



Junos[®] OS

Dynamic PPPoE for Subscriber Access

Release

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Junos[®] OS Dynamic PPPoE for Subscriber Access

14.1

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About the Documentation

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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/>.

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

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Supported Platforms

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

- MX Series
- M320

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.xml;
    }
  }
}
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.xml; }
```

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 xi 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 xi 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.	<code>user@host> show chassis alarms</code> <code>No alarms currently active</code>
<i>Italic text like this</i>	<ul style="list-style-type: none">Introduces or emphasizes important new terms.Identifies guide names.Identifies RFC and Internet draft titles.	<ul style="list-style-type: none">A policy <i>term</i> is a named structure that defines match conditions and actions.<i>Junos OS CLI User Guide</i>RFC 1997, <i>BGP Communities Attribute</i>
<i>Italic text like this</i>	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 <i>domain-name</i>
Text like this	Represents names of configuration statements, commands, files, and directories; configuration hierarchy levels; or labels on routing platform components.	<ul style="list-style-type: none">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 <i>metric</i>>;
(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 (<i>string1</i> <i>string2</i> <i>string3</i>)
# (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 [<i>community-ids</i>]
Indentation and braces ({ })	Identifