continued)*

Field Name	Field Description
Packet Forwarding Engine configuration	Information about the configuration of the Packet Forwarding Engine: • **Destination slot**—FPC slot number. • **PLP byte**—Packet Level Protocol byte.
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.
Forwarding classes	Total number of forwarding classes supported on the specified interface.
Egress queues	Total number of egress queues supported on the specified interface.
Queue	Queue number.
Forwarding classes	Forwarding class name.
Queued Packets	Number of packets queued to this queue.
Queued Bytes	Number of bytes queued to this queue. The byte counts vary by PIC type.
Transmitted Packets	Number of packets transmitted by this queue. When fragmentation occurs on the egress interface, the first set of packet counters shows the postfragmentation values. The second set of packet counters (displayed under the **Packet Forwarding Engine Chassis Queues** field) shows the prefragmentation values.
Transmitted Bytes	Number of bytes transmitted by this queue. The byte counts vary by PIC type.
Tail-dropped packets	Number of packets dropped because of tail drop.

Table 5: show class-of-service interface Output Fields *(continued)*

Field Name	Field Description

RED-dropped packets	Number of packets dropped because of random early detection (RED).
	• (M Series and T Series routers only) On M320 and M120 routers and the T Series routers, the total number of dropped packets is displayed. On all other M Series routers, the output classifies dropped packets into the following categories:
	  • **Low, non-TCP**—Number of low-loss priority non-TCP packets dropped because of RED.
	  • **Low, TCP**—Number of low-loss priority TCP packets dropped because of RED.
	  • **High, non-TCP**—Number of high-loss priority non-TCP packets dropped because of RED.
	  • **High, TCP**—Number of high-loss priority TCP packets dropped because of RED.
	• (MX Series routers with enhanced DPCs, and T Series routers with enhanced FPCs only) The output classifies dropped packets into the following categories:
	  • **Low**—Number of low-loss priority packets dropped because of RED.
	  • **Medium-low**—Number of medium-low loss priority packets dropped because of RED.
	  • **Medium-high**—Number of medium-high loss priority packets dropped because of RED.
	  • **High**—Number of high-loss priority packets dropped because of RED.
	NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), this field does not always display the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs.

RED-dropped bytes	Number of bytes dropped because of RED. The byte counts vary by PIC type.
	• (M Series and T Series routers only) On M320 and M120 routers and the T Series routers, only the total number of dropped bytes is displayed. On all other M Series routers, the output classifies dropped bytes into the following categories:
	  • **Low, non-TCP**—Number of low-loss priority non-TCP bytes dropped because of RED.
	  • **Low, TCP**—Number of low-loss priority TCP bytes dropped because of RED.
	  • **High, non-TCP**—Number of high-loss priority non-TCP bytes dropped because of RED.
	  • **High, TCP**—Number of high-loss priority TCP bytes dropped because of RED.
	NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), this field does not always display the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs.

Transmit rate	Configured transmit rate of the scheduler. The rate is a percentage of the total interface bandwidth.
Rate Limit	Rate limiting configuration of the queue. Possible values are : • **None**—No rate limit. • **exact**—Queue transmits at the configured rate.
Buffer size	Delay buffer size in the queue.
Priority	Scheduling priority configured as **low** or **high**.
Excess Priority	Priority of the excess bandwidth traffic on a scheduler: **low**, **medium-low**, **medium-high**, **high**, or **none**.

Table 5: show class-of-service interface Output Fields *(continued)*

Field Name	Field Description
Drop profiles	Display the assignment of drop profiles. • **Loss priority**—Packet loss priority for drop profile assignment. • **Protocol**—Transport protocol for drop profile assignment. • **Index**—Index of the indicated object. Objects that have indexes in this output include schedulers and drop profiles. • **Name**—Name of the drop profile. • **Type**—Type of the drop profile: **discrete** or **interpolated**. • **Fill Level**—Percentage fullness of a queue. • **Drop probability**—Drop probability at this fill level.
Excess Priority	Priority of the excess bandwidth traffic on a scheduler.
Drop profiles	Display the assignment of drop profiles. • **Loss priority**—Packet loss priority for drop profile assignment. • **Protocol**—Transport protocol for drop profile assignment. • **Index**—Index of the indicated object. Objects that have indexes in this output include schedulers and drop profiles. • **Name**—Name of the drop profile. • **Type**—Type of the drop profile: **discrete** or **interpolated**. • **Fill Level**—Percentage fullness of a queue. • **Drop probability**—Drop probability at this fill level.
Adjustment information	Display the assignment of shaping-rate adjustments on a scheduler node or queue. • **Adjusting application**—Application that is performing the shaping-rate adjustment. ◦ The adjusting application can appear as **ancp LS-0**, which is the Junos OS Access Node Control Profile process (**ancpd**) that performs shaping-rate adjustments on schedule nodes. ◦ The adjusting application can also appear as **pppoe**, which adjusts the shaping-rate and overhead-accounting class-of-service attributes on dynamic subscriber interfaces in a broadband access network based on access line parameters in Point-to-Point Protocol over Ethernet (PPPoE) Tags [TR-101]. This feature is supported on MPC/MIC interfaces on MX Series routers. The shaping rate is based on the actual-data-rate-downstream attribute. The overhead accounting value is based on the access-loop-encapsulation attribute and specifies whether the access loop uses Ethernet (frame mode) or ATM (cell mode). • **Adjustment type**—Type of adjustment: **absolute** or **delta**. • **Configured shaping rate**—Shaping rate configured for the scheduler node or queue. • **Adjustment value**—Value of adjusted shaping rate. • **Adjustment target**—Level of shaping-rate adjustment performed: **node** or **queue**. • **Adjustment overhead-accounting mode**—Configured shaping mode: **frame** or **cell**.

Sample Output

show class-of-service interface (Physical)

```
user@host> show class-of-service interface so-0/2/3
Physical interface: so-0/2/3, Index: 135
Queues supported: 8, Queues in use: 4
```

```
Total non-default queues created: 4
  Scheduler map: <default>, Index: 2032638653

  Logical interface: fe-0/0/1.0, Index: 68, Dedicated Queues: no
    Shaping rate: 32000
    Object                  Name                  Type           Index
    Scheduler-map           <default>                             27
    Rewrite                 exp-default           exp             21
    Classifier              exp-default           exp             5
    Classifier              ipprec-compatibility  ip              8
    Forwarding-class-map    exp-default           exp             5
```

show class-of-service interface (Logical)

```
user@host> show class-of-service interface so-0/2/3.0
Logical interface: so-0/2/3.0, Index: 68, Dedicated Queues: no
    Shaping rate: 32000
    Object                  Name                  Type             Index
    Scheduler-map           <default>                               27
    Rewrite                 exp-default           exp               21
    Classifier              exp-default           exp               5
    Classifier              ipprec-compatibility  ip                8
    Forwarding-class-map    exp-default           exp               5
```

show class-of-service interface (Gigabit Ethernet)

```
user@host> show class-of-service interface ge-6/2/0
Physical interface: ge-6/2/0, Index: 175
Queues supported: 4, Queues in use: 4
  Scheduler map: <default>, Index: 2
  Input scheduler map: <default>, Index: 3
  Chassis scheduler map: <default-chassis>, Index: 4
```

show class-of-service interface (PPPoE Interface)

```
user@host> show class-of-service interface pp0.1
Logical interface: pp0.1, Index: 85
    Object                  Name                  Type           Index
    Traffic-control-profile tcp-pppoe.o.pp0.1     Output         2726446535
    Classifier              ipprec-compatibility  ip             13

    Adjusting application: PPPoE
      Adjustment type: absolute
      Adjustment value: 5000000
      Adjustment overhead-accounting mode: cell
      Adjustment target: node
```

show class-of-service interface (T4000 Routers with Type 5 FPCs)

```
user@host> show class-of-service interface xe-4/0/0
Physical interface: xe-4/0/0, Index: 153
    Queues supported: 8, Queues in use: 4
      Shaping rate: 5000000000 bps
      Scheduler map: <default>, Index: 2
      Congestion-notification: Disabled

      Logical interface: xe-4/0/0.0, Index: 77
        Object                  Name                    Type
Index
        Classifier              ipprec-compatibility    ip
  13
```

show class-of-service interface detail

```
user@host> show class-of-service interface ge-0/3/0 detail

Physical interface: ge-0/3/0, Enabled, Physical link is Up
  Link-level type: Ethernet, MTU: 1518, 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

  Physical interface: ge-0/3/0, Index: 138
  Queues supported: 4, Queues in use: 5
  Shaping rate: 50000 bps
  Scheduler map: interface-schedular-map, Index: 58414
  Input shaping rate: 10000 bps
878674  Input scheduler map: schedular-map, Index: 15103
  Chassis scheduler map: <default-chassis>, Index: 4
  Congestion-notification: Disabled

  Logical interface ge-0/3/0.0
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.1 ]  Encapsulation: ENET2
    inet
    mpls
Interface       Admin Link Proto Input Filter         Output Filter
ge-0/3/0.0      up    up   inet
                           mpls
Interface       Admin Link Proto Input Policer         Output Policer
ge-0/3/0.0      up    up   inet
                           mpls

  Logical interface: ge-0/3/0.0, Index: 68
    Object                 Name                   Type               Index
    Rewrite                exp-default            exp (mpls-any)       33
    Classifier             exp-default            exp                  10
    Classifier             ipprec-compatibility   ip                   13


  Logical interface ge-0/3/0.1
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.2 ]  Encapsulation: ENET2
    inet
Interface       Admin Link Proto Input Filter         Output Filter
ge-0/3/0.1      up    up   inet
Interface       Admin Link Proto Input Policer         Output Policer
ge-0/3/0.1      up    up   inet

  Logical interface: ge-0/3/0.1, Index: 69
    Object                 Name                   Type            Index
    Classifier             ipprec-compatibility   ip               13
```

show class-of-service interface comprehensive

```
user@host> show class-of-service interface ge-0/3/0 comprehensive
Physical interface: ge-0/3/0, Enabled, Physical link is Up
  Interface index: 138, SNMP ifIndex: 601, Generation: 141
  Link-level type: Ethernet, MTU: 1518, 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
  Interface flags: SNMP-Traps Internal: 0x4000
```

```
  CoS queues     : 4 supported, 4 maximum usable queues
  Schedulers     : 256
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:14:f6:f4:b4:5d, Hardware address: 00:14:f6:f4:b4:5d
  Last flapped   : 2010-09-07 06:35:22 PDT (15:14:42 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
   IPv6 total statistics:
    Input  bytes  :                  0
    Output bytes  :                  0
    Input  packets:                  0
    Output packets:                  0
  Ingress traffic statistics at Packet Forwarding Engine:
   Input  bytes  :                   0                   0 bps
   Input  packets:                   0                   0 pps
   Drop   bytes  :                   0                   0 bps
   Drop   packets:                   0                   0 pps
  Label-switched interface (LSI) traffic statistics:
   Input  bytes  :                   0                   0 bps
   Input  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: 5, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0,
 FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
  Ingress queues: 4 supported, 5 in use
  Queue counters:       Queued packets  Transmitted packets      Dropped packets

    0 af3                            0                   0                   0

    1 af2                            0                   0                   0

    2 ef2                            0                   0                   0

    3 ef1                            0                   0                   0

  Egress queues: 4 supported, 5 in use
  Queue counters:       Queued packets  Transmitted packets      Dropped packets

    0 af3                            0                   0                   0

    1 af2                            0                   0                   0

    2 ef2                            0                   0                   0

    3 ef1                            0                   0                   0

  Active alarms  : None
  Active defects : None
  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: 0, CAM source filters: 0
  Autonegotiation information:
    Negotiation status: Complete
    Link partner:
       Link mode: Full-duplex, Flow control: Symmetric/Asymmetric, Remote fault:
 OK
    Local resolution:
      Flow control: Symmetric, Remote fault: Link OK
  Packet Forwarding Engine configuration:
    Destination slot: 0
  CoS information:
    Direction : Output
    CoS transmit queue               Bandwidth               Buffer Priority
Limit
                              %            bps     %           usec
    2 ef2                    39          19500     0            120     high
none
    Direction : Input
    CoS transmit queue               Bandwidth               Buffer Priority
Limit
                              %            bps     %           usec
    0 af3                    30           3000    45              0      low
none

Physical interface: ge-0/3/0, Enabled, Physical link is Up
  Interface index: 138, SNMP ifIndex: 601
Forwarding classes: 16 supported, 5 in use
Ingress queues: 4 supported, 5 in use
Queue: 0, Forwarding classes: af3
  Queued:
    Packets              :                      0                      0 pps
    Bytes                :                      0                      0 bps
  Transmitted:
    Packets              :                      0                       0 pps
    Bytes                :                      0                      0 bps
    Tail-dropped packets : Not Available
    RED-dropped packets  :                      0                      0 pps
    RED-dropped bytes    :                      0                      0 bps
Queue: 1, Forwarding classes: af2
  Queued:
    Packets              :                      0                      0 pps
    Bytes                :                      0                      0 bps
  Transmitted:
    Packets              :                      0                       0 pps
```

```
    Bytes               :                    0                    0 bps
    Tail-dropped packets : Not Available
    RED-dropped packets  :                    0                    0 pps
    RED-dropped bytes    :                    0                    0 bps
Queue: 2, Forwarding classes: ef2
  Queued:
    Packets             :                    0                    0 pps
    Bytes               :                    0                    0 bps
  Transmitted:
    Packets             :                    0                    0 pps
    Bytes               :                    0                    0 bps
    Tail-dropped packets : Not Available
    RED-dropped packets  :                    0                    0 pps
    RED-dropped bytes    :                    0                    0 bps
Queue: 3, Forwarding classes: ef1
  Queued:
    Packets             :                    0                    0 pps
    Bytes               :                    0                    0 bps
  Transmitted:
    Packets             :                    0                    0 pps
    Bytes               :                    0                    0 bps
    Tail-dropped packets : Not Available
    RED-dropped packets  :                    0                    0 pps
    RED-dropped bytes    :                    0                    0 bps
Forwarding classes: 16 supported, 5 in use
Egress queues: 4 supported, 5 in use
Queue: 0, Forwarding classes: af3
  Queued:
    Packets             :                    0                    0 pps
    Bytes               :                    0                    0 bps
  Transmitted:
    Packets             :                    0                    0 pps
    Bytes               :                    0                    0 bps
    Tail-dropped packets : Not Available
    RL-dropped packets   :                    0                    0 pps
    RL-dropped bytes     :                    0                    0 bps
    RED-dropped packets  :                    0                    0 pps
    RED-dropped bytes    :                    0                    0 bps
Queue: 1, Forwarding classes: af2
  Queued:
    Packets             :                    0                    0 pps
    Bytes               :                    0                    0 bps
  Transmitted:
    Packets             :                    0                    0 pps
    Bytes               :                    0                    0 bps
    Tail-dropped packets : Not Available
    RL-dropped packets   :                    0                    0 pps
    RL-dropped bytes     :                    0                    0 bps
    RED-dropped packets  :                    0                    0 pps
    RED-dropped bytes    :                    0                    0 bps
Queue: 2, Forwarding classes: ef2
  Queued:
    Packets             :                    0                    0 pps
    Bytes               :                    0                    0 bps
  Transmitted:
    Packets             :                    0                    0 pps
    Bytes               :                    0                    0 bps
    Tail-dropped packets : Not Available
    RL-dropped packets   :                    0                    0 pps
    RL-dropped bytes     :                    0                    0 bps
    RED-dropped packets  :                    0                    0 pps
```

```
    RED-dropped bytes    :                    0                    0 bps
Queue: 3, Forwarding classes: ef1
  Queued:
    Packets              :                    0                    0 pps
    Bytes                :                    0                    0 bps
  Transmitted:
    Packets              :                    0                    0 pps
    Bytes                :                    0                    0 bps
    Tail-dropped packets : Not Available
    RL-dropped packets   :                    0                    0 pps
    RL-dropped bytes     :                    0                    0 bps
    RED-dropped packets  :                    0                    0 pps
    RED-dropped bytes    :                    0                    0 bps

Packet Forwarding Engine Chassis Queues:
Queues: 4 supported, 5 in use
Queue: 0, Forwarding classes: af3
  Queued:
    Packets              :                    0                    0 pps
    Bytes                :                    0                    0 bps
  Transmitted:
    Packets              :                    0                    0 pps
    Bytes                :                    0                    0 bps
    Tail-dropped packets :                    0                    0 pps
    RED-dropped packets  : Not Available
    RED-dropped bytes    : Not Available
Queue: 1, Forwarding classes: af2
  Queued:
    Packets              :                    0                    0 pps
    Bytes                :                    0                    0 bps
  Transmitted:
    Packets              :                    0                    0 pps
    Bytes                :                    0                    0 bps
    Tail-dropped packets :                    0                    0 pps
    RED-dropped packets  : Not Available
    RED-dropped bytes    : Not Available
Queue: 2, Forwarding classes: ef2
  Queued:
    Packets              :                    0                    0 pps
    Bytes                :                    0                    0 bps
  Transmitted:
    Packets              :                    0                    0 pps
    Bytes                :                    0                    0 bps
    Tail-dropped packets :                    0                    0 pps
    RED-dropped packets  : Not Available
    RED-dropped bytes    : Not Available
Queue: 3, Forwarding classes: ef1
  Queued:
    Packets              :               108546                    0 pps
    Bytes                :             12754752                  376 bps
  Transmitted:
    Packets              :               108546                    0 pps
    Bytes                :             12754752                  376 bps
    Tail-dropped packets :                    0                    0 pps
    RED-dropped packets  : Not Available
    RED-dropped bytes    : Not Available

Physical interface: ge-0/3/0, Index: 138
Queues supported: 4, Queues in use: 5
  Shaping rate: 50000 bps
```

```
Scheduler map: interface-schedular-map, Index: 58414

  Scheduler: ef2, Forwarding class: ef2, Index: 39155
    Transmit rate: 39 percent, Rate Limit: none, Buffer size: 120 us, Buffer
Limit: none, Priority: high
    Excess Priority: unspecified
    Drop profiles:
      Loss priority   Protocol    Index    Name
      Low             any             1    < default-drop-profile>
      Medium low      any             1    < default-drop-profile>
      Medium high     any             1    < default-drop-profile>
      High            any             1    < default-drop-profile>
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
  Input shaping rate: 10000 bps
  Input scheduler map: schedular-map

Scheduler map: schedular-map, Index: 15103

  Scheduler: af3, Forwarding class: af3, Index: 35058
    Transmit rate: 30 percent, Rate Limit: none, Buffer size: 45 percent, Buffer
 Limit: none, Priority: low
    Excess Priority: unspecified
    Drop profiles:
      Loss priority   Protocol    Index    Name
      Low             any         40582    green
      Medium low      any             1    < default-drop-profile>
      Medium high     any             1    < default-drop-profile>
      High            any         18928    yellow
Drop profile: green, Type: discrete, Index: 40582
  Fill level    Drop probability
         50                   0
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: yellow, Type: discrete, Index: 18928
  Fill level    Drop probability
         50                   0
        100                 100
  Chassis scheduler map: < default-drop-profile>
Scheduler map: < default-drop-profile>, Index: 4

  Scheduler: < default-drop-profile>, Forwarding class: af3, Index: 25
    Transmit rate: 25 percent, Rate Limit: none, Buffer size: 25 percent, Buffer
 Limit: none, Priority: low
    Excess Priority: low
    Drop profiles:
```

```
      Loss priority   Protocol    Index    Name
      Low             any             1    < default-drop-profile>
      Medium low      any             1    < default-drop-profile>
      Medium high     any             1    < default-drop-profile>
      High            any             1    < default-drop-profile>
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100

  Scheduler: < default-drop-profile>, Forwarding class: af2, Index: 25
    Transmit rate: 25 percent, Rate Limit: none, Buffer size: 25 percent, Buffer
 Limit: none, Priority: low
    Excess Priority: low
    Drop profiles:
      Loss priority   Protocol    Index    Name
      Low             any             1    < default-drop-profile>
      Medium low      any             1    < default-drop-profile>
      Medium high     any             1    < default-drop-profile>
      High            any             1    < default-drop-profile>
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100

  Scheduler: < default-drop-profile>, Forwarding class: ef2, Index: 25
    Transmit rate: 25 percent, Rate Limit: none, Buffer size: 25 percent, Buffer
 Limit: none, Priority: low
    Excess Priority: low
    Drop profiles:
      Loss priority   Protocol    Index    Name
      Low             any             1    < default-drop-profile>
      Medium low      any             1    < default-drop-profile>
      Medium high     any             1    < default-drop-profile>
      High            any             1    < default-drop-profile>
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
```

```
  Fill level    Drop probability
        100                 100

  Scheduler: < default-drop-profile>, Forwarding class: ef1, Index: 25
    Transmit rate: 25 percent, Rate Limit: none, Buffer size: 25 percent, Buffer
 Limit: none, Priority: low
    Excess Priority: low
    Drop profiles:
      Loss priority   Protocol    Index    Name
      Low             any             1    < default-drop-profile>
      Medium low      any             1    < default-drop-profile>
      Medium high     any             1    < default-drop-profile>
      High            any             1    < default-drop-profile>
Drop profile: , Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
Drop profile: < default-drop-profile>, Type: discrete, Index: 1
  Fill level    Drop probability
        100                 100
  Congestion-notification: Disabled
Forwarding class                      ID      Queue  Restricted queue  Fabric
priority  Policing priority
  af3                                  0       0          0             low
            normal
  af2                                  1       1          1             low
            normal
  ef2                                  2       2          2             high
            normal
  ef1                                  3       3          3             high
            normal
  af1                                  4       4          0             low
            normal

  Logical interface ge-0/3/0.0 (Index 68) (SNMP ifIndex 152) (Generation 159)
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.1 ]  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
    Protocol inet, MTU: 1500, Generation: 172, Route table: 0
      Flags: Sendbcast-pkt-to-re
      Input Filters: filter-in-ge-0/3/0.0-i,
      Policer: Input: p1-ge-0/3/0.0-inet-i
    Protocol mpls, MTU: 1488, Maximum labels: 3, Generation: 173, Route table: 0
```

```
      Flags: Is-Primary
      Output Filters: exp-filter,,,,,

Logical interface ge-1/2/0.0 (Index 347) (SNMP ifIndex 638) (Generation 156)

Forwarding class ID  Queue  Restricted queue  Fabric priority  Policing priority
   SPU priority
best-effort      0   0      0                 low              normal
    low

Aggregate Forwarding-class statistics per forwarding-class
  Aggregate Forwarding-class statistics:
   Forwarding-class statistics:

Forwarding-class best-effort statistics:
    Input unicast bytes:      0
    Output unicast bytes:     0
    Input unicast packets:    0
    Output unicast packets:   0

    Input multicast bytes:    0
    Output multicast bytes:   0
    Input multicast packets:  0
    Output multicast packets: 0

Forwarding-class expedited-forwarding statistics:
    Input unicast bytes:      0
    Output unicast bytes:     0
    Input unicast packets:    0
    Output unicast packets:   0

    Input multicast bytes:    0
    Output multicast bytes:   0
    Input multicast packets:  0
    Output multicast packets: 0

IPv4 protocol forwarding-class statistics:
  Forwarding-class statistics:
  Forwarding-class best-effort statistics:

    Input unicast bytes:      0
    Output unicast bytes:     0
    Input unicast packets:    0
    Output unicast packets:   0

    Input multicast bytes:    0
    Output multicast bytes:   0
    Input multicast packets:  0
    Output multicast packets: 0

Forwarding-class expedited-forwarding statistics:
    Input unicast bytes:      0
    Output unicast bytes:     0
    Input unicast packets:    0
    Output unicast packets:   0

    Input multicast bytes:    0
    Output multicast bytes:   0
    Input multicast packets:  0
    Output multicast packets: 0
```

```
    IPv6  protocol forwarding-class statistics:
    Forwarding-class statistics:
     Forwarding-class best-effort statistics:

    Input unicast bytes:      0
    Output unicast bytes:     0
    Input unicast packets:    0
    Output unicast packets:   0

    Input multicast bytes:    0
    Output multicast bytes:   0
    Input multicast packets:  0
    Output multicast packets: 0

Forwarding-class expedited-forwarding statistics:
    Input unicast bytes:      0
    Output unicast bytes:     0
    Input unicast packets:    0
    Output unicast packets:   0

    Input multicast bytes:    0
    Output multicast bytes:   0
    Input multicast packets:  0
    Output multicast packets: 0


 Logical interface ge-0/3/0.0 (Index 68) (SNMP ifIndex 152)
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.1 ]  Encapsulation: ENET2
    Input packets : 0
    Output packets: 0

Interface       Admin Link Proto Input Filter         Output Filter
ge-0/3/0.0      up    up   inet  filter-in-ge-0/3/0.0-i
                           mpls                       exp-filter
Interface       Admin Link Proto Input Policer         Output Policer
ge-0/3/0.0      up    up
                           inet  p1-ge-0/3/0.0-inet-i
                           mpls

Filter: filter-in-ge-0/3/0.0-i
Counters:
Name                                                Bytes              Packets
count-filter-in-ge-0/3/0.0-i                            0                    0

Filter: exp-filter
Counters:
Name                                                Bytes              Packets
count-exp-seven-match                                   0                    0
count-exp-zero-match                                    0                    0
Policers:
Name                                               Packets
p1-ge-0/3/0.0-inet-i                                    0


  Logical interface: ge-0/3/0.0, Index: 68
    Object                 Name                   Type                    Index

    Rewrite                exp-default            exp (mpls-any)             33

Rewrite rule: exp-default, Code point type: exp, Index: 33
```

```
  Forwarding class                  Loss priority       Code point
  af3                               low                 000
  af3                               high                001
  af2                               low                 010
  af2                               high                011
  ef2                               low                 100
  ef2                               high                101
  ef1                               low                 110
  ef1                               high                111
    Object                 Name                  Type                      Index

    Classifier             exp-default           exp                         10

Classifier: exp-default, Code point type: exp, Index: 10
  Code point         Forwarding class                  Loss priority
  000                af3                               low
  001                af3                               high
  010                af2                               low
  011                af2                               high
  100                ef2                               low
  101                ef2                               high
  110                ef1                               low
  111                ef1                               high
    Object                 Name                  Type                      Index

    Classifier             ipprec-compatibility  ip                          13

Classifier: ipprec-compatibility, Code point type: inet-precedence, Index: 13
  Code point         Forwarding class                  Loss priority
  000                af3                               low
  001                af3                               high
  010                af3                               low
  011                af3                               high
  100                af3                               low
  101                af3                               high
  110                ef1                               low
  111                ef1                               high
Forwarding class                    ID      Queue  Restricted queue  Fabric
priority  Policing priority
  af3                               0       0          0             low
            normal
  af2                               1       1          1             low
            normal
  ef2                               2       2          2             high
            normal
  ef1                               3       3          3             high
            normal
  af1                               4       4          0             low
            normal

  Logical interface ge-0/3/0.1 (Index 69) (SNMP ifIndex 154) (Generation 160)
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.2 ]  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
   Protocol inet, MTU: 1500, Generation: 174, Route table: 0
     Flags: Sendbcast-pkt-to-re

  Logical interface ge-0/3/0.1 (Index 69) (SNMP ifIndex 154)
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.2 ]  Encapsulation: ENET2
    Input packets : 0
    Output packets: 0


Interface       Admin Link Proto Input Filter         Output Filter
ge-0/3/0.1      up    up   mpls
Interface       Admin Link Proto Input Policer         Output Policer
ge-0/3/0.1      up    up
                           mpls

  Logical interface: ge-0/3/0.1, Index: 69
    Object                 Name                   Type                    Index

    Classifier             ipprec-compatibility   ip                        13

Classifier: ipprec-compatibility, Code point type: inet-precedence, Index: 13
  Code point         Forwarding class                    Loss priority
  000                af3                                 low
  001                af3                                 high
  010                af3                                 low
  011                af3                                 high
  100                af3                                 low
  101                af3                                 high
  110                ef1                                 low
  111                ef1                                 high
Forwarding class                      ID      Queue  Restricted queue  Fabric
priority  Policing priority
  af3                                  0       0          0             low
            normal
  af2                                  1       1          1             low
            normal
  ef2                                  2       2          2             high
            normal
  ef1                                  3       3          3             high
            normal
  af1                                  4       4          0             low
            normal
```

show class-of-service interface (ACX Series Routers)

```
user@host-g11# show class-of-service interface
Physical interface: at-0/0/0, Index: 130
Queues supported: 4, Queues in use: 4
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled

  Logical interface: at-0/0/0.0, Index: 69
```

```
  Logical interface: at-0/0/0.32767, Index: 70

Physical interface: at-0/0/1, Index: 133
Queues supported: 4, Queues in use: 4
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled

  Logical interface: at-0/0/1.0, Index: 71

  Logical interface: at-0/0/1.32767, Index: 72

Physical interface: ge-0/1/0, Index: 146
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                    Type                    Index
Rewrite                 dscp-default            dscp                       31
Classifier              d1                      dscp                    11331
Classifier              ci                      ieee8021p                 583

  Logical interface: ge-0/1/0.0, Index: 73
Object                  Name                    Type                    Index
Rewrite                 custom-exp              exp (mpls-any)          46413

  Logical interface: ge-0/1/0.1, Index: 74

  Logical interface: ge-0/1/0.32767, Index: 75

Physical interface: ge-0/1/1, Index: 147
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                    Type                    Index
Classifier              ipprec-compatibility    ip                         13

  Logical interface: ge-0/1/1.0, Index: 76

Physical interface: ge-0/1/2, Index: 148
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                    Type                    Index
Rewrite                 ri                      ieee8021p (outer)       35392
Classifier              ci                      ieee8021p                 583

Physical interface: ge-0/1/3, Index: 149
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                    Type                    Index
Classifier              ipprec-compatibility    ip                         13

  Logical interface: ge-0/1/3.0, Index: 77
Object                  Name                    Type                    Index
Rewrite                 custom-exp2             exp (mpls-any)          53581

Physical interface: ge-0/1/4, Index: 150
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                    Type                    Index
```

```
Classifier              ipprec-compatibility   ip                        13

Physical interface: ge-0/1/5, Index: 151
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                   Type                      Index
Classifier              ipprec-compatibility   ip                        13

Physical interface: ge-0/1/6, Index: 152
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                   Type                      Index
Classifier              ipprec-compatibility   ip                        13

Physical interface: ge-0/1/7, Index: 153
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                   Type                      Index
Classifier              d1                     dscp                      11331

Physical interface: ge-0/2/0, Index: 154
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                   Type                      Index
Classifier              ipprec-compatibility   ip                        13

Physical interface: ge-0/2/1, Index: 155
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                   Type                      Index
Classifier              ipprec-compatibility   ip                        13

  Logical interface: ge-0/2/1.0, Index: 78

  Logical interface: ge-0/2/1.32767, Index: 79

Physical interface: xe-0/3/0, Index: 156
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                   Type                      Index
Classifier              ipprec-compatibility   ip                        13

  Logical interface: xe-0/3/0.0, Index: 80

Physical interface: xe-0/3/1, Index: 157
Queues supported: 8, Queues in use: 5
  Scheduler map: <default>, Index: 2
  Congestion-notification: Disabled
Object                  Name                   Type                      Index
Classifier              ipprec-compatibility   ip                        13

  Logical interface: xe-0/3/1.0, Index: 81

[edit]
user@host-g11#
```

show class-of-service interface-set

Syntax **show class-of-service interface-set**
<interface-set-name>

Release Information Command introduced in Junos OS Release 9.4.

Description Display the configured shaping rate and the adjusted shaping rate for each logical interface set configured for hierarchical class of service (CoS).

Options **none**—Display CoS associations for all logical interface sets.

interface-set *interface-set-name*—(Optional) Display CoS associations for the specified interface set.

Required Privilege Level view

List of Sample Output show class-of-service interface-set on page 191

Output Fields Table 6 on page 190 describes the output fields for the **show class-of-service interface-set** command. Output fields are listed in the approximate order in which they appear.

Table 6: show class-of-service interface-set Output Fields

Field Name	Field Description
Interface-set	Name of a logical interface set composed of one or more logical interfaces for which hierarchical scheduling is enabled.
Index	Index number of this interface set or the internal index number of this object.
Physical interface	Name of a physical interface.
Queues supported	Number of queues you can configure on the interface.
Queues in use	Number of queues currently configured.
Output traffic control profile	Name of the output traffic-control profile attached to the logical interface set.

Table 6: show class-of-service interface-set Output Fields *(continued)*

Field Name	Field Description
Adjusting application	Name of the application that communicates shaping-rate adjustment information to the Junos OS class-of-service process (**cosd**) on the broadband services router (BSR). The BSR uses the information from this application to perform shaping-rate adjustments on the scheduler node that manages the interface set. The adjusting application appears as **ancp LS-0** which is the Junos OS Access Node Control Profile process (**ancpd**) that performs shaping-rate adjustments on schedule nodes. The nodes are logical interface sets configured to represent subscriber local loops. When the synchronization speed of the DSL line changes, **ancpd** communicates the local loop speed to **cosd** over the default logical system, **LS-0**, and then the BSR throttles the shaping rate on the scheduler node to the loop speed. The adjusting application can also appear as **PPPoE**, which adjusts the shaping-rate and overhead-accounting class-of-service attributes on dynamic subscriber interfaces in a broadband access network based on access line parameters in Point-to-Point Protocol over Ethernet (PPPoE) Tags [TR-101]. This feature is supported on MPC/MIC interfaces on MX Series routers. The shaping rate is based on the actual data rate downstream attribute. The overhead accounting value is based on the access loop encapsulation attribute and specifies whether the access loop uses Ethernet (frame mode) or ATM (cell mode).
Adjustment type	Type of shaping-rate adjustment performed by the BSR on the scheduler node. The type of adjustment appears as **Adjustment type**, meaning that the configured shaping rate is adjusted by an absolute value as opposed to by a percentage of the configured rate.
Configured shaping rate	The maximum transmission rate on the physical interface as configured by the output traffic-control profile attached to the scheduler node.
Adjustment value	Value of the shaping-rate adjustment information sent by the adjusting application to **cosd**.
Adjustment overhead-accounting mode	Configured shaping mode: **frame** or **cell**.

Sample Output

show class-of-service interface-set

```
user@host> show class-of-service interface-set example-ifset-ge-4/0/0-7
Interface-set: example-ifset-ge-4/0/0-7, Index: 8
Physical interface: ge-4/0/0, Index: 270
Queues supported: 8, Queues in use: 8
  Output traffic control profile: example-tcp-basic-rate, Index: 11395
Adjusting application: ancp LS-0
  Adjustment type: absolute
  Configured shaping rate: 50000000
  Adjustment value: 888000
  Adjustment overhead-accounting mode: cell
```

show class-of-service traffic-control-profile

Syntax show class-of-service traffic-control-profile
<profile-name>

Release Information Command introduced before Junos OS Release 7.4.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Command introduced in Junos OS Release 12.2 for ACX Series Routers.

Description For Gigabit Ethernet IQ PICs, Channelized IQ PICs, EQ DPCs, and Trio MPC/MIC interfaces only, display traffic shaping and scheduling profiles.

(ACX Series routers) For ATM IMA pseudowire interfaces, display traffic shaping and scheduling profiles.

Options **none**—Display all profiles.

profile-name—(Optional) Display information about a single profile.

Required Privilege Level view

List of Sample Output
show class-of-service traffic-control-profile on page 194
show class-of-service traffic-control-profile (MX Series routers with Clear Channel Multi-Rate CE MIC) on page 194
show class-of-service traffic-control-profile (ACX Series routers with ATM IMA pseudowire interfaces) on page 194

Output Fields Table 7 on page 192 describes the output fields for the **show class-of-service traffic-control-profile** command. Output fields are listed in the approximate order in which they appear.

Table 7: show class-of-service traffic-control-profile Output Fields

Field Name	Field Description
Traffic control profile	Name of the traffic control profile.
Index	Index number of the traffic control profile.
ATM Service	(MX Series routers with ATM Multi-Rate CE MIC) Configured category of ATM service. Possible values: • cbr—Constant bit rate. • rtvbr—Real time variable bit rate. • nrtvbr—Non real time variable bit rate. • ubr—Unspecified bit rate.
Maximum Burst Size	Configured maximum burst size, in cells.
Peak rate	Configured peak rate, in cps.

Table 7: show class-of-service traffic-control-profile Output Fields *(continued)*

Field Name	Field Description
Sustained rate	Configured sustained rate, in cps.
Shaping rate	Configured shaping rate, in bps. NOTE: (MX Series routers with ATM Multi-Rate CE MIC) Configured peak rate, in cps.
Shaping rate burst	Configured burst size for the shaping rate, in bytes. NOTE: (MX Series routers with ATM Multi-Rate CE MIC) Configured maximum burst rate, in cells.
Shaping rate priority high	Configured shaping rate for high-priority traffic, in bps.
Shaping rate priority medium	Configured shaping rate for medium-priority traffic, in bps.
Shaping rate priority low	Configured shaping rate for low-priority traffic, in bps.
Shaping rate excess high	Configured shaping rate for high-priority excess traffic, in bps.
Shaping rate excess low	Configured shaping rate for low-priority excess traffic, in bps.
Scheduler map	Name of the associated scheduler map.
Delay Buffer rate	Configured delay buffer rate, in bps.
Excess rate	Configured excess rate, in percent or proportion.
Excess rate high	Configured excess rate for high priority traffic, in percent or proportion.
Excess rate low	Configured excess rate for low priority traffic, in percent or proportion.
Guaranteed rate	Configured guaranteed rate, in bps or cps. NOTE: (MX Series routers with ATM Multi-Rate CE MIC) This value depends on the ATM service category chosen. Possible values: • **cbr**—Guaranteed rate is equal to the configured peak rate in cps. • **rtvbr**—Guaranteed rate is equal to the configured sustained rate in cps. • **nrtvbr**—Guaranteed rate is equal to the configured sustained rate in cps.
Guaranteed rate burst	Configured burst size for the guaranteed rate, in bytes.
adjust-minimum	Configured minimum shaping rate for an adjusted queue, in bps.

Table 7: show class-of-service traffic-control-profile Output Fields *(continued)*

Field Name	Field Description
overhead accounting mode	Configured shaping mode: **Frame Mode** or **Cell Mode**.
Overhead bytes	Configured byte adjustment value.

Sample Output

show class-of-service traffic-control-profile

```
user@host> show class-of-service traffic-control-profile
Traffic control profile: Profile1, Index: 57625
  Scheduler map: m1
  Delay Buffer rate: 500000
  Guaranteed rate: 1000000

Traffic control profile: Profile2, Index: 57624
  Scheduler map: m2
  Delay Buffer rate: 600000
  Guaranteed rate: 2000000

Traffic control profile: Profile3, Index: 57627
  Scheduler map: m3
  Delay Buffer rate: 800000
  Guaranteed rate: 3000000
 .Excess rate high: proportion 4

Traffic control profile: Profile4, Index: 57626
  Scheduler map: m4
  Delay Buffer rate: 750000
  Guaranteed rate: 4000000
..adjust-minimum 20000000
```

show class-of-service traffic-control-profile (MX Series routers with Clear Channel Multi-Rate CE MIC)

```
user@host> show class-of-service traffic-control-profile
Traffic control profile: at-vbr1, Index: 11395
  ATM Service: RTVBR
  Scheduler map: m3
  overhead accounting mode: Frame Mode
  Shaping rate: 1000 cps
  Shaping rate burst: 500 cells
  Delay Buffer rate: 2000 cps
  Guaranteed rate: 1000 cps

Traffic control profile: foo, Index: 38286
  ATM Service: UBR
  Scheduler map: m3
  overhead accounting mode: Frame Mode
```

show class-of-service traffic-control-profile (ACX Series routers with ATM IMA pseudowire interfaces)

```
user@host> show class-of-service traffic-control-profile
Traffic control profile: foo, Index: 38286
  ATM Service: RTVBR
  Shaping rate: 2000 cps
```

```
Shaping rate burst: 200 cells
Scheduler map: <default>
Delay Buffer rate: 1000 cps
Guaranteed rate: 1700 cps
```

show dhcp server binding

Syntax

show dhcp server binding
<*address*>
<*interfaces-vlan*><**brief | detail | summary**>
<**interface** *interface-name*>
<*interfaces-vlan*>
<*interfaces-wildcard*>
<**logical-system** *logical-system-name*>
<**routing-instance** *routing-instance-name*>

Release Information

Command introduced in Junos OS Release 9.0.
Options *interfaces-vlan* and *interfaces-wildcard* added in Junos OS Release 12.1.

Description

Display the address bindings in the client table on the extended Dynamic Host Configuration Protocol (DHCP) local server.

Options

address—(Optional) Display DHCP binding information for a specific client identified by one of the following entries:

- *ip-address*—The specified IP address.
- *mac-address*—The specified MAC address.
- *session-id*—The specified session ID.

brief | detail | summary—(Optional) Display the specified level of output about active client bindings. The default is **brief**, which produces the same output as **show dhcp server binding**.

interface ***interface-name***—(Optional) Display information about active client bindings on the specified interface. You can optionally filter on VLAN ID and SVLAN ID.

interfaces-vlan—(Optional) Show the binding state information on the interface VLAN ID and S-VLAN ID.

interfaces-wildcard—(Optional) The set of interfaces on which to show the binding state information. This option supports the use of the wildcard character (*).

logical-system ***logical-system-name***—(Optional) Display information about active client bindings for DHCP clients on the specified logical system.

routing-instance ***routing-instance-name***—(Optional) Display information about active client bindings for DHCP clients on the specified routing instance.

Required Privilege Level

view

Related Documentation

- *Clearing DHCP Bindings for Subscriber Access*
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155

- *clear dhcp server binding*

List of Sample Output

show dhcp server binding on page 198
show dhcp server binding detail on page 199
show dhcp server binding detail (ACI Interface Set Configured) on page 199
show dhcp server binding interface <vlan-id> on page 199
show dhcp server binding interface <svlan-id> on page 200
show dhcp server binding <ip-address> on page 200
show dhcp server binding <session-id> on page 200
show dhcp server binding summary on page 200
show dhcp server binding <interfaces-vlan> on page 200
show dhcp server binding <interfaces-wildcard> on page 200

Output Fields

Table 8 on page 197 lists the output fields for the **show dhcp server binding** command. Output fields are listed in the approximate order in which they appear.

Table 8: show dhcp server binding Output Fields

Field Name	Field Description	Level of Output
number clients, (*number* init, *number* bound, *number* selecting, *number* requesting, *number* renewing, *number* releasing)	Summary counts of the total number of DHCP clients and the number of DHCP clients in each state.	summary
IP address	IP address of the DHCP client.	brief detail
Session Id	Session ID of the subscriber session.	brief detail
Hardware address	Hardware address of the DHCP client.	brief detail
Expires	Number of seconds in which lease expires.	brief detail
State	State of the address binding table on the extended DHCP local server: • **BOUND**—Client has active IP address lease. • **FORCERENEW**—Client has received forcerenew message from server. • **INIT**—Initial state. • **RELEASE**—Client is releasing IP address lease. • **RENEWING**—Client sending request to renew IP address lease. • **REQUESTING**—Client requesting a DHCP server. • **SELECTING**—Client receiving offers from DHCP servers.	brief detail

Table 8: show dhcp server binding Output Fields *(continued)*

Field Name	Field Description	Level of Output
Interface	Interface on which the request was received.	**brief**
Lease Expires	Date and time at which the client's IP address lease expires.	**detail**
Lease Expires in	Number of seconds in which lease expires.	**detail**
Lease Start	Date and time at which the client's IP address lease started.	**detail**
Lease time violated	Lease time violation has occurred.	**detail**
Last Packet Received	Date and time at which the router received the last packet.	**detail**
Incoming Client Interface	Client's incoming interface.	**detail**
Client Interface Svlan Id	S-VLAN ID of the client's incoming interface.	**detail**
Client Interface Vlan Id	VLAN ID of the client's incoming interface.	**detail**
Demux Interface	Name of the IP demultiplexing (demux) interface.	**detail**
Server IP Address or **Server Identifier**	IP address of DHCP server.	**detail**
Server Interface	Interface of DHCP server.	**detail**
Client Pool Name	Name of address pool used to assign client IP address lease.	**detail**
ACI Interface Set Name	Internally generated name of the dynamic agent circuit identifier (ACI) interface set.	**detail**
ACI Interface Set Index	Index number of the dynamic ACI interface set.	**detail**
ACI Interface Set Session ID	Identifier of the dynamic ACI interface set entry in the session database.	**detail**

Sample Output

show dhcp server binding

```
user@host> show dhcp server binding
IP address        Session Id  Hardware address   Expires     State      Interface
100.20.20.15      6           00:10:94:00:00:01  86180       BOUND      ge-1/0/0.0

100.20.20.16      7           00:10:94:00:00:02  86180       BOUND      ge-1/0/0.0

100.20.20.17      8           00:10:94:00:00:03  86180       BOUND      ge-1/0/0.0

100.20.20.18      9           00:10:94:00:00:04  86180       BOUND      ge-1/0/0.0
```

```
100.20.20.19      10          00:10:94:00:00:05  86180       BOUND      ge-1/0/0.0
```

show dhcp server binding detail

```
user@host> show dhcp server binding detail
Client IP Address:  100.20.20.15
     Hardware Address:             00:10:94:00:00:01
     State:                       BOUND(LOCAL_SERVER_STATE_BOUND_ON_INTF_DELETE)

     Lease Expires:                2009-07-21 10:10:25 PDT
     Lease Expires in:             86151 seconds
     Lease Start:                  2009-07-20 10:10:25 PDT
     Incoming Client Interface:    ge-1/0/0.0
     Server Ip Address:            100.20.20.9
     Server Interface:             none
     Session Id:                   6
     Client Pool Name:             6
     Client IP Address:            100.20.20.16
     Hardware Address:             00:10:94:00:00:02
     State:                       BOUND(LOCAL_SERVER_STATE_BOUND_ON_INTF_DELETE)

     Lease Expires:                2009-07-21 10:10:25 PDT
     Lease Expires in:             86151 seconds
     Lease Start:                  2009-07-20 10:10:25 PDT
     Lease time violated:          yes
     Incoming Client Interface:    ge-1/0/0.0
     Server Ip Address:            100.20.20.9
     Server Interface:             none
     Session Id:                   7
     Client Pool Name:             7
```

show dhcp server binding detail (ACI Interface Set Configured)

```
user@host> show dhcp server binding detail
Client IP Address:  100.20.22.14
     Hardware Address:             00:00:64:34:01:02
     State:                        BOUND(LOCAL_SERVER_STATE_BOUND)
     Lease Expires:                2012-03-13 09:53:32 PDT
     Lease Expires in:             82660 seconds
     Lease Start:                  2012-03-12 10:23:32 PDT
     Last Packet Received:         2012-03-12 10:23:32 PDT
     Incoming Client Interface:    demux0.1073741827
     Client Interface Svlan Id:    1802
     Client Interface Vlan Id:     302
     Demux Interface:              demux0.1073741832
     Server Identifier:            100.20.200.202
     Session Id:                   11
     Client Pool Name:             poolA
     Client Profile Name:          DEMUXprofile
     ACI Interface Set Name:       aci-1002-demux0.1073741827
     ACI Interface Set Index:      2
     ACI Interface Set Session ID: 6
```

show dhcp server binding interface <vlan-id>

```
user@host> show dhcp server binding interface ge-1/1/0:100
IP address        Session Id  Hardware address   Expires     State      Interface
200.20.20.15      6           00:10:94:00:00:01  86124       BOUND
ge-1/1/0:100
```

show dhcp server binding interface <svlan-id>

```
user@host> show dhcp server binding interface ge-1/1/0:10-100
IP address        Session Id  Hardware address   Expires     State      Interface
200.20.20.16       7           00:10:94:00:00:02  86124       BOUND
ge-1/1/0:10-100
```

show dhcp server binding <ip-address>

```
user@host> show dhcp server binding 100.20.20.19
IP address        Session Id  Hardware address   Expires     State      Interface
100.20.20.19      10          00:10:94:00:00:05  86081       BOUND      ge-1/0/0.0
```

show dhcp server binding <session-id>

```
user@host> show dhcp server binding 6
IP address        Session Id  Hardware address   Expires     State      Interface
200.20.20.15      6           00:10:94:00:00:01  86124       BOUND      ge-1/0/0.0
```

show dhcp server binding summary

```
user@host> show dhcp server binding summary
3 clients, (2 init, 1 bound, 0 selecting, 0 requesting, 0 renewing, 0 releasing)
```

show dhcp server binding <interfaces-vlan>

```
user@host> show dhcp server binding ge-1/0/0:100-200
IP address        Session Id  Hardware address   Expires     State      Interface
192.168.0.17       42          00:10:94:00:00:02  86346       BOUND
ge-1/0/0.1073741827
192.168.0.16       41          00:10:94:00:00:01  86346       BOUND
ge-1/0/0.1073741827
```

show dhcp server binding <interfaces-wildcard>

```
user@host> show dhcp server binding ge-1/3/*
IP address        Session Id  Hardware address   Expires     State      Interface
192.168.0.9        24          00:10:94:00:00:04  86361       BOUND
ge-1/3/0.110
192.168.0.8        23          00:10:94:00:00:03  86361       BOUND
ge-1/3/0.110
192.168.0.7        22          00:10:94:00:00:02  86361       BOUND
ge-1/3/0.110
```

show interfaces (Gigabit Ethernet)

Syntax

show interfaces ge-*fpc/pic/port*
<brief | detail | extensive | terse>
<descriptions>
<media>
<snmp-index *snmp-index*>
<statistics>

Release Information

Command introduced before Junos OS Release 7.4.

Description

(M Series, T Series, and MX Series routers and EX Series switches only) Display status information about the specified Gigabit Ethernet interface.

Options

ge-*fpc/pic/port*—Display standard information about the specified Gigabit Ethernet interface.

brief | detail | extensive | terse—(Optional) Display the specified level of output.

descriptions—(Optional) Display interface description strings.

media—(Optional) Display media-specific information about network interfaces.

snmp-index *snmp-index*—(Optional) Display information for the specified SNMP index of the interface.

statistics—(Optional) Display static interface statistics.

Additional Information

In a logical system, this command displays information only about the logical interfaces and not about the physical interfaces.

Required Privilege Level

view

Related Documentation

- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155

List of Sample Output

show interfaces (Gigabit Ethernet) on page 216
show interfaces (Gigabit Ethernet on MX Series Routers) on page 216
show interfaces extensive (Gigabit Ethernet on MX Series Routers showing interface transmit statistics configuration) on page 217
show interfaces brief (Gigabit Ethernet) on page 217
show interfaces detail (Gigabit Ethernet) on page 218
show interfaces extensive (Gigabit Ethernet IQ2) on page 219
show interfaces (Gigabit Ethernet Unnumbered Interface) on page 222
show interfaces (ACI Interface Set Configured) on page 222

Output Fields

Table 9 on page 202 describes the output fields for the **show interfaces** (Gigabit Ethernet) command. Output fields are listed in the approximate order in which they appear. For

Gigabit Ethernet IQ and IQE PICs, the traffic and MAC statistics vary by interface type. For more information, see Table 10 on page 215.

Table 9: show interfaces Gigabit Ethernet 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. Possible values are described in the "Enabled Field" section under *Common Output Fields Description*.	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
Generation	Unique number for use by Juniper Networks technical support only.	**detail extensive**
Link-level type	Encapsulation being used on the physical interface.	All levels
MTU	Maximum transmission unit size on the physical interface.	All levels
Speed	Speed at which the interface is running.	All levels
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
LAN-PHY mode	10-Gigabit Ethernet interface operating in Local Area Network Physical Layer Device (LAN PHY) mode. LAN PHY allows 10-Gigabit Ethernet wide area links to use existing Ethernet applications.	All levels
WAN-PHY mode	10-Gigabit Ethernet interface operating in Wide Area Network Physical Layer Device (WAN PHY) mode. WAN PHY allows 10-Gigabit Ethernet wide area links to use fiber-optic cables and other devices intended for SONET/SDH.	All levels
Unidirectional	Unidirectional link mode status for 10-Gigabit Ethernet interface: **Enabled** or **Disabled** for parent interface; **Rx-only** or **Tx-only** for child interfaces.	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. Possible values are described in the "Device Flags" section under *Common Output Fields Description*.	All levels

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under *Common Output Fields Description*.	All levels
Link flags	Information about the link. Possible values are described in the "Links Flags" section under *Common Output Fields Description*.	All levels
Wavelength	(10-Gigabit Ethernet dense wavelength-division multiplexing [DWDM] interfaces) Displays the configured wavelength, in nanometers (nm).	All levels
Frequency	(10-Gigabit Ethernet DWDM interfaces only) Displays the frequency associated with the configured wavelength, in terahertz (THz).	All levels
CoS queues	Number of CoS queues configured.	**detail extensive** none
Schedulers	(Gigabit Ethernet intelligent queuing 2 [IQ2] interfaces only) Number of CoS schedulers configured.	**extensive**
Hold-times	Current interface hold-time up and hold-time down, in milliseconds (ms).	**detail extensive**
Current address	Configured MAC address.	**detail extensive** none
Hardware address	Hardware MAC address.	**detail extensive** none
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). The value in this field also includes the Layer 2 overhead bytes for ingress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level.	None
Output Rate	Output rate in bps and pps. The value in this field also includes the Layer 2 overhead bytes for egress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level.	None
Statistics last cleared	Time when the statistics for the interface were last set to zero.	**detail extensive**
Egress account overhead	Layer 2 overhead in bytes that is accounted in the interface statistics for egress traffic.	**detail extensive**
Ingress account overhead	Layer 2 overhead in bytes that is accounted in the interface statistics for ingress traffic.	**detail extensive**

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output
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. The value in this field also includes the Layer 2 overhead bytes for ingress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level. • **Output bytes**—Number of bytes transmitted on the interface. The value in this field also includes the Layer 2 overhead bytes for egress traffic on Ethernet interfaces if you enable accounting of Layer 2 overhead at the PIC level or the logical interface level. • **Input packets**—Number of packets received on the interface. • **Output packets**—Number of packets transmitted on the interface. Gigabit Ethernet and 10-Gigabit Ethernet IQ PICs count the overhead and CRC bytes. For Gigabit Ethernet IQ PICs, the input byte counts vary by interface type. For more information, see Table 31 under the *show interfaces (10-Gigabit Ethernet)* command.	**detail extensive**
Input errors	Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious: • **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**

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output
Output errors	Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious: • **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. NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), the **Drops** field does not always use the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs. • **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 router interfaces. • **MTU errors**—Number of packets whose size exceeded the MTU of the interface. • **Resource errors**—Sum of transmit drops.	**extensive**
Egress queues	Total number of egress queues supported on the specified interface.	**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. NOTE: Due to accounting space limitations on certain Type 3 FPCs (which are supported in M320 and T640 routers), the **Dropped packets** field does not always display the correct value for queue 6 or queue 7 for interfaces on 10-port 1-Gigabit Ethernet PICs.	**detail extensive**
Ingress queues	Total number of ingress queues supported on the specified interface. Displayed on IQ2 interfaces.	**extensive**

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output
Queue counters (Ingress)	CoS queue number and its associated user-configured forwarding class name. Displayed on IQ2 interfaces. • **Queued packets**—Number of queued packets. • **Transmitted packets**—Number of transmitted packets. • **Dropped packets**—Number of packets dropped by the ASIC's RED mechanism.	**extensive**
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. Based on the router configuration, an alarm can ring the red or yellow alarm bell on the router, or turn on the red or yellow alarm LED on the craft interface. 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
Interface transmit statistics	(On MX Series devices) Status of the **interface-transmit-statistics** configuration: Enabled or Disabled. • **Enabled**—When the **interface-transmit-statistics** statement is included in the configuration. If this is configured, the interface statistics show the actual transmitted load on the interface. • **Disabled**—When the **interface-transmit-statistics** statement is not included in the configuration. If this is not configured, the interface statistics show the offered load on the interface.	**detail extensive**
OTN FEC statistics	The forward error correction (FEC) counters provide the following statistics: • **Corrected Errors**—The count of corrected errors in the last second. • **Corrected Error Ratio**—The corrected error ratio in the last 25 seconds. For example, 1e-7 is 1 error per 10 million bits.	**detail extensive**
PCS statistics	(10-Gigabit Ethernet interfaces) Displays Physical Coding Sublayer (PCS) fault conditions from the WAN PHY or the LAN PHY device. • **Bit errors**—The number of seconds during which at least one bit error rate (BER) occurred while the PCS receiver is operating in normal mode. • **Errored blocks**—The number of seconds when at least one errored block occurred while the PCS receiver is operating in normal mode.	**detail extensive**

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output
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. For Gigabit Ethernet IQ PICs, the received octets count varies by interface type. For more information, see Table 31 under the *show interfaces (10-Gigabit Ethernet)* command. • **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. NOTE: The 20-port Gigabit Ethernet MIC (MIC-3D-20GE-SFP) does not have hardware counters for VLAN frames. Therefore, the **VLAN tagged frames** field displays 0 when the **show interfaces** command is executed on a 20-port Gigabit Ethernet MIC. In other words, the number of VLAN tagged frames cannot be determined for the 20-port Gigabit Ethernet MIC. • **Code violations**—Number of times an event caused the PHY to indicate “Data reception error” or “invalid data symbol error.”	**extensive**
OTN Received Overhead Bytes	APS/PCC0: 0x02, APS/PCC1: 0x11, APS/PCC2: 0x47, APS/PCC3: 0x58 Payload Type: 0x08	**extensive**
OTN Transmitted Overhead Bytes	APS/PCC0: 0x00, APS/PCC1: 0x00, APS/PCC2: 0x00, APS/PCC3: 0x00 Payload Type: 0x08	**extensive**

Table 9: show interfaces Gigabit Ethernet 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 router 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 router (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**
PMA PHY	(10-Gigabit Ethernet interfaces, WAN PHY mode) SONET error information: • **Seconds**—Number of seconds the defect has been active. • **Count**—Number of times that the defect has gone from inactive to active. • **State**—State of the error. Any state other than **OK** indicates a problem. Subfields are: • **PHY Lock**—Phase-locked loop • **PHY Light**—Loss of optical signal	**extensive**

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output
WIS section	(10-Gigabit Ethernet interfaces, WAN PHY mode) SONET error information: • **Seconds**—Number of seconds the defect has been active. • **Count**—Number of times that the defect has gone from inactive to active. • **State**—State of the error. Any state other than **OK** indicates a problem. Subfields are: • **BIP-B1**—Bit interleaved parity for SONET section overhead • **SEF**—Severely errored framing • **LOL**—Loss of light • **LOF**—Loss of frame • **ES-S**—Errored seconds (section) • **SES-S**—Severely errored seconds (section) • **SEFS-S**—Severely errored framing seconds (section)	**extensive**
WIS line	(10-Gigabit Ethernet interfaces, WAN PHY mode) Active alarms and defects, plus counts of specific SONET errors with detailed information: • **Seconds**—Number of seconds the defect has been active. • **Count**—Number of times that the defect has gone from inactive to active. • **State**—State of the error. Any state other than **OK** indicates a problem. Subfields are: • **BIP-B2**—Bit interleaved parity for SONET line overhead • **REI-L**—Remote error indication (near-end line) • **RDI-L**—Remote defect indication (near-end line) • **AIS-L**—Alarm indication signal (near-end line) • **BERR-SF**—Bit error rate fault (signal failure) • **BERR-SD**—Bit error rate defect (signal degradation) • **ES-L**—Errored seconds (near-end line) • **SES-L**—Severely errored seconds (near-end line) • **UAS-L**—Unavailable seconds (near-end line) • **ES-LFE**—Errored seconds (far-end line) • **SES-LFE**—Severely errored seconds (far-end line) • **UAS-LFE**—Unavailable seconds (far-end line)	**extensive**

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output
WIS path	(10-Gigabit Ethernet interfaces, WAN PHY mode) Active alarms and defects, plus counts of specific SONET errors with detailed information: • **Seconds**—Number of seconds the defect has been active. • **Count**—Number of times that the defect has gone from inactive to active. • **State**—State of the error. Any state other than **OK** indicates a problem. Subfields are: • **BIP-B3**—Bit interleaved parity for SONET section overhead • **REI-P**—Remote error indication • **LOP-P**—Loss of pointer (path) • **AIS-P**—Path alarm indication signal • **RDI-P**—Path remote defect indication • **UNEQ-P**—Path unequipped • **PLM-P**—Path payload (signal) label mismatch • **ES-P**—Errored seconds (near-end STS path) • **SES-P**—Severely errored seconds (near-end STS path) • **UAS-P**—Unavailable seconds (near-end STS path) • **SES-PFE**—Severely errored seconds (far-end STS path) • **UAS-PFE**—Unavailable seconds (far-end STS path)	**extensive**

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output

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.
	• **Link partner status**—**OK** when Ethernet interface is connected to a device that performs autonegotiation and the autonegotiation process is successful.
	• **Link partner**—Information from the remote Ethernet device:
	  • **Link mode**—Depending on the capability of the link partner, either **Full-duplex** or **Half-duplex**.
	  • **Flow control**—Types of flow control supported by the link partner. For Gigabit Ethernet interfaces, types are **Symmetric** (link partner supports **PAUSE** on receive and transmit), **Asymmetric** (link partner supports **PAUSE** on transmit), **Symmetric/Asymmetric** (link partner supports **PAUSE** on receive and transmit or only **PAUSE** on transmit), and **None** (link partner does not support flow control).
	  • **Remote fault**—Remote fault information from the link partner—**Failure** indicates a receive link error. **OK** indicates that the link partner is receiving. **Negotiation error** indicates a negotiation error. **Offline** indicates that the link partner is going offline.
	• **Local resolution**—Information from the local Ethernet device:
	  • **Flow control**—Types of flow control supported by the local device. For Gigabit Ethernet interfaces, advertised capabilities are **Symmetric/Asymmetric** (local device supports **PAUSE** on receive and transmit or only **PAUSE** on receive) and **None** (local device does not support flow control). Depending on the result of the negotiation with the link partner, local resolution flow control type will display **Symmetric** (local device supports **PAUSE** on receive and transmit), **Asymmetric** (local device supports **PAUSE** on receive), and **None** (local device does not support flow control).
	  • **Remote fault**—Remote fault information. **Link OK** (no error detected on receive), **Offline** (local interface is offline), and **Link Failure** (link error detected on receive).
		extensive

Received path trace, Transmitted path trace	(10-Gigabit Ethernet interfaces, WAN PHY mode) SONET/SDH interfaces allow path trace bytes to be sent inband across the SONET/SDH link. Juniper Networks and other router manufacturers use these bytes to help diagnose misconfigurations and network errors by setting the transmitted path trace message so that it contains the system hostname and name of the physical interface. The received path trace value is the message received from the router at the other end of the fiber. The transmitted path trace value is the message that this router transmits.	**extensive**
Packet Forwarding Engine configuration	Information about the configuration of the Packet Forwarding Engine: • **Destination slot**—FPC slot number.	**extensive**

Table 9: show interfaces Gigabit Ethernet 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**
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. Possible values are described in the "Logical Interface Flags" section under *Common Output Fields Description*.	All levels

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output
VLAN-Tag	Rewrite profile applied to incoming or outgoing frames on the outer (**Out**) VLAN tag or for both the outer and inner (**In**) VLAN tags. • **push**—An outer VLAN tag is pushed in front of the existing VLAN tag. • **pop**—The outer VLAN tag of the incoming frame is removed. • **swap**—The outer VLAN tag of the incoming frame is overwritten with the user-specified VLAN tag information. • **push**—An outer VLAN tag is pushed in front of the existing VLAN tag. • **push-push**—Two VLAN tags are pushed in from the incoming frame. • **swap-push**—The outer VLAN tag of the incoming frame is replaced by a user-specified VLAN tag value. A user-specified outer VLAN tag is pushed in front. The outer tag becomes an inner tag in the final frame. • **swap-swap**—Both the inner and the outer VLAN tags of the incoming frame are replaced by the user-specified VLAN tag value. • **pop-swap**—The outer VLAN tag of the incoming frame is removed, and the inner VLAN tag of the incoming frame is replaced by the user-specified VLAN tag value. The inner tag becomes the outer tag in the final frame. • **pop-pop**—Both the outer and inner VLAN tags of the incoming frame are removed.	**brief detail extensive** none
Demux	IP demultiplexing (demux) value that appears if this interface is used as the demux underlying interface. The output is one of the following: • Source Family Inet • Destination Family Inet	**detail extensive** none
Encapsulation	Encapsulation on the logical interface.	All levels
ACI VLAN: Dynamic Profile	Name of the dynamic profile that defines the agent circuit identifier (ACI) interface set. If configured, the ACI interface set enables the underlying Ethernet interface to create dynamic VLAN subscriber interfaces based on ACI information.	**brief detail extensive** none
Protocol	Protocol family. Possible values are described in the "Protocol Field" section under *Common Output Fields Description*.	**detail extensive** none
MTU	Maximum transmission unit size on the logical interface.	**detail extensive** none
Dynamic Profile	(MX Series routers with Trio MPCs only) Name of the dynamic profile that was used to create this interface configured with a Point-to-Point Protocol over Ethernet (PPPoE) family.	**detail extensive** none
Service Name Table	(MX Series routers with Trio MPCs only) Name of the service name table for the interface configured with a PPPoE family.	**detail extensive** none
Max Sessions	(MX Series routers with Trio MPCs only) Maximum number of PPPoE logical interfaces that can be activated on the underlying interface.	**detail extensive** none

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output
Duplicate Protection	(MX Series routers with Trio MPCs only) State of PPPoE duplicate protection: **On** or **Off**. When duplicate protection is configured for the underlying interface, a dynamic PPPoE logical interface cannot be activated when an existing active logical interface is present for the same PPPoE client.	**detail extensive** none
Direct Connect	State of the configuration to ignore DSL Forum VSAs: **On** or **Off**. When configured, the router ignores any of these VSAs received from a directly connected CPE device on the interface.	**detail extensive** none
AC Name	Name of the access concentrator.	**detail extensive** none
Maximum labels	Maximum number of MPLS labels configured for the MPLS protocol family on the logical interface.	**detail extensive** none
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**
IPv6 transit statistics	Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled.	**extensive**
Local statistics	Number and rate of bytes and packets destined to the router.	**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**
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. Possible values are described in the "Family Flags" section under *Common Output Fields Description*.	**detail extensive**
Donor interface	(Unnumbered Ethernet) Interface from which an unnumbered Ethernet interface borrows an IPv4 address.	**detail extensive** none

Table 9: show interfaces Gigabit Ethernet Output Fields *(continued)*

Field Name	Field Description	Level of Output
Preferred source address	(Unnumbered Ethernet) Secondary IPv4 address of the donor loopback interface that acts as the preferred source address for the unnumbered Ethernet interface.	**detail extensive** none
Input Filters	Names of any input filters applied to this interface. If you specify a precedence value for any filter in a dynamic profile, filter precedence values appear in parentheses next to all interfaces.	**detail extensive**
Output Filters	Names of any output filters applied to this interface. If you specify a precedence value for any filter in a dynamic profile, filter precedence values appear in parentheses next to all interfaces.	**detail extensive**
Mac-Validate Failures	Number of MAC address validation failures for packets and bytes. This field is displayed when MAC address validation is enabled for the logical interface.	**detail extensive** none
Addresses, Flags	Information about the address flags. Possible values are described in the "Addresses Flags" section under *Common Output Fields Description*.	**detail extensive** none
protocol-family	Protocol family configured on the logical interface. If the protocol is **inet**, the IP address of the interface is also displayed.	**brief**
Flags	Information about the address flag. Possible values are described in the "Addresses Flags" section under *Common Output Fields Description*.	**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**

Table 10: Gigabit Ethernet IQ PIC Traffic and MAC Statistics by Interface Type

Interface Type	Sample Command	Byte and Octet Counts Include	Comments
Inbound physical interface	**show interfaces ge-0/3/0 extensive**	Traffic statistics: Input bytes: 496 bytes per packet, representing the Layer 2 packet MAC statistics: Received octets: 500 bytes per packet, representing the Layer 2 packet + 4 bytes	The additional 4 bytes are for the CRC.
Inbound logical interface	**show interfaces ge-0/3/0.50 extensive**	Traffic statistics: Input bytes: 478 bytes per packet, representing the Layer 3 packet	

Table 10: Gigabit Ethernet IQ PIC Traffic and MAC Statistics by Interface Type *(continued)*

Interface Type	Sample Command	Byte and Octet Counts Include	Comments
Outbound physical interface	**show interfaces ge-0/0/0 extensive**	Traffic statistics: Input bytes: 490 bytes per packet, representing the Layer 3 packet + 12 bytes MAC statistics: Received octets: 478 bytes per packet, representing the Layer 3 packet	For input bytes, the additional 12 bytes include 6 bytes for the destination MAC address plus 4 bytes for VLAN plus 2 bytes for the Ethernet type.
Outbound logical interface	**show interfaces ge-0/0/0.50 extensive**	Traffic statistics: Input bytes: 478 bytes per packet, representing the Layer 3 packet	

Sample Output

show interfaces (Gigabit Ethernet)

```
user@host> show interfaces ge-3/0/2
Physical interface: ge-3/0/2, Enabled, Physical link is Up
  Interface index: 167, SNMP ifIndex: 35
  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
  CoS queues     : 4 supported, 4 maximum usable queues
  Current address: 00:05:85:4a:e9:7c, Hardware address: 00:05:85:4a:e9:7c
  Last flapped   : 2006-08-10 17:25:10 PDT (00:01:08 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  Ingress rate at Packet Forwarding Engine      : 0 bps (0 pps)
  Ingress drop rate at Packet Forwarding Engine : 0 bps (0 pps)
  Active alarms  : None
  Active defects : None

  Logical interface ge-3/0/2.0 (Index 72) (SNMP ifIndex 69)
    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
    Egress account overhead: 100
    Ingress account overhead: 90
    Input packets : 0
    Output packets: 0
    Protocol ccc, MTU: 1522
      Flags: Is-Primary
```

show interfaces (Gigabit Ethernet on MX Series Routers)

```
user@host> show interfaces ge-2/2/2
Physical interface: ge-2/2/2, Enabled, Physical link is Up
  Interface index: 156, SNMP ifIndex: 188
  Link-level type: Ethernet, MTU: 1514, Speed: 1000mbps, MAC-REWRITE Error: None,
 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
  CoS queues     : 8 supported, 4 maximum usable queues
  Schedulers     : 0
  Current address: 00:1f:12:b7:d7:c0, Hardware address: 00:1f:12:b7:d6:76
  Last flapped   : 2008-09-05 16:44:30 PDT (3d 01:04 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 0 bps (0 pps)
  Active alarms  : None
  Active defects : None
  Logical interface ge-2/2/2.0 (Index 82) (SNMP ifIndex 219)
    Flags: SNMP-Traps 0x20000000 Encapsulation: Ethernet-Bridge
    Egress account overhead: 100
    Ingress account overhead: 90
    Input packets : 0
    Output packets: 0
     Protocol aenet, AE bundle: ae0.0    Link Index: 4
```

show interfaces extensive (Gigabit Ethernet on MX Series Routers showing interface transmit statistics configuration)

```
user@host> show interfaces ge-2/1/2 extensive | match "output|interface"
Physical interface: ge-2/1/2, Enabled, Physical link is Up
  Interface index: 151, SNMP ifIndex: 530, Generation: 154
  Interface flags: SNMP-Traps Internal: 0x4000
   Output bytes  :         240614363944            772721536 bps
   Output packets:           3538446506              1420444 pps
    Direction : Output
  Interface transmit statistics: Enabled

  Logical interface ge-2/1/2.0 (Index 331) (SNMP ifIndex 955) (Generation 146)
     Output bytes  :         195560312716            522726272 bps
     Output packets:           4251311146              1420451 pps
```

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
```

show interfaces detail (Gigabit Ethernet)

```
user@host> show interfaces ge-3/0/2 detail
Physical interface: ge-3/0/2, Enabled, Physical link is Up
  Interface index: 167, SNMP ifIndex: 35, Generation: 177
  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
  CoS queues     : 4 supported, 4 maximum usable queues
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:05:85:4a:e9:7c, Hardware address: 00:05:85:4a:e9:7c
  Last flapped   : 2006-08-09 17:17:00 PDT (01:31:33 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
  Ingress traffic statistics at Packet Forwarding Engine:
   Input  bytes  :                   0                   0 bps
   Input  packets:                   0                   0 pps
   Drop   bytes  :                   0                   0 bps
   Drop   packets:                   0                   0 pps
  Ingress queues: 4 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

  Egress queues: 4 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

  Active alarms  : None
  Active defects : None

  Logical interface ge-3/0/2.0 (Index 72) (SNMP ifIndex 69) (Generation 140)
    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
    Egress account overhead: 100
    Ingress account overhead: 90
    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
   Protocol ccc, MTU: 1522, Generation: 149, Route table: 0
     Flags: Is-Primary

  Logical interface ge-3/0/2.32767 (Index 71) (SNMP ifIndex 70)
  (Generation 139)
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x0000.0 ]  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
```

show interfaces extensive (Gigabit Ethernet IQ2)

```
user@host> show interfaces ge-7/1/3 extensive
Physical interface: ge-7/1/3, Enabled, Physical link is Up
  Interface index: 170, SNMP ifIndex: 70, Generation: 171
  Link-level type: Ethernet, MTU: 1514, 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: 0x4004000
  Link flags     : None
  CoS queues     : 8 supported, 4 maximum usable queues
  Schedulers     : 256
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:14:f6:30:5e:74, Hardware address: 00:14:f6:30:5e:74
  Last flapped   : 2007-11-07 21:31:41 PST (02:03:33 ago)
  Statistics last cleared: Never
  Traffic statistics:
   Input  bytes  :          38910844056                 7952 bps
   Output bytes  :              7174605                 8464 bps
   Input  packets:            418398473                   11 pps
   Output packets:                78903                   12 pps
   IPv6 transit statistics:
    Input  bytes  :                   0
    Output bytes  :                   0
    Input  packets:                   0
    Output packets:                   0
```

```
Ingress traffic statistics at Packet Forwarding Engine:
 Input  bytes  :          38910799145                 7952 bps
 Input  packets:            418397956                   11 pps
 Drop   bytes  :                    0                    0 bps
 Drop   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: 1, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0,

  FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
Ingress queues: 4 supported, 4 in use
Queue counters:       Queued packets  Transmitted packets      Dropped packets

  0 best-effort            418390823            418390823                    0

  1 expedited-fo                   0                    0                    0

  2 assured-forw                   0                    0                    0

  3 network-cont                7133                 7133                    0

Egress queues: 4 supported, 4 in use
Queue counters:       Queued packets  Transmitted packets      Dropped packets

  0 best-effort                 1031                 1031                    0

  1 expedited-fo                   0                    0                    0

  2 assured-forw                   0                    0                    0

  3 network-cont               77872                77872                    0

Active alarms  : None
Active defects : None
MAC statistics:                      Receive         Transmit
  Total octets                    38910844056          7174605
  Total packets                     418398473            78903
  Unicast packets                408021893366             1026
  Broadcast packets                        10               12
  Multicast packets                 418398217            77865
  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  OTN Received Overhead Bytes:
  APS/PCC0: 0x02, APS/PCC1: 0x11, APS/PCC2: 0x47, APS/PCC3: 0x58
  Payload Type: 0x08
OTN Transmitted Overhead Bytes:
  APS/PCC0: 0x00, APS/PCC1: 0x00, APS/PCC2: 0x00, APS/PCC3: 0x00
  Payload Type: 0x08
Filter statistics:
  Input packet count               418398473
  Input packet rejects                   479
  Input DA rejects                       479
```

```
    Input SA rejects                          0
    Output packet count                                  78903
    Output packet pad count                                  0
    Output packet error count                                0
    CAM destination filters: 0, CAM source filters: 0
  Autonegotiation information:
    Negotiation status: Complete
    Link partner:
        Link mode: Full-duplex, Flow control: Symmetric/Asymmetric,
        Remote fault: OK
    Local resolution:
        Flow control: Symmetric, Remote fault: Link OK
  Packet Forwarding Engine configuration:
    Destination slot: 7
  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
    Direction : Input
    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

  Logical interface ge-7/1/3.0 (Index 70) (SNMP ifIndex 85) (Generation 150)
    Flags: SNMP-Traps Encapsulation: ENET2
    Traffic statistics:
     Input  bytes  :              812400
     Output bytes  :             1349206
     Input  packets:                9429
     Output packets:                9449
     IPv6 transit statistics:
      Input  bytes  :                   0
      Output bytes  :                   0
      Input  packets:                   0
      Output packets:                   0
    Local statistics:
     Input  bytes  :              812400
     Output bytes  :             1349206
     Input  packets:                9429
     Output packets:                9449
    Transit statistics:
     Input  bytes  :                   0                 7440 bps
     Output bytes  :                   0                 7888 bps
     Input  packets:                   0                   10 pps
     Output packets:                   0                   11 pps
     IPv6 transit statistics:
      Input  bytes  :                   0
      Output bytes  :                   0
      Input  packets:                   0
      Output packets:                   0
    Protocol inet, MTU: 1500, Generation: 169, Route table: 0
      Flags: Is-Primary, Mac-Validate-Strict
      Mac-Validate Failures: Packets: 0, Bytes: 0
      Addresses, Flags: Is-Preferred Is-Primary
```

```
    Input Filters: F1-ge-3/0/1.0-in, F3-ge-3/0/1.0-in
    Output Filters: F2-ge-3/0/1.0-out (53)
    Destination: 10.74.2/24, Local: 10.74.2.2, Broadcast: 10.74.2.255,
      Generation: 196
  Protocol multiservice, MTU: Unlimited, Generation: 170, Route table: 0
    Flags: Is-Primary
    Policer: Input: __default_arp_policer__
```

NOTE: For Gigabit Ethernet intelligent queuing 2 (IQ2) interfaces, the logical interface egress statistics displayed in the **show interfaces** command output 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 interface counters. For detailed information, see the description of the logical interface **Transit statistics** fields in Table 9 on page 202.

show interfaces (Gigabit Ethernet Unnumbered Interface)

```
user@host> show interfaces ge-3/2/0
Physical interface: ge-3/2/0, Enabled, Physical link is Up
  Interface index: 148, SNMP ifIndex: 50
  Link-level type: Ethernet, MTU: 1514, 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
  CoS queues     : 8 supported, 4 maximum usable queues
  Current address: 00:14:f6:11:26:f8, Hardware address: 00:14:f6:11:26:f8
  Last flapped   : 2006-10-27 04:42:23 PDT (08:01:52 ago)
  Input rate     : 0 bps (0 pps)
  Output rate    : 624 bps (1 pps)
  Active alarms  : None
  Active defects : None

  Logical interface ge-3/2/0.0 (Index 67) (SNMP ifIndex 85)
    Flags: SNMP-Traps Encapsulation: ENET2
    Input packets : 0
    Output packets: 6
    Protocol inet, MTU: 1500
      Flags: Unnumbered
      Donor interface: lo0.0 (Index 64)
      Preferred source address: 22.22.22.22
```

show interfaces (ACI Interface Set Configured)

```
user@host> show interfaces ge-1/0/0.4001
  Logical interface ge-1/0/0.4001 (Index 340) (SNMP ifIndex 548)
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.4001 ]  Encapsulation: PPP-over-

    Ethernet
    ACI VLAN:
      Dynamic Profile: aci-vlan-set-profile
    PPPoE:
      Dynamic Profile: aci-vlan-pppoe-profile,
      Service Name Table: None,
      Max Sessions: 32000, Max Sessions VSA Ignore: Off,
      Duplicate Protection: On, Short Cycle Protection: Off,
      Direct Connect: Off,
      AC Name: nbc
```



```
Input packets : 9
Output packets: 8
Protocol multiservice, MTU: Unlimited
```

show interfaces demux0 (Demux Interfaces)

Syntax

show interfaces demux0.*logical-interface-number*
<brief | detail | extensive | terse>
<descriptions>
<media>
<snmp-index *snmp-index*>
<statistics>

Release Information

Command introduced in Junos OS Release 9.0.

Description

(MX Series and M Series routers only) Display status information about the specified demux interface.

Options

none—Display standard information about the specified demux interface.

brief | detail | extensive | terse—(Optional) Display the specified level of output.

descriptions—(Optional) Display interface description strings.

media—(Optional) Display media-specific information about network interfaces.

snmp-index *snmp-index*—(Optional) Display information for the specified SNMP index of the interface.

statistics—(Optional) Display static interface statistics.

Required Privilege Level

view

Related Documentation

- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155

List of Sample Output

show interfaces (Demux) on page 230
show interfaces (PPPoE over Aggregated Ethernet) on page 231
show interfaces extensive (Targeted Distribution for Aggregated Ethernet Links) on page 232
show interfaces demux0 (ACI Interface Set Configured) on page 232

Output Fields

Table 11 on page 224 lists the output fields for the **show interfaces** (demux interfaces) command. Output fields are listed in the approximate order in which they appear.

Table 11: Demux show interfaces Output Fields

Field Name	Field Description	Level of Output
Physical Interface		
Physical interface	Name of the physical interface.	**brief detail extensive** none

Table 11: Demux show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Interface index	Index number of the physical interface, which reflects its initialization sequence.	**brief detail extensive** none
Enabled	State of the interface. Possible values are described in the "Enabled Field" section under *Common Output Fields Description*.	**brief detail extensive** none
Physical link	Status of the physical link (**Up** or **Down**).	**detail extensive** none
Admin	Administrative state of the interface (**Up** or **Down**).	**terse**
Interface index	Index number of the physical interface, which reflects its initialization sequence.	**detail extensive** none
Link	Status of the physical link (**Up** or **Down**).	**terse**
Targeting summary	Status of aggregated Ethernet links that are configured with targeted distribution (**primary** or **backup**)	**extensive**
Bandwidth	Bandwidth allocated to the aggregated Ethernet links that are configured with targeted distribution.	**extensive**
Proto	Protocol family configured on the interface.	**terse**
SNMP ifIndex	SNMP index number for the physical interface.	**detail extensive** none
Generation	Unique number for use by Juniper Networks technical support only.	**detail extensive**
Type	Type of interface. **Software-Pseudo** indicates a standard software interface with no associated hardware device.	**brief detail extensive** none
Link-level type	Encapsulation being used on the physical interface.	**brief detail extensive**
MTU	Maximum transmission unit size on the physical interface.	**brief detail extensive**
Clocking	Reference clock source: **Internal** (1) or **External** (2).	**brief detail extensive**
Speed	Speed at which the interface is running.	**brief detail extensive**
Device flags	Information about the physical device. Possible values are described in the "Device Flags" section under *Common Output Fields Description*.	**brief detail extensive** none
Interface flags	Information about the interface. Possible values are described in the "Interface Flags" section under *Common Output Fields Description*.	**brief detail extensive** none
Link type	Data transmission type.	**detail extensive** none
Link flags	Information about the link. Possible values are described in the "Link Flags" section under *Common Output Fields Description*.	**detail extensive** none

Table 11: Demux show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Physical info	Information about the physical interface.	**detail extensive**
Hold-times	Current interface hold-time up and hold-time down, in milliseconds.	**detail extensive**
Current address	Configured MAC address.	**detail extensive**
Hardware address	Hardware MAC address.	**detail extensive**
Alternate link address	Backup address of the link.	**detail extensive**
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
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. • **IPv6 transit statistics**—Number of IPv6 transit bytes and packets received and transmitted on the physical interface if IPv6 statistics tracking is enabled. NOTE: These fields include dropped traffic and exception traffic, as those fields are not separately defined. ◦ **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 11: Demux show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Input errors	Input errors on the interface whose definitions are as follows: • **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. • **Giants**—Number of frames received that are larger than the giant packet 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 the Junos OS does not handle. • **Resource errors**—Sum of transmit drops.	**extensive**
Input Rate	Input rate in bits per second (bps) and packets per second (pps).	none
Output errors	Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious: • **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. • **MTU errors**—Number of packets whose size exceeded the MTU of the interface. • **Resource errors**—Sum of transmit drops.	**extensive**
Output Rate	Output rate in bps and pps.	none
Logical Interface		
Logical interface	Name of the logical interface.	**brief detail extensive** none
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**
Flags	Information about the logical interface. Possible values are described in the "Logical Interface Flags" section under *Common Output Fields Description*.	**brief detail extensive** none
Encapsulation	Encapsulation on the logical interface.	**brief extensive** none

Table 11: Demux show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
ACI VLAN: Dynamic Profile	Name of the dynamic profile that defines the agent circuit identifier (ACI) interface set. If configured, the ACI interface set enables the underlying demux interface to create dynamic VLAN subscriber interfaces based on ACI information.	**brief detail extensive** none
Demux	Specific IP demultiplexing (demux) values: • **Underlying interface**—The underlying interface that the demux interface uses. • **Index**—Index number of the logical interface. • **Family**—Protocol family configured on the logical interface. • **Source prefixes, total**—Total number of source prefixes for the underlying interface. • **Destination prefixes, total**—Total number of destination prefixes for the underlying interface. • **Prefix—inet** family prefix.	**detail extensive** none
protocol-family	Protocol family configured on the logical interface.	**brief**
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. • **Input packets, Output packets**—Number of packets received and transmitted on the interface set. • **IPv6 transit statistics**—Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled. NOTE: The packet and byte counts in these fields include traffic that is dropped and does not leave the router. ◦ **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**
Local statistics	Number of transit bytes and packets received and transmitted on the local 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 11: Demux show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Transit statistics	Number and rate of bytes and packets transiting the switch. NOTE: The packet and byte counts in these fields include traffic that is dropped and does not leave the router. • **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**
IPv6 Transit statistics	Number of IPv6 transit bytes and packets received and transmitted on the logical interface if IPv6 statistics tracking is enabled. NOTE: The packet and byte counts in these fields include traffic that is dropped and does not leave the router. • **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**
Input packets	Number of packets received on the interface.	none
Output packets	Number of packets transmitted on the interface.	none
Protocol	Protocol family. Possible values are described in the "Protocol Field" section under *Common Output Fields Description*.	**detail extensive** none
MTU	Maximum transmission unit size on the logical interface.	**detail extensive** none
Maximum labels	Maximum number of MPLS labels configured for the MPLS protocol family 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**
Flags	Information about protocol family flags. Possible values are described in the "Family Flags" section under *Common Output Fields Description*.	**detail extensive** none
Mac-Validate Failures	Number of MAC address validation failures for packets and bytes. This field is displayed when MAC address validation is enabled for the logical interface.	**detail extensive** none
Addresses, Flags	Information about the address flags. Possible values are described in the "Addresses Flags" section under *Common Output Fields Description*.	**detail extensive** none
Destination	IP address of the remote side of the connection.	**detail extensive statistics** none

Table 11: Demux show interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Local	IP address of the logical interface.	**detail extensive terse** none
Remote	IP address of the remote interface.	**terse**
Broadcast	Broadcast address of the logical interlace.	**detail extensive** none
Generation	Unique number for use by Juniper Networks technical support only.	**detail extensive**
Link	Name of the physical interfaces for member links in an aggregated Ethernet bundle for a PPPoE over aggregated Ethernet configuration. PPPoE traffic goes out on these interfaces.	**detail extensive** none
Dynamic-profile	Name of the PPPoE dynamic profile assigned to the underlying interface.	**detail extensive** none
Service Name Table	Name of the PPPoE service name table assigned to the PPPoE underlying interface.	**detail extensive** none
Max Sessions	Maximum number of dynamic PPPoE logical interfaces that the router can activate on the underlying interface.	**detail extensive** none
Duplicate Protection	State of duplicate protection: **On** or **Off**. Duplicate protection prevents the activation of another dynamic PPPoE logical interface on the same underlying interface when a dynamic PPPoE logical interface for a client with the same MAC address is already active on that interface.	**detail extensive** none
Direct Connect	State of the configuration to ignore DSL Forum VSAs: **On** or **Off**. When configured, the router ignores any of these VSAs received from a directly connected CPE device on the interface.	**detail extensive** none
AC Name	Name of the access concentrator.	**detail extensive** none

Sample Output

show interfaces (Demux)

```
user@host> show interfaces demux0
Physical interface: demux0, Enabled, Physical link is Up
  Interface index: 128, SNMP ifIndex: 79, Generation: 129
  Type: Software-Pseudo, Link-level type: Unspecified, MTU: 9192, Clocking: 1,
  Speed: Unspecified
  Device flags   : Present Running
  Interface flags: Point-To-Point SNMP-Traps
  Link type      : Full-Duplex
  Link flags     : None
  Physical info  : Unspecified
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: Unspecified, Hardware address: Unspecified
  Alternate link address: Unspecified
  Last flapped   : Never
  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
   IPv6 transit statistics:
    Input  bytes  :                   0
    Output bytes  :                   0
    Input  packets:                   0
    Output packets:                   0
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Giants: 0,
    Policed discards: 0, Resource errors: 0
  Output errors:
    Carrier transitions: 0, Errors: 0, Drops: 0, MTU errors: 0,
    Resource errors: 0

Logical interface demux0.0 (Index 87) (SNMP ifIndex 84) (Generation 312)
    Flags: SNMP-Traps 0x4000 Encapsulation: ENET2
    Demux:
     Underlying interface: ge-2/0/1.0 (Index 74)
   Family Inet Source prefixes, total 1
   Prefix: 1.1.1/24
    Traffic statistics:
     Input  bytes  :                   0
     Output bytes  :                1554
     Input  packets:                   0
     Output packets:                  37
     IPv6 transit statistics:
      Input  bytes  :                  0
      Output bytes  :                  0
      Input  packets:                  0
      Output packets:                  0
    Local statistics:
     Input  bytes  :                   0
     Output bytes  :                1554
     Input  packets:                   0
     Output packets:                  37
    Transit statistics:
     Input  bytes  :                   0                    0 bps
     Output bytes  :                   0                    0 bps
     Input  packets:                   0                    0 pps
     Output packets:                   0                    0 pps
     IPv6 transit statistics:
      Input  bytes  :                  0
      Output bytes  :                  0
      Input  packets:                  0
      Output packets:                  0
    Protocol inet, MTU: 1500, Generation: 395, Route table: 0
      Flags: Is-Primary, Mac-Validate-Strict
      Mac-Validate Failures: Packets: 0, Bytes: 0
      Addresses, Flags: Is-Preferred Is-Primary
        Destination: 11.1.1/24, Local: 11.1.1.1, Broadcast: 11.1.1.255,
        Generation: 434
```

show interfaces (PPPoE over Aggregated Ethernet)

```
user@host> show interfaces demux0.100
Logical interface demux0.100 (Index 76) (SNMP ifIndex 61160)
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.100 ]
    Encapsulation: ENET2
```

```
    Demux:
      Underlying interface: ae0 (Index 199)
    Link:
      ge-1/0/0
      ge-1/1/0
    Input packets : 0
    Output packets: 0
    Protocol pppoe
      Dynamic Profile: pppoe-profile,
      Service Name Table: service-table1,
      Max Sessions: 100, Duplicate Protection: On,
      Direct Connect: Off,
      AC Name: pppoe-server-1
```

show interfaces extensive (Targeted Distribution for Aggregated Ethernet Links)

```
user@host> show interfaces demux0.1073741824 extensive

  Logical interface demux0.1073741824 (Index 75) (SNMP ifIndex 558) (Generation
346)
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.1 ]  Encapsulation: ENET2
    Demux:
      Underlying interface: ae0 (Index 201)
    Link:
      ge-1/0/0
      ge-1/1/0
      ge-2/0/7
      ge-2/0/8
    Targeting summary:
      ge-1/1/0, primary, Physical link is Up
      ge-2/0/8, backup, Physical link is Up
    Bandwidth: 1000mbps
```

show interfaces demux0 (ACI Interface Set Configured)

```
user@host> show interfaces demux0.1073741827
  Logical interface demux0.1073741827 (Index 346) (SNMP ifIndex 527)
    Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.1802 0x8100.302 ]  Encapsulation:
 ENET2
    Demux: Source Family Inet
    ACI VLAN:
      Dynamic Profile: aci-vlan-set-profile
    Demux:
      Underlying interface: ge-1/0/0 (Index 138)
    Input packets : 18
    Output packets: 16
    Protocol inet, MTU: 1500
      Flags: Sendbcast-pkt-to-re, Unnumbered
      Donor interface: lo0.0 (Index 322)
      Preferred source address: 100.20.200.202
      Addresses, Flags: Primary Is-Default Is-Primary
        Local: 10.4.12.119
    Protocol pppoe
      Dynamic Profile: aci-vlan-pppoe-profile,
      Service Name Table: None,
      Max Sessions: 32000, Max Sessions VSA Ignore: Off,
      Duplicate Protection: On, Short Cycle Protection: Off,
      Direct Connect: Off,
      AC Name: nbc
```

show interfaces interface-set (Ethernet Interface Set)

Syntax show interfaces interface-set *interface-set-name*
<detail | terse>

Release Information Command introduced in Junos OS Release 8.5.

Description Display information about the specified gigabit or 10-Gigabit Ethernet interface set. Supported in MX Series routers with enhanced queuing DPCs or MPCs.

You can also use the **show interfaces interface-set** command to display information about agent circuit identifier (ACI) interface sets configured on MX Series routers with MPCs/MICs.

Options **interface-set** *interface-set-name*—Display information about the specified Gigabit Ethernet, 10-Gigabit Ethernet, or ACI interface set.

detail | terse—(Optional) Display the specified level of output.

Required Privilege Level view

Related Documentation
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155

List of Sample Output
show interfaces interface-set terse on page 234
show interfaces interface-set detail on page 234
show interfaces interface-set (ACI Interface Set) on page 235

Output Fields Table 12 on page 233 describes the information for the **show interfaces interface-set** command.

Table 12: Ethernet show interfaces interface-set Output Fields

Field Name	Field Description	Level of Output
Physical Interface		
Interface set	Name of the interface set or sets.	All levels
Interface set index	Index number of the interface set. For ACI interface sets, the following fields are displayed: • **ACI VLAN**—ACI interface set that the router uses to create dynamic VLAN subscriber interfaces based on the agent circuit identifier value. • **PPPoE**—Dynamic PPPoE subscriber interface that the router creates using the ACI interface set.	**detail** none
Agent Circuit ID	For ACI interface sets, string in DHCP or PPPoE control packets that uniquely identifies the subscriber's access node and and the DSL line on the access node.	**detail** none
Max Sessions	For dynamic PPPoE subscriber interfaces, maximum number of PPPoE logical interfaces that that can be activated on the underlying interface.	**detail** none

Table 12: Ethernet show interfaces interface-set Output Fields *(continued)*

Field Name	Field Description	Level of Output
Max Sessions VSA Ignore	For dynamic PPPoE subscriber interfaces, whether the router is configured to ignore (clear) the PPPoE maximum session value returned by RADIUS in the Max-Clients-Per-Interface Juniper Networks VSA [26-143] and restore the PPPoE maximum session value on the underlying interface to the value configured with the **max-sessions** statement: **Off** (default) or **On**.	**detail** none
Traffic statistics	Number and rate of bytes and packets received and transmitted on the specified interface set. • **Input bytes, Output bytes**—Number of bytes and number of bytes per second received and transmitted on the interface set • **Input packets, Output packets**—Number of packets and number of packets per second received and transmitted on the interface set.	**detail**
Egress queues supported	Total number of egress queues supported on the specified interface set.	**detail**
Egress queues in use	Total number of egress queues used on the specified interface set.	**detail**
Queue counters	**Queued packets**, **Transmitted packets**, and **Dropped packets** statistics for the four forwarding classes.	**detail**
Members	List of all interface sets or, for ACI interface sets, list of all subscriber interfaces belonging to the specified ACI interface set.	**detail** none

Sample Output

show interfaces interface-set terse

```
user@host> show interfaces interface-set terse
Interface set:
   iflset-xe-11/3/0-0
   ge-1/0/1-0
   ge-1/0/1-2
```

show interfaces interface-set detail

```
user@host> show interfaces interface-set iflset-xe-11/3/0-0 detail
Interface set: iflset-xe-11/3/0-0
  Interface set index: 19
  Traffic statistics:
   Output bytes  :            751017840            401673504 bps
   Output packets:             11044380               738377 pps
  Egress queues: 4 supported, 4 in use
  Queue counters:       Queued packets  Transmitted packets    Dropped packets
    0 best-effort            211091327             11044380          199995746
    1 expedited-fo                  0                    0                  0
    2 assured-forw                  0                    0                  0
    3 network-cont                  0                    0                  0
  Members:
   xe-11/3/0.0
```

show interfaces interface-set (ACI Interface Set)

```
user@host> show interfaces interface-set
Interface set: aci-1001-demux0.1073741826
  Interface set index: 1
    ACI VLAN:
      Agent Circuit ID: aci-ppp-dhcp-dvlan-60
    PPPoE:
      Max Sessions: 3, Max Sessions VSA Ignore: Off
  Members:
   pp0.1073741827
```

show pppoe interfaces

Syntax
show pppoe interfaces
<brief | detail | extensive>
<pp0.*logical*>

Release Information
Command introduced before Junos OS Release 7.4.

Description
(J Series Services Routers, M120 routers, M320 routers, and MX Series routers only) Display session-specific information about PPPoE interfaces.

Options
none—Display interface information for all PPPoE interfaces.

brief | detail—(Optional) Display the specified level of output.

extensive—(J Series Services Routers) (Optional) Display information about the number of packets sent and received and the number of timeouts during a PPPoE session.

pp0.*logical*—(Optional) Name of an interface. The logical unit number for static interfaces can be a value from 0 through 16385. The logical unit number for dynamic interfaces can be a value from 1073741824 through the maximum number of logical interfaces supported on your router.

Required Privilege Level
view

Related Documentation
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155

List of Sample Output
show pppoe interfaces on page 238
show pppoe interfaces (Status for the Specified Interface) on page 238
show pppoe interfaces brief on page 239
show pppoe interfaces detail on page 239
show pppoe interfaces extensive (J Series Services Routers only) on page 239
show pppoe interfaces (PPPoE Subscriber Interface with ACI Interface Set) on page 239

Output Fields
Table 13 on page 236 lists the output fields for the **show pppoe interfaces** command. Output fields are listed in the approximate order in which they appear. Not all fields are displayed for PPPoE interfaces on M120 and M320 routers in server mode.

Table 13: show pppoe interfaces Output Fields

Field Name	Field Description	Level of Output
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
State	State of the logical interface: **up** or **down**.	All levels

Table 13: show pppoe interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Session ID	Session ID.	All levels
Type	Origin of the logical interface: **Static** or **Dynamic**. Indicates whether the interface was statically or dynamically created.	**detail extensive** none
Service name	Type of service required (can be used to indicate an ISP name or a class or quality of service).	**detail extensive** none
Configured AC name	Configured access concentrator name.	**detail extensive** none
Session AC name	Name of the access concentrator.	**detail extensive** none
Remote MAC address or **Remote MAC**	MAC address of the remote side of the connection, either the access concentrator or the PPPoE client.	All levels
Auto-reconnect timeout	(J Series Services Routers only) Time after which to try to reconnect after a PPPoE session is terminated, in seconds.	**detail extensive** none
Idle timeout	(J Series Services Routers only) Length of time (in seconds) that a connection can be idle before disconnecting.	**detail extensive** none
Session uptime	Length of time the session has been up, in *hh:mm:ss*.	**detail extensive** none
Dynamic Profile	Name of the dynamic profile that was used to create this interface. If the interface was statically created, this field is not displayed.	**detail extensive** none
Underlying interface	Interface on which PPPoE is running.	All levels
Agent Circuit ID	Agent circuit identifier (ACI) that corresponds to the DSLAM interface that initiated the client service request. An asterisk is interpreted as a wildcard character and can appear at the beginning, the end, or both the beginning and end of the string. If the agent circuit ID is not configured, this field is not displayed.	**detail extensive** none
Agent Remote ID	Agent remote identifier that corresponds to the subscriber associated with the DSLAM interface that initiated the service request. An asterisk is interpreted as a wildcard character and can appear at the beginning, the end, or both at the beginning and end of the string. If the agent remote ID is not configured, this field is not displayed.	**detail extensive** none
ACI Interface Set	Internally-generated name of the dynamic ACI interface set, if configured, and the set index number of the ACI entry in the session database.	**detail extensive** none

Table 13: show pppoe interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Packet Type	Number of packets sent and received during the PPPoE session, categorized by packet type and packet errors: • **PADI**—PPPoE Active Discovery Initiation packets. • **PADO**—PPPoE Active Discovery Offer packets. • **PADR**—PPPoE Active Discovery Request packets. • **PADS**—PPPoE Active Discovery Session-Confirmation packets. • **PADT**—PPPoE Active Discovery Termination packets. • **Service name error**—Packets for which the Service-Name request could not be honored. • **AC system error**—Packets for which the access concentrator experienced an error in performing the host request. For example, the host had insufficient resources to create a virtual circuit. • **Generic error**—Packets that indicate an unrecoverable error occurred. • **Malformed packets**—Malformed or short packets that caused the packet handler to discard the frame as unreadable. • **Unknown packets**—Unrecognized packets.	**extensive**
Timeout	(J Series Services Routers only) Information about timeouts that occurred during the PPPoE session: • **PADI**—No PADO packet has been received within the timeout period. • **PADO**—No PADR packet has been received within the timeout period. (This value is always zero and is not supported.) • **PADR**—No PADS packet has been received within the timeout period.	**extensive**

Sample Output

show pppoe interfaces

```
user@host> show pppoe interfaces
pp0.0 Index 66
  State: Down, Session ID: None,
  Service name: None, Configured AC name: sapphire,
  Session AC name: None, Remote MAC address: 00:00:00:00:00:00,
  Auto-reconnect timeout: 100 seconds, Idle timeout: Never,
  Underlying interface: at-5/0/0.0 Index 71
```

show pppoe interfaces (Status for the Specified Interface)

```
user@host> show pppoe interfaces pp0.1073741827
pp0.1073741827 Index 70
  State: Session Up, Session ID: 30, Type: Dynamic,
  Session AC name: velorum,
  Remote MAC address: 00:90:1A:42:0A:C1,
  Session uptime: 16:45:46 ago,
  Underlying interface: ge-2/0/3.1 Index 73
  Service name: premium
  Dynamic Profile: PppoeProfile
  Agent Circuit ID: velorum-ge-2/0/3
  Agent Remote ID: westford
```

show pppoe interfaces brief

```
user@host> show pppoe interfaces brief
Interface       Underlying            State       Session    Remote
                interface                         ID         MAC
pp0.0           ge-2/0/3.2            Session Up  27         00:90:1A:42:0A:C1
pp0.1           ge-2/0/3.2            Session Up  28         00:90:1A:42:0A:C1
pp0.1073741824  ge-2/0/3.1            Session Up  29         00:90:1A:42:0A:C1
pp0.1073741825  ge-2/0/3.1            Session Up  30         00:90:1A:42:0A:C1
pp0.1073741826  ge-2/0/3.1            Session Up  31         00:90:1A:42:0A:C1
```

show pppoe interfaces detail

```
user@host> show pppoe interfaces detail
pp0.0 Index 66
  State: Down, Session ID: None, Type: Static,
  Service name: None, Configured AC name: sapphire,
  Session AC name: None, Remote MAC address: 00:00:00:00:00:00,
  Auto-reconnect timeout: 100 seconds, Idle timeout: Never,
  Underlying interface: at-5/0/0.0 Index 71
```

show pppoe interfaces extensive (J Series Services Routers only)

```
user@host> show pppoe interfaces pp0.1 extensive
pp0.1 Index 66
  State: Down, Session ID: 26, Type: Static,
  Service name: None, Configured AC name: sapphire,
  Session AC name: None, Remote MAC address: 00:00:00:00:00:00,
  Auto-reconnect timeout: 100 seconds, Idle timeout: Never,
  Underlying interface: ge-3/0/3.1 Index 71
  PacketType                      Sent         Received
    PADI                             0                0
    PADO                             0                0
    PADR                             0                6
    PADS                             6                0
    PADT                             6                0
    Service name error               0                0
    AC system error                  0                0
    Generic error                    0                0
    Malformed packets                0                0
    Unknown packets                  0                0
  Timeout
    PADI                             0
    PADO                             0
    PADR                             0
```

show pppoe interfaces (PPPoE Subscriber Interface with ACI Interface Set)

```
user@host> show pppoe interfaces pp0.1073741827
pp0.1073741827 Index 346
  State: Session Up, Session ID: 4, Type: Dynamic,
  Service name: AGILENT, Remote MAC address: 00:00:64:39:01:02,
  Session AC name: nbc,
  Session uptime: 6d 02:22 ago,
  Dynamic Profile: aci-vlan-pppoe-profile,
  Underlying interface: demux0.1073741826 Index 345
  Agent Circuit ID: aci-ppp-dhcp-dvlan-50
  ACI Interface Set: aci-1002-demux0.1073741826 Index 2
```

show pppoe underlying-interfaces

Syntax
show pppoe underlying-interfaces
<brief | detail | extensive>
<lockout>
<*logical-interface-name*>

Release Information
Command introduced in Junos OS Release 10.0.
lockout option added in Junos OS Release 11.4.

Description
(M120, M320, and MX Series routers only) Display information about PPPoE underlying interfaces.

Options
brief | detail | extensive—(Optional) Display the specified level of output.

lockout—(Optional) Display summary information about the lockout condition and the lockout grace period for PPPoE clients on the PPPoE underlying interface.

logical-interface-name—(Optional) Name of a PPPoE underlying logical interface.

Required Privilege Level
view

Related Documentation
- *Verifying and Managing Dynamic PPPoE Configuration*
- *Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces*
- *Configuring the PPPoE Family for an Underlying Interface*
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155

List of Sample Output
show pppoe underlying-interfaces brief on page 243
show pppoe underlying-interfaces detail on page 243
show pppoe underlying-interfaces extensive on page 243
show pppoe underlying-interfaces extensive (PPPoE client in lockout condition) on page 244
show pppoe underlying-interfaces lockout on page 244
show pppoe underlying-interfaces detail (Autosensing Configured for ACI-based Dynamic VLANs) on page 245

Output Fields
Table 14 on page 240 lists the output fields for the **show pppoe underlying-interfaces** command. Output fields are listed in the approximate order in which they appear.

Table 14: show pppoe underlying-interfaces Output Fields

Field Name	Field Description	Level of Output
Underlying Interface	Name of the PPPoE underlying logical interface.	All levels

Table 14: show pppoe underlying-interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Service Name Table	Name of the service name table.	All levels
Dynamic Profile	Name of the dynamic profile that was used to create this interface. If the interface was statically created, then the value is **none**.	All levels
Index	Index number of the logical interface, which reflects its initialization sequence.	**detail extensive**
State	Origin of the logical interface: **Static** or **Dynamic**. Indicates whether the interface was statically or dynamically created.	**detail extensive**
Operational States	Fields in this block are actual operational values rather than simply the configured values. The operational values can be the result of RADIUS-initiated changes.	**detail extensive**
Max Sessions	Maximum number of PPPoE logical interfaces that can be activated on the underlying interface. When this number of logical interfaces has been established, all subsequent PPPoE Active Discovery Initiation (PADI) packets are dropped and all subsequent PPPoE Active Discovery Request (PADR) packets trigger PPPoE Active Discovery Session (PADS) error responses.	**detail extensive**
Max Sessions VSA Ignore	Whether the router is configured to ignore (clear) the PPPoE maximum session value returned by RADIUS in the Max-Clients-Per-Interface Juniper Networks VSA [26-143] and restore the PPPoE maximum session value on the underlying interface to the value configure with the **max-sessions** statement: **Off** (default) or **On**.	**detail extensive** none
Active Sessions	Number of active PPPoE sessions on the underlying interface. If a dynamic profile is listed, then it is the number of active PPPoE sessions on the underlying interface that are using this profile. The Active Sessions value must not exceed the Max Sessions value.	**detail extensive**
Agent Circuit Identifier	Whether the underlying interface is configured to enable creation of (autosense) dynamic VLAN subscriber interfaces based on agent circuit identifier (ACI) information. **Autosensing** indicates that creation of ACI-based dynamic VLAN interfaces is enabled on the underlying interface. If creation of ACI-based dynamic VLANs is not configured on the underlying interface, this field does not appear.	**detail extensive** none
Duplicate Protection	State of PPPoE duplicate protection: **On** or **Off**. When duplicate protection is configured for the underlying interface, a dynamic PPPoE logical interface cannot be activated when an existing active logical interface is present for the same PPPoE client. The uniqueness of the PPPoE client is determined by the client's MAC address.	**detail extensive**
Short Cycle Protection	State of PPPoE short cycle protection: **mac-address**, **circuit-id**, or **Off**. Enabling short cycle protection, also known as PPPoE lockout, on the PPPoE underlying interface temporarily prevents (locks out) a failed or short-lived (short-cycle) PPPoE subscriber session from reconnecting to the router for a default or configurable period of time. PPPoE client sessions are identified by their unique media access control (MAC) source address.	**detail extensive**

Table 14: show pppoe underlying-interfaces Output Fields *(continued)*

Field Name	Field Description	Level of Output
Direct Connect	State of the configuration to ignore DSL Forum VSAs: **On** or **Off**. When configured, the router ignores any of these VSAs received from a directly connected CPE device on the interface.	**detail extensive** none
AC Name	Name of the access concentrator.	**detail extensive**
PacketType	Number of packets sent and received during the PPPoE session, categorized by packet type and packet errors: • **PADI**—PPPoE Active Discovery Initiation packets. • **PADO**—PPPoE Active Discovery Offer packets. • **PADR**—PPPoE Active Discovery Request packets. • **PADS**—PPPoE Active Discovery Session-Confirmation packets. • **PADT**—PPPoE Active Discovery Termination packets. • **Service name error**—Packets for which the Service-Name request could not be honored. • **AC system error**—Packets for which the access concentrator experienced an error in performing the host request. For example, the host had insufficient resources to create a virtual circuit. • **Generic error**—Packets that indicate an unrecoverable error occurred. • **Malformed packets**—Malformed or short packets that caused the packet handler to discard the frame as unreadable. • **Unknown packets**—Unrecognized packets.	**extensive**
Lockout Time (sec)	The PPPoE lockout time range, the number of PPPoE clients in lockout condition, and the number of PPPoE clients in a lockout grace period if **Short Cycle Protection** is enabled (**On**): • **Min**—Minimum lockout time, in seconds, configured on the PPPoE underlying interface. • **Max**—Maximum lockout time, in seconds, configured on the PPPoE underlying interface. • **Total clients in lockout**—Number of PPPoE clients currently undergoing lockout. • **Total clients in lockout grace period**—Number of PPPoE clients currently in a lockout grace period. A *lockout grace period* occurs when the time between lockout events is greater than either 15 minutes or the maximum lockout time.	**extensive**
Client Address	MAC source address of the PPPoE client.	**extensive**
Current	Current lockout time, in seconds; displays **0** (zero) if the PPPoE client is not undergoing lockout.	**extensive**
Elapsed	Time elapsed into the lockout period, in seconds; displays **0**zero) if the PPPoE client is not undergoing lockout	**extensive**
Next	Lockout time, in seconds, that the router uses for the next lockout event; displays a nonzero value if the PPPoE client is currently in a lockout grace period.	**extensive**

Sample Output

show pppoe underlying-interfaces brief

```
user@host> show pppoe underlying-interfaces brief
Underlying Interface    Service Name Table    Dynamic Profile
ge-4/0/3.1              Premium               None
ge-4/0/3.2              None                  PppoeProfile
```

show pppoe underlying-interfaces detail

```
user@host> show pppoe underlying-interfaces detail
ge-4/0/3.1 Index 73
  Operational States:
  State: Static, Dynamic Profile: None,
  Max Sessions: 4000, Max Sessions VSA Ignore: Off,
  Active Sessions: 0,
  Service Name Table: Premium,
  Direct Connect: Off,
  AC Name: velorum, Duplicate Protection: On,
  Short Cycle Protection: Off

ge-4/0/3.2 Index 78
  Operational States:
  State: Dynamic, Dynamic Profile: PppoeProfile,
  Max Sessions: 500, Max Sessions VSA Ignore: Off,
  Active Sessions: 3,
  Service Name Table: None,
  Direct Connect: Off,
  AC Name: velorum, Duplicate Protection: On,
  Short Cycle Protection: Off
```

show pppoe underlying-interfaces extensive

```
user@host> show pppoe underlying-interfaces extensive
ge-4/0/3.1 Index 73
  Operational States:
  State: Static, Dynamic Profile: None,
  Max Sessions: 4000, Max Sessions VSA Ignore Off,
  Active Sessions: 0,
  Service Name Table: None,
  Direct Connect: Off,
  AC Name: velorum, Duplicate Protection: Off,
  Short Cycle Protection: Off

  PacketType                        Sent         Received

    PADI                               0                0
    PADO                               0                0
    PADR                               0                0
    PADS                               0                0
    PADT                               0                0
    Service name error                 0                0
    AC system error                    0                0
    Generic error                      0                0
    Malformed packets                  0                0
    Unknown packets                    0                0

ge-4/0/3.2 Index 78
  Operational States:
```

```
  State: Dynamic, Dynamic Profile: PppoeProfile,
  Max Sessions: 4000, Max Sessions VSA Ignore: Off
  Active Sessions: 3,
  Service Name Table: None,
  Direct Connect: Off,
  AC Name: velorum, Duplicate Protection: Off,
  Short Cycle Protection: Off

  PacketType                       Sent         Received
    PADI                              0                5
    PADO                              5                0
    PADR                              0                5
    PADS                              4                0
    PADT                              0                1
    Service name error                0                0
    AC system error                   0                0
    Generic error                     0                0
    Malformed packets                 0                0
    Unknown packets                   0                0
```

show pppoe underlying-interfaces extensive (PPPoE client in lockout condition)

```
user@host> show pppoe underlying-interfaces ge-1/0/0/.0 extensive
ge-1/0/0.0 Index 71
  State: Static, Dynamic Profile: None,
  Max Sessions: 32000, Max Sessions VSA Ignore: Off,
  Active Sessions: 0,
  Service Name Table: None,
  Direct Connect: Off,
  AC name: winona, Duplicate Protection: On,
  Short Cycle Protection: Off

  PacketType                       Sent         Received
    PADI                              0                7
    PADO                              3                0
    PADR                              0                3
    PADS                              3                0
    PADT                              2                1
    Service name error                0                0
    AC system error                   0                0
    Generic error                     0                0
    Malformed packets                 0                0
    Unknown packets                   0                0

  Lockout Time (sec):  Min: 1, Max: 30
    Total clients in lockout: 1
    Total clients in lockout grace period: 0

  Client Address             Current     Elapsed    Next
    00:10:94:00:00:01              4           3       8
```

show pppoe underlying-interfaces lockout

```
user@host> show pppoe underlying-interfaces ge-1/0/0.0 lockout
ge-1/0/0.0 Index 71
  Short Cycle Protection: Off,
  Lockout Time (sec):  Min: 10, Max: 60
    Total clients in lockout: 0
    Total clients in lockout grace period: 0
```

show pppoe underlying-interfaces detail (Autosensing Configured for ACI-based Dynamic VLANs)

```
user@host> show pppoe underlying-interfaces demux0.1073741826 detail
demux0.1073741826 Index 345
  State: Dynamic, Dynamic Profile: aci-vlan-pppoe-profile,
  Max Sessions: 32000, Max Sessions VSA Ignore: Off,
  Active Sessions: 1,
  Agent Circuit Identifier: Autosensing,
  Service Name Table: None,
  Duplicate Protection: On, Short Cycle Protection: Off,
  Direct Connect: Off,
  AC Name: nbc,
  Short Cycle Protection Level: circuit-id,
```

show subscribers

Syntax

show subscribers
<detail | extensive | terse>
<aci-interface-set-name *aci-interface-set-name*>
<address *address*>
<agent-circuit-identifier *agent-circuit-identifier-substring*>
<client-type *client-type*>
<count>
<id>
<interface *interface*>
<logical-system *logical-system*>
<mac-address *mac-address*>
<physical-interface *physical-interface-name*>
<profile-name *profile-name*>
<routing-instance *routing-instance*>
<stacked-vlan-id *stacked-vlan-id*>
<subscriber-state *subscriber-state*>
<user-name *user-name*>
<vci *vci-identifier*>
<vpi *vpi-identifier*>
<vlan-id *vlan-id*>

Release Information

Command introduced in Junos OS Release 9.3.
Command introduced in Junos OS Release 9.3 for EX Series switches.
client-type, **mac-address**, **subscriber-state**, and **extensive** options introduced in Junos OS Release 10.2.
count option usage with other options introduced in Junos OS Release 10.2.
Command introduced in Junos OS Release 11.1 for the QFX Series.
Options **aci-interface-set-name** and **agent-circuit-identifier** introduced in Junos OS Release 12.2.
The **physical-interface** and **user-name** options introduced in Junos OS Release 12.3.
Options **vci** and **vpi** introduced in Junos OS Release 12.3R3 and supported in later 12.3R*x* releases.
Options **vci** and **vpi** supported in Junos OS Release 13.2 and later releases. (Not supported in Junos OS Release 13.1.)

Description

Display information for active subscribers.

Options

detail | extensive | terse—(Optional) Display the specified level of output.

aci-interface-set-name—(Optional) Display all dynamic subscriber sessions that use the specified agent circuit identifier (ACI) interface set. Use the ACI interface set name generated by the router, such as aci-1003-ge-1/0/0.4001, and not the actual ACI value found in the DHCP or PPPoE control packets.

address—(Optional) Display subscribers whose IP address matches the specified address. You must specify the IPv4 or IPv6 address prefix without a netmask (for example, 192.168.17.1). If you specify the IP address as a prefix with a netmask (for example, 192.168.17.1/32), the router displays a message that the IP address is invalid, and rejects the command.

agent-circuit-identifier-substring—(Optional) Display all dynamic subscriber sessions whose ACI value matches the specified substring.

client-type—(Optional) Display subscribers whose client type matches the specified client type (DHCP, L2TP, PPP, PPPOE, VLAN, or static).

count—(Optional) Display the count of total subscribers and active subscribers for any specified option. You can use the **count** option alone or with the **address**, **client-type**, **interface**, **logical-system**, **mac-address**, **profile-name**, **routing-instance**, **stacked-vlan-id**, **subscriber-state**, or **vlan-id** options.

id—(Optional) Display a specific subscriber session whose session id matches the specified subscriber ID. You can display subscriber IDs by using the **show subscribers extensive** or the **show subscribers interface extensive** commands.

interface—(Optional) Display subscribers whose interface matches the specified interface.

logical-system—(Optional) Display subscribers whose logical system matches the specified logical system.

mac-address—(Optional) Display subscribers whose MAC address matches the specified MAC address.

physical-interface-name—(M120, M320, and MX Series routers only) (Optional) Display subscribers whose physical interface matches the specified physical interface.

profile-name—(Optional) Display subscribers whose dynamic profile matches the specified profile name.

routing-instance—(Optional) Display subscribers whose routing instance matches the specified routing instance.

stacked-vlan-id—(Optional) Display subscribers whose stacked VLAN ID matches the specified stacked VLAN ID.

subscriber-state—(Optional) Display subscribers whose subscriber state matches the specified subscriber state (ACTIVE, CONFIGURED, INIT, TERMINATED, or TERMINATING).

user-name—(M120, M320, and MX Series routers only) (Optional) Display subscribers whose username matches the specified subscriber name.

vci-identifier—(MX Series routers with MPCs and ATM MICs with SFP only) (Optional) Display active ATM subscribers whose ATM virtual circuit identifier (VCI) matches the specified VCI identifier. The range of values is **0** through **255**.

vpi-identifier—(MX Series routers with MPCs and ATM MICs with SFP only) (Optional) Display active ATM subscribers whose ATM virtual path identifier (VPI) matches the specified VPI identifier. The range of values is **0** through **65535**.

vlan-id—(Optional) Display subscribers whose VLAN ID matches the specified VLAN ID.

NOTE: Due to display limitations, logical system and routing instance output values are truncated when necessary.

Required Privilege Level view

Related Documentation

- show subscribers summary on page 264
- Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration on page 155

List of Sample Output

show subscribers (IPv4) on page 252
show subscribers (IPv6) on page 252
show subscribers (IPv4 and IPv6 Dual Stack) on page 252
show subscribers (LNS on MX Series Routers) on page 253
show subscribers (L2TP Switched Tunnels) on page 253
show subscribers client-type dhcp detail on page 253
show subscribers count on page 253
show subscribers address detail (IPv6) on page 253
show subscribers detail (IPv4) on page 254
show subscribers detail (IPv6) on page 254
show subscribers detail (IPv6 Static Demux Interface) on page 255
show subscribers detail (L2TP LNS Subscribers on MX Series Routers) on page 255
show subscribers detail (L2TP Switched Tunnels) on page 255
show subscribers detail (Tunneled Subscriber) on page 256
show subscribers detail (IPv4 and IPv6 Dual Stack) on page 256
show subscribers detail (ACI Interface Set Session) on page 257
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show subscribers extensive (Effective Shaping-Rate) on page 259
show subscribers aci-interface-set-name detail (Subscriber Sessions Using Specified ACI Interface Set) on page 260
show subscribers agent-circuit-identifier detail (Subscriber Sessions Using Specified ACI Substring) on page 260
show subscribers interface extensive on page 261
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show subscribers user-name detail on page 262

show subscribers vlan-id on page 263
show subscribers vlan-id detail on page 263
show subscribers vpi vci extensive (PPPoE-over-ATM Subscriber Session) on page 263

Output Fields Table 15 on page 249 lists the output fields for the **show subscribers** command. Output fields are listed in the approximate order in which they appear.

Table 15: show subscribers Output Fields

Field Name	Field Description
Interface	Interface associated with the subscriber. The router or switch displays subscribers whose interface matches or begins with the specified interface. The * character indicates a continuation of addresses for the same session.
IP Address/VLAN ID	Subscriber IP address or VLAN ID associated with the subscriber in the form *tpid.vlan-id* No IP address or VLAN ID is assigned to an L2TP tunnel-switched session. For these subscriber sessions the value is **Tunnel-switched**.
User Name	Name of subscriber.
LS:RI	Logical system and routing instance associated with the subscriber.
Type	Subscriber client type (DHCP, L2TP, PPP, PPPoE, STATIC-INTERFACE, VLAN).
IP Address	Subscriber IPv4 address.
IP Netmask	Subscriber IP netmask.
Primary DNS Address	IP address of primary DNS server.
Secondary DNS Address	IP address of secondary DNS server.
Primary WINS Address	IP address of primary WINS server.
Secondary WINS Address	IP address of secondary WINS server.
IPv6 Address	Subscriber IPv6 address, or multiple addresses.
IPv6 Prefix	Subscriber IPv6 prefix. If you are using DHCPv6 prefix delegation, this is the delegated prefix.
IPv6 User Prefix	IPv6 prefix obtained through ND/RA.
IPv6 Address Pool	Subscriber IPv6 address pool. The IPv6 address pool is used to allocate IPv6 prefixes to the DHCPv6 clients.
IPv6 Network Prefix Length	Length of the network portion of the IPv6 address.
IPv6 Prefix Length	Length of the subscriber IPv6 prefix.

Table 15: show subscribers Output Fields *(continued)*

Field Name	Field Description
Logical System	Logical system associated with the subscriber.
Routing Instance	Routing instance associated with the subscriber.
Interface Type	Whether the subscriber interface is **Static** or **Dynamic**.
Interface Set	Internally generated name of the dynamic ACI interface set used by the subscriber session.
Interface Set Type	Interface type of the ACI interface set: **Dynamic**. This is the only ACI interface set type currently supported.
Interface Set Session ID	Identifier of the dynamic ACI interface set entry in the session database.
Underlying Interface	Name of the underlying interface for the subscriber session.
Dynamic Profile Name	Dynamic profile used for the subscriber.
Dynamic Profile Version	Version number of the dynamic profile used for the subscriber.
MAC Address	MAC address associated with the subscriber.
State	Current state of the subscriber session (**Init**, **Configured**, **Active**, **Terminating**, **Tunneled**).
L2TP State	Current state of the L2TP session, **Tunneled** or **Tunnel-switched**. When the value is **Tunnel-switched**, two entries are displayed for the subscriber; the first entry is at the LNS interface on the LTS and the second entry is at the LAC interface on the LTS.
Tunnel switch Profile Name	Name of the L2TP tunnel switch profile that initiates tunnel switching.
Local IP Address	IP address of the local gateway (LAC).
Remote IP Address	IP address of the remote peer (LNS).
VLAN Id	VLAN ID associated with the subscriber in the form *tpid.vlan-id*.
Stacked VLAN Id	Stacked VLAN ID associated with the subscriber in the form *tpid.vlan-id*.
RADIUS Accounting ID	RADIUS accounting ID associated with the subscriber.
Agent Circuit ID	Option 82 agent circuit ID associated with the subscriber. The ID is displayed as an ASCII string unless the value has nonprintable characters, in which case it is displayed in hexadecimal format.
Agent Remote ID	Option 82 agent remote ID associated with the subscriber. The ID is displayed as an ASCII string unless the value has nonprintable characters, in which case it is displayed in hexadecimal format.
DHCP Relay IP Address	IP address used by the DHCP relay agent.

Table 15: show subscribers Output Fields *(continued)*

Field Name	Field Description
ATM VPI	(MX Series routers with MPCs and ATM MICs with SFP only) ATM virtual path identifier (VPI) on the subscriber's physical interface.
ATM VCI	(MX Series routers with MPCs and ATM MICs with SFP only) ATM virtual circuit identifier (VCI) for each VPI configured on the subscriber interface.
Login Time	Date and time at which the subscriber logged in.
Effective shaping-rate	Actual downstream traffic shaping rate for the subscriber, in kilobits per second.
IPv4 rpf-check Fail Filter Name	Name of the filter applied by the dynamic profile to IPv4 packets that fail the RPF check.
IPv6 rpf-check Fail Filter Name	Name of the filter applied by the dynamic profile to IPv6 packets that fail the RPF check.
DHCP Options	**len** = number of hex values in the message. The hex values specify the type, length, value (TLV) for DHCP options, as defined in RFC 2132.
Session ID	ID number for a subscriber service session.
Underlying Session ID	For DHCPv6 subscribers on a PPPoE network, displays the session ID of the underlying PPPoE interface.
Service Sessions	Number of service sessions (that is, a service activated using RADIUS CoA) associated with the subscribers.
Service Session Name	Service session profile name.
Session Timeout (seconds)	Number of seconds of access provided to the subscriber before the session is automatically terminated.
Idle Timeout (seconds)	Number of seconds subscriber can be idle before the session is automatically terminated.
IPv6 Delegated Address Pool	Name of the pool used for DHCPv6 prefix delegation.
IPv6 Delegated Network Prefix Length	Length of the prefix configured for the IPv6 delegated address pool.
IPv6 Interface Address	Address assigned by the Framed-Ipv6-Prefix AAA attribute.
IPv6 Framed Interface Id	Interface ID assigned by the Framed-Interface-Id AAA attribute.
ADF IPv4 Input Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv4 input filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.

Table 15: show subscribers Output Fields *(continued)*

Field Name	Field Description
ADF IPv4 Output Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv4 output filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.
ADF IPv6 Input Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv6 input filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.
ADF IPv6 Output Filter Name	Name assigned to the Ascend-Data-Filter (ADF) interface IPv6 output filter (client or service session). The filter name is followed by the rules (in hexadecimal format) associated with the ADF filter and the decoded rule in Junos OS filter style.
IPv4 Input Filter Name	Name assigned to the IPv4 input filter (client or service session).
IPv4 Output Filter Name	Name assigned to the IPv4 output filter (client or service session).
IPv6 Input Filter Name	Name assigned to the IPv6 input filter (client or service session).
IPv6 Output Filter Name	Name assigned to the IPv6 output filter (client or service session).
IFL Input Filter Name	Name assigned to the logical interface input filter (client or service session).
IFL Output Filter Name	Name assigned to the logical interface output filter (client or service session).

Sample Output

show subscribers (IPv4)

```
user@host> show subscribers
Interface               IP Address/VLAN ID   User Name         LS:RI
ge-1/3/0.1073741824     100                                    default:default
demux0.1073741824       100.0.0.10           WHOLESALER-CLIENT default:default
demux0.1073741825       101.0.0.3            RETAILER1-CLIENT  test1:retailer1
demux0.1073741826       102.0.0.3            RETAILER2-CLIENT  test1:retailer2
```

show subscribers (IPv6)

```
user@host> show subscribers
Interface          IP Address/VLAN ID   User Name           LS:RI
ge-1/0/0.0         2001::c0:0:0:0/74    WHOLESALER-CLIENT   default:default
     *             2002::1/128          subscriber-25       default:default
```

show subscribers (IPv4 and IPv6 Dual Stack)

```
user@host> show subscribers
Interface           IP Address/VLAN ID         User Name
LS:RI
demux0.1073741834   0x8100.1002 0x8100.1
default:default
demux0.1073741835   0x8100.1001 0x8100.1
default:default
pp0.1073741836      61.1.1.1                dualstackuser1@ISP1.com
```

```
default:ASP-1
*                   2041:1:1::/48
*                   2061:1:1:1::/64
pp0.1073741837      23.1.1.3                dualstackuser2@ISP1.com
default:ASP-1
*                   2001:1:2:5::/64
```

show subscribers (LNS on MX Series Routers)

```
user@host> show subscribers
Interface          IP Address/VLAN ID   User Name         LS:RI
si-4/0/0.1         192.168.4.1          xyz@example.com   default:default
```

show subscribers (L2TP Switched Tunnels)

```
user@host> show subscribers
Interface           IP Address/VLAN ID    User Name             LS:RI
si-2/1/0.1073741842 Tunnel-switched       ap@lts.com        default:default

si-2/1/0.1073741843 Tunnel-switched       ap@lts.com        default:default
```

show subscribers client-type dhcp detail

```
user@host> show subscribers client-type dhcp detail
Type: DHCP
IP Address: 100.20.9.7
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: demux0.1073744127
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:10:95:00:00:98
State: Active
Radius Accounting ID: jnpr :2304
Login Time: 2009-08-25 14:43:52 PDT

Type: DHCP
IP Address: 100.20.10.7
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: demux0.1073744383
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:10:94:00:01:f3
State: Active
Radius Accounting ID: jnpr :2560
Login Time: 2009-08-25 14:43:56 PDT
```

show subscribers count

```
user@host> show subscribers count
Total Subscribers: 188, Active Subscribers: 188
```

show subscribers address detail (IPv6)

```
user@host> show subscribers address 100.16.12.137 detail
```

```
Type: PPPoE
User Name: pppoeTerV6User1Svc
IP Address: 100.16.12.137
IP Netmask: 255.0.0.0
IPv6 User Prefix: 1016:0:0:c88::/64
Logical System: default
Routing Instance: default
Interface: pp0.1073745151
Interface type: Dynamic
Underlying Interface: demux0.8201
Dynamic Profile Name: pppoe-client-profile
MAC Address: 00:0d:02:01:00:01
Session Timeout (seconds): 31622400
Idle Timeout (seconds): 86400
State: Active
Radius Accounting ID: jnpr demux0.8201:6544
Session ID: 6544
Agent Circuit ID: ifl3720
Agent Remote ID: ifl3720
Login Time: 2012-05-21 13:37:27 PDT
Service Sessions: 1
```

show subscribers detail (IPv4)

```
user@host> show subscribers detail
Type: DHCP
IP Address: 100.20.9.7
IP Netmask: 255.255.0.0
Primary DNS Address: 192.168.17.1
Secondary DNS Address: 192.168.17.2
Primary WINS Address: 192.168.22.1
Secondary WINS Address: 192.168.22.2
Logical System: default
Routing Instance: default
Interface: demux0.1073744127
Interface type: Dynamic
Dynamic Profile Name: dhcp-demux-prof
MAC Address: 00:10:95:00:00:98
State: Active
Radius Accounting ID: jnpr :2304
Idle Timeout (seconds): 600
Login Time: 2009-08-25 14:43:52 PDT
DHCP Options: len 52
35 01 01 39 02 02 40 3d 07 01 00 10 94 00 00 08 33 04 00 00
00 3c 0c 15 63 6c 69 65 6e 74 5f 50 6f 72 74 20 2f 2f 36 2f
33 2d 37 2d 30 37 05 01 06 0f 21 2c
Service Sessions: 2
```

show subscribers detail (IPv6)

```
user@host> show subscribers detail
Type: DHCP
User Name: pd-user1
IPv6 Prefix: 2002:db2:ffff:1::/64
Logical System: default
Routing Instance: default
Interface: ge-3/1/3.2
Interface type: Static
MAC Address: 00:51:ff:ff:00:03
State: Active
Radius Accounting ID: 1
```

```
Session ID: 1
Login Time: 2011-08-25 12:12:26 PDT
DHCP Options: len 42
00 08 00 02 00 00 00 01 00 0a 00 03 00 01 00 51 ff ff 00 03
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
```

show subscribers detail (IPv6 Static Demux Interface)

```
user@host> show subscribers detail
Type: STATIC-INTERFACE
User Name: demux0.1@jnpr.net
IPv6 Prefix: 1:2:3:4:5:6:7:aa/128
Logical System: default
Routing Instance: default
Interface: demux0.1
Interface type: Static
Dynamic Profile Name: junos-default-profile
State: Active
Radius Accounting ID: 185
Login Time: 2010-05-18 14:33:56 EDT
```

show subscribers detail (L2TP LNS Subscribers on MX Series Routers)

```
user@host> show subscribers detail
Type: L2TP
User Name: user1@jnpr.net
IP Address: 10.1.32.58
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: si-5/2/0.1073749824
Interface type: Dynamic
Dynamic Profile Name: dyn-lns-profile2
Dynamic Profile Version: 1
State: Active
Radius Accounting ID: 8001
Session ID: 8001
Login Time: 2011-04-25 20:27:50 IST
```

show subscribers detail (L2TP Switched Tunnels)

```
user@host> show subscribers detail
Type: L2TP
User Name: ap@example.com
Logical System: default
Routing Instance: default
Interface: si-2/1/0.1073741842
Interface type: Dynamic
Dynamic Profile Name: dyn-lts-profile
State: Active
L2TP State: Tunnel-switched
Tunnel switch Profile Name: ce-lts-profile
Local IP Address: 10.50.1.1
Remote IP Address: 192.168.20.3
Radius Accounting ID: 21
Session ID: 21
Login Time: 2013-01-18 03:01:11 PST

Type: L2TP
User Name: ap@example.com
Logical System: default
```

```
Routing Instance: default
Interface: si-2/1/0.1073741843
Interface type: Dynamic
Dynamic Profile Name: dyn-lts-profile
State: Active
L2TP State: Tunnel-switched
Tunnel switch Profile Name: ce-lts-profile
Local IP Address: 10.30.1.1
Remote IP Address: 172.20.1.10
Session ID: 22
Login Time: 2013-01-18 03:01:14 PST
```

show subscribers detail (Tunneled Subscriber)

```
user@host> show subscribers detail
Type: PPPoE
User Name: user1@example.com
Logical System: default
Routing Instance: default
Interface: pp0.1
State: Active, Tunneled
Radius Accounting ID: 512
```

show subscribers detail (IPv4 and IPv6 Dual Stack)

```
user@host> show subscribers detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlanProfile
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.1001
VLAN Id: 0x8100.1
Login Time: 2011-11-30 00:18:04 PST

Type: PPPoE
User Name: dualstackuser1@ISP1.com
IP Address: 61.1.1.1
IPv6 Prefix: 2041:1:1::/48
IPv6 User Prefix: 2061:1:1:1::/64
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: dualStack-Profile1
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-11-30 00:18:05 PST

Type: DHCP
IPv6 Prefix: 2041:1:1::/48
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:64:03:01:02
```

```
State: Active
Radius Accounting ID: jnpr :3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-11-30 00:18:35 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 00 64 03 01 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
```

show subscribers detail (ACI Interface Set Session)

```
user@host> show subscribers detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0
Interface Set: aci-1001-ge-1/0/0.2800
Interface Set Session ID: 0
Underlying Interface: ge-1/0/0.2800
Dynamic Profile Name: aci-vlan-set-profile-2
Dynamic Profile Version: 1
State: Active
Session ID: 1
Agent Circuit ID: aci-ppp-dhcp-20
Login Time: 2012-05-26 01:54:08 PDT
```

show subscribers detail (PPPoE Subscriber Session with ACI Interface Set)

```
user@host> show subscribers detail
Type: PPPoE
User Name: ppphint2
IP Address: 10.10.1.5
Logical System: default
Routing Instance: default
Interface: pp0.1073741825
Interface type: Dynamic
Interface Set: aci-1001-demux0.1073741824
Interface Set Type: Dynamic
Interface Set Session ID: 2
Underlying Interface: demux0.1073741824
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:64:39:01:02
State: Active
Radius Accounting ID: 3
Session ID: 3
Agent Circuit ID: aci-ppp-dhcp-dvlan-50
Login Time: 2012-03-07 13:46:53 PST
```

show subscribers extensive

```
user@host> show subscribers extensive
Type: DHCP
User Name: pd-user1
IPv6 Prefix: 2002:db2:ffff:1::/64
Logical System: default
Routing Instance: default
Interface: ge-3/1/3.2
Interface type: Static
MAC Address: 00:51:ff:ff:00:03
```

```
State: Active
Radius Accounting ID: 1
Session ID: 1
Login Time: 2011-08-25 12:12:26 PDT
DHCP Options: len 42
00 08 00 02 00 00 00 01 00 0a 00 03 00 01 00 51 ff ff 00 03
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
IPv6 Address Pool: pd_pool
IPv6 Network Prefix Length: 48
```

show subscribers extensive (RPF Check Fail Filter)

```
user@host> show subscribers extensive
...
Type: VLAN
  Logical System: default
  Routing Instance: default
  Interface: ae0.1073741824
  Interface type: Dynamic
  Dynamic Profile Name: vlan-prof
  State: Active
  Session ID: 9
  VLAN Id: 100
  Login Time: 2011-08-26 08:17:00 PDT
  IPv4 rpf-check Fail Filter Name: rpf-allow-dhcp
  IPv6 rpf-check Fail Filter Name: rpf-allow-dhcpv6
...
```

show subscribers extensive (L2TP LNS Subscribers on MX Series Routers)

```
user@host> show subscribers extensive
Type: L2TP
User Name: user1@jnpr.net
IP Address: 10.1.32.58
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: si-5/2/0.1073749824
Interface type: Dynamic
Dynamic Profile Name: dyn-lns-profile2
Dynamic Profile Version: 1
State: Active
Radius Accounting ID: 8001
Session ID: 8001
Login Time: 2011-04-25 20:27:50 IST
IPv4 Input Filter Name: classify-si-5/2/0.1073749824-in
IPv4 Output Filter Name: classify-si-5/2/0.1073749824-out
```

show subscribers extensive (IPv4 and IPv6 Dual Stack)

```
user@host> show subscribers extensive
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlanProfile
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.1001
VLAN Id: 0x8100.1
```

```
Login Time: 2011-11-30 00:18:04 PST

Type: PPPoE
User Name: dualstackuser1@ISP1.com
IP Address: 61.1.1.1
IPv6 Prefix: 2041:1:1::/48
IPv6 User Prefix: 2061:1:1:1::/64
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Dynamic
Dynamic Profile Name: dualStack-Profile1
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: 2
Session ID: 2
Login Time: 2011-11-30 00:18:05 PST
IPv6 Delegated Network Prefix Length: 48
IPv6 Interface Address: 2061:1:1:1::1/64
IPv6 Framed Interface Id: 1:1:2:2
IPv4 Input Filter Name: FILTER-IN-pp0.1073741825-in
IPv4 Output Filter Name: FILTER-OUT-pp0.1073741825-out
IPv6 Input Filter Name: FILTER-IN6-pp0.1073741825-in
IPv6 Output Filter Name: FILTER-OUT6-pp0.1073741825-out

Type: DHCP
IPv6 Prefix: 2041:1:1::/48
Logical System: default
Routing Instance: ASP-1
Interface: pp0.1073741825
Interface type: Static
MAC Address: 00:00:64:03:01:02
State: Active
Radius Accounting ID: jnpr :3
Session ID: 3
Underlying Session ID: 2
Login Time: 2011-11-30 00:18:35 PST
DHCP Options: len 42
00 08 00 02 0b b8 00 01 00 0a 00 03 00 01 00 00 64 03 01 02
00 06 00 02 00 19 00 19 00 0c 00 00 00 00 00 00 00 00 00 00
00 00
IPv6 Delegated Network Prefix Length: 48
```

show subscribers extensive (Effective Shaping-Rate)

```
user@host> show subscribers extensive
Type: VLAN
Logical System: default
Routing Instance: default
Interface: demux0.1073741837
Interface type: Dynamic
Interface Set: ifset-1
Underlying Interface: ae1
Dynamic Profile Name: svlan-dhcp-test
State: Active
Session ID: 1
Stacked VLAN Id: 0x8100.201
VLAN Id: 0x8100.201
Login Time: 2011-11-30 00:18:04 PST
```

```
Effective shaping-rate: 31000000k
...
```

show subscribers aci-interface-set-name detail (Subscriber Sessions Using Specified ACI Interface Set)

```
user@host> show subscribers aci-interface-set-name aci-1003-ge-1/0/0.4001 detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-set-profile
Dynamic Profile Version: 1
State: Active
Session ID: 13
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:56 PDT

Type: PPPoE
User Name: ppphint2
IP Address: 10.10.1.7
Logical System: default
Routing Instance: default
Interface: pp0.1073741834
Interface type: Dynamic
Interface Set: aci-1003-ge-1/0/0.4001
Interface Set Type: Dynamic
Interface Set Session ID: 13
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:65:26:01:02
State: Active
Radius Accounting ID: 14
Session ID: 14
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:57 PDT
```

show subscribers agent-circuit-identifier detail (Subscriber Sessions Using Specified ACI Substring)

```
user@host> show subscribers agent-circuit-identifier aci-ppp-vlan detail
Type: VLAN
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-set-profile
Dynamic Profile Version: 1
State: Active
Session ID: 13
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:56 PDT

Type: PPPoE
User Name: ppphint2
IP Address: 10.10.1.7
Logical System: default
Routing Instance: default
Interface: pp0.1073741834
Interface type: Dynamic
Interface Set: aci-1003-ge-1/0/0.4001
```

```
Interface Set Type: Dynamic
Interface Set Session ID: 13
Underlying Interface: ge-1/0/0.4001
Dynamic Profile Name: aci-vlan-pppoe-profile
Dynamic Profile Version: 1
MAC Address: 00:00:65:26:01:02
State: Active
Radius Accounting ID: 14
Session ID: 14
Agent Circuit ID: aci-ppp-vlan-10
Login Time: 2012-03-12 10:41:57 PDT
```

show subscribers interface extensive

```
user@host> show subscribers interface demux0.1073741826 extensive
Type: VLAN
User Name: test1@test.com
Logical System: default
Routing Instance: testnet
Interface: demux0.1073741826
Interface type: Dynamic
Dynamic Profile Name: profile-vdemux-relay-23qos
MAC Address: 00:00:6e:56:01:04
State: Active
Radius Accounting ID: 12
Session ID: 12
Stacked VLAN Id: 0x8100.1500
VLAN Id: 0x8100.2902
Login Time: 2011-10-20 16:21:59 EST

Type: DHCP
User Name: test1@test.com
IP Address: 172.16.200.6
IP Netmask: 255.255.255.0
Logical System: default
Routing Instance: testnet
Interface: demux0.1073741826
Interface type: Static
MAC Address: 00:00:6e:56:01:04
State: Active
Radius Accounting ID: 21
Session ID: 21
Login Time: 2011-10-20 16:24:33 EST
Service Sessions: 2

Service Session ID: 25
Service Session Name: SUB-QOS
State: Active

Service Session ID: 26
Service Session Name: service-cb-content
State: Active
IPv4 Input Filter Name: content-cb-in-demux0.1073741826-in
IPv4 Output Filter Name: content-cb-out-demux0.1073741826-out
```

show subscribers logical-system terse

```
user@host> show subscribers logical-system test1 terse
Interface           IP Address/VLAN ID   User Name         LS:RI
demux0.1073741825     101.0.0.3            RETAILER1-CLIENT  test1:retailer1
demux0.1073741826     102.0.0.3            RETAILER2-CLIENT  test1:retailer2
```

show subscribers physical-interface count

```
user@host> show subscribers physical-interface ge-1/0/0 count
Total subscribers: 3998, Active Subscribers: 3998
```

show subscribers routing-instance inst1 count

```
user@host> show subscribers routing-instance inst1 count
Total Subscribers: 188, Active Subscribers: 183
```

show subscribers stacked-vlan-id detail

```
user@host> show subscribers stacked-vlan-id 101 detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

show subscribers stacked-vlan-id vlan-id detail (Combined Output)

```
user@host> show subscribers stacked-vlan-id 101 vlan-id 100 detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

show subscribers stacked-vlan-id vlan-id interface detail (Combined Output for a Specific Interface)

```
user@host> show subscribers stacked-vlan-id 101 vlan-id 100 interface ge-1/2/0.* detail
Type: VLAN
Interface: ge-1/2/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: svlan-prof
State: Active
Stacked VLAN Id: 0x8100.101
VLAN Id: 0x8100.100
Login Time: 2009-03-27 11:57:19 PDT
```

show subscribers user-name detail

```
user@host> show subscribers user-name larry1 detail
Type: DHCP
User Name: larry1
IP Address: 100.0.0.37
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: ge-1/0/0.1
Interface type: Static
Dynamic Profile Name: foo
MAC Address: 00:10:94:00:00:01
State: Active
Radius Accounting ID: 1
Session ID: 1
```

```
Login Time: 2011-11-07 08:25:59 PST
DHCP Options: len 52
35 01 01 39 02 02 40 3d 07 01 00 10 94 00 00 01 33 04 00 00
00 3c 0c 15 63 6c 69 65 6e 74 5f 50 6f 72 74 20 2f 2f 32 2f
37 2d 30 2d 30 37 05 01 06 0f 21 2c
```

show subscribers vlan-id

```
user@host> show subscribers vlan-id 100
Interface           IP Address                              User Name
ge-1/0/0.1073741824
ge-1/2/0.1073741825
```

show subscribers vlan-id detail

```
user@host> show subscribers vlan-id 100 detail
Type: VLAN
Interface: ge-1/0/0.1073741824
Interface type: Dynamic
Dynamic Profile Name: vlan-prof-tpid
State: Active
VLAN Id: 100
Login Time: 2009-03-11 06:48:54 PDT

Type: VLAN
Interface: ge-1/2/0.1073741825
Interface type: Dynamic
Dynamic Profile Name: vlan-prof-tpid
State: Active
VLAN Id: 100
Login Time: 2009-03-11 06:48:54 PDT
```

show subscribers vpi vci extensive (PPPoE-over-ATM Subscriber Session)

```
user@host> show subscribers vpi 40 vci 50 extensive
Type: PPPoE
User Name: testuser
IP Address: 100.0.0.2
IP Netmask: 255.255.0.0
Logical System: default
Routing Instance: default
Interface: pp0.0
Interface type: Static
MAC Address: 00:00:65:23:01:02
State: Active
Radius Accounting ID: 2
Session ID: 2
ATM VPI: 40
ATM VCI: 50
Login Time: 2012-12-03 07:49:26 PST
IP Address Pool: pool_1
IPv6 Framed Interface Id: 200:65ff:fe23:102
```

show subscribers summary

Syntax

show subscribers summary
<all>
< detail | extensive | terse>
<count>
<physical-interface *physical-interface-name*>
<logical-system *logical-system* pic | port | routing-instance *routing-instance* | slot>

Release Information

Command introduced in Junos OS Release 10.2.

Description

Display summary information for subscribers.

Options

all—(Optional) Display full subscriber summary.

detail | extensive | terse—(Optional) Display the specified level of output.

count—(Optional) Display the count of total subscribers and active subscribers for any specified option.

logical-system—(Optional) Display subscribers whose logical system matches the specified logical system.

physical-interface-name—(M120, M320, and MX Series routers only) (Optional) Display a count of subscribers whose physical interface matches the specified physical interface, by subscriber state, client type and LS:RI.

pic—(M120, M320, and MX Series routers only) (Optional) Display a count of subscribers by PIC number and the total number of subscribers.

port—(M120, M320, and MX Series routers only) (Optional) Display a count of subscribers by port number and the total number of subscribers.

routing-instance—(Optional) Display subscribers whose routing instance matches the specified routing instance.

slot—(M120, M320, and MX Series routers only) (Optional) Display a count of subscribers by FPC slot number and the total number of subscribers.

NOTE: **Due to display limitations, logical system and routing instance output values are truncated when necessary.**

Required Privilege Level

view

Related Documentation

- show subscribers on page 246

List of Sample Output

show subscribers summary on page 266

show subscribers summary all on page 266
show subscribers summary physical-interface on page 266
show subscribers summary physical-interface pic on page 267
show subscribers summary physical-interface port on page 267
show subscribers summary physical-interface slot on page 267
show subscribers summary pic on page 267
show subscribers summary pic (Aggregated Ethernet Interfaces) on page 268
show subscribers summary port on page 268
show subscribers summary slot on page 268
show subscribers summary terse on page 268

Output Fields Table 16 on page 265 lists the output fields for the **show subscribers** command. Output fields are listed in the approximate order in which they appear.

Table 16: show subscribers Output Fields

Field Name	Field Description
Subscribers by State	Number of subscribers summarized by state. The summary information includes the following: • Init—Number of subscriber currently in the initialization state. • Configured—Number of configured subscribers. • Active—Number of active subscribers. • Terminating—Number of subscribers currently terminating. • Terminated—Number of terminated subscribers. • Total—Total number of subscribers for all states.
Subscribers by Client Type	Number of subscribers summarized by client type. Client types can include DHCP, L2TP, PPP, PPPOE, STATIC-INTERFACE, and VLAN. Also displays the total number of subscribers for all client types (Total).
Subscribers by LS:RI	Number of subscribers summarized by logical system:routing instance (LS:RI) combination. Also displays the total number of subscribers for all LS:RI combinations (Total).
Interface	Interface associated with the subscriber. The router or switch displays subscribers whose interface matches or begins with the specified interface. The * character indicates a continuation of addresses for the same session. For aggregated Ethernet interfaces, the output of the **summary (pic | port | slot)** options prefixes the interface name with **ae0:**.
Count	Count of subscribers displayed for each PIC, port, or slot when those options are specified with the **summary** option. For an aggregated Ethernet configuration, the total subscriber count does not equal the sum of the individual PIC, port, or slot counts, because each subscriber can be in more than one aggregated Ethernet link.
Total Subscribers	Total number of subscribers for all physical interfaces, all PICS, all ports, or all LS:RI slots.
IP Address/VLAN ID	Subscriber IP address or VLAN ID associated with the subscriber in the form *tpid.vlan-id*
User Name	Name of subscriber.
LS:RI	Logical system and routing instance associated with the subscriber.

Sample Output

show subscribers summary

```
user@host> show subscribers summary

Subscribers by State
 Init      3
 Configured    2
 Active   183
 Terminating    2
 Terminated    1

 TOTAL        191

Subscribers by Client Type
 DHCP     107
 PPP       76
 VLAN       8

 TOTAL        191
```

show subscribers summary all

```
user@host> show subscribers summary all
Subscribers by State
 Init         3
 Configured       2
 Active      183
 Terminating       2
 Terminated       1

 TOTAL          191

Subscribers by Client Type
 DHCP      107
 PPP          76
 VLAN          8

 TOTAL         191

Subscribers by LS:RI
 default:default   1
 default:ri1     28
 default:ri2     16
 ls1:default    22
 ls1:riA     38
 ls1:riB     44
 logsysX:routinstY  42

 TOTAL     191
```

show subscribers summary physical-interface

```
user@host> show subscribers summary physical-interface ge-1/0/0
Subscribers by State
   Active: 3998
   Total: 3998

Subscribers by Client Type
   DHCP: 3998
```

```
   Total: 3998

Subscribers by LS:RI
   default:default: 3998
   Total: 3998
```

show subscribers summary physical-interface pic

```
user@host> show subscribers summary physical-interface ge-0/2/0 pic
Subscribers by State
   Active: 4825
   Total: 4825

Subscribers by Client Type
   DHCP: 4825
   Total: 4825

Subscribers by LS:RI
   default:default: 4825
   Total: 4825
```

show subscribers summary physical-interface port

```
user@host> show subscribers summary physical-interface ge-0/3/0 port
Subscribers by State
   Active: 4825
   Total: 4825

Subscribers by Client Type
   DHCP: 4825
   Total: 4825

Subscribers by LS:RI
   default:default: 4825
   Total: 4825
```

show subscribers summary physical-interface slot

```
user@host> show subscribers summary physical-interface ge-2/0/0 slot
Subscribers by State
   Active: 4825
   Total: 4825

Subscribers by Client Type
   DHCP: 4825
   Total: 4825

Subscribers by LS:RI
   default:default: 4825
   Total: 4825
```

show subscribers summary pic

```
user@host> show subscribers summary pic
Interface           Count
ge-1/0              1000
ge-1/3              1000

Total Subscribers: 2000
```

show subscribers summary pic (Aggregated Ethernet Interfaces)

```
user@host> show subscribers summary pic
Interface           Count
ae0: ge-1/0         801
ae0: ge-1/3         801

Total Subscribers: 801
```

show subscribers summary port

```
user@host> show subscribers summary port
Interface           Count
ge-1                2000

Total Subscribers: 2000
```

show subscribers summary slot

```
user@host> show subscribers summary slot
Interface           Count
ge-1                2000

Total Subscribers: 2000
```

show subscribers summary terse

```
user@host> show subscribers summary terse
Interface           IP Address/VLAN ID   User Name         LS:RI
ge-1/3/0.1073741824   100                                   default:default
demux0.1073741824     100.0.0.10           WHOLESALER-CLIENT default:default
demux0.1073741825     101.0.0.3            RETAILER1-CLIENT  test1:retailer1
demux0.1073741826     102.0.0.3            RETAILER2-CLIENT  test1:retailer2
```

PART 4

Troubleshooting

- Acquiring Troubleshooting Information on page 271

CHAPTER 10

Acquiring Troubleshooting Information

- Collecting Subscriber Access Logs Before Contacting Juniper Technical Support on page 271

Collecting Subscriber Access Logs Before Contacting Juniper Technical Support

Problem **Description:** When you experience a subscriber access problem in your network, we recommend that you collect certain logs before you contact Juniper Technical Support. This topic shows you the most useful logs for a variety of network implementations. In addition to the relevant log information, you must also collect standard troubleshooting information and send it to Juniper Technical Support in your request for assistance.

Solution To collect standard troubleshooting information:

- Redirect the command output to a file.

  user@host> **request support information | save rsi-1**

To configure logging to assist Juniper Technical Support:

1. Review the following blocks of statements to determine which apply to your configuration.

```
[edit]
set system syslog archive size 100m files 25
set system auto-configuration traceoptions file filename
set system auto-configuration traceoptions file filename size 100m files 25
set protocols ppp-service traceoptions file filename size 100m files 25
set protocols ppp-service traceoptions level all
set protocols ppp-service traceoptions flag all
set protocols ppp traceoptions file filename size 100m files 25
set protocols ppp traceoptions level all
set protocols ppp traceoptions flag all
set protocols ppp monitor-session all
set interfaces pp0 traceoptions flag all
set demux traceoptions file filename size 100m files 25
set demux traceoptions level all
set demux traceoptions flag all
set system processes dhcp-service traceoptions file filename
set system processes dhcp-service traceoptions file size 100m
set system processes dhcp-service traceoptions file files 25
set system processes dhcp-service traceoptions flag all
set class-of-service traceoptions file filename
set class-of-service traceoptions file size 100m
set class-of-service traceoptions flag all
set class-of-service traceoptions file files 25
set routing-options traceoptions file filename
set routing-options traceoptions file size 100m
set routing-options traceoptions flag all
set routing-options traceoptions file files 25
set interfaces traceoptions file filename
set interfaces traceoptions file size 100m
set interfaces traceoptions flag all
set interfaces traceoptions file files 25
set system processes general-authentication-service traceoptions file filename
set system processes general-authentication-service traceoptions file size 100m
set system processes general-authentication-service traceoptions flag all
set system processes general-authentication-service traceoptions file files 25
```

2. Copy the relevant statements into a text file and modify the log filenames as you want.
3. Copy the statements from the text file and paste them into the CLI on your router to configure logging.
4. Commit the logging configuration to begin collecting information.

NOTE: The maximum file size for DHCP local server and DHCP relay log files is 1 GB. The maximum number of log files for DHCP local server and DHCP relay is 1000.

BEST PRACTICE: Enable these logs only to collect information when troubleshooting specific problems. Enabling these logs during normal operations can result in reduced system performance.

Related Documentation

- *Compressing Troubleshooting Logs from /var/logs to Send to Juniper Technical Support*

PART 5

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- Index on page 277

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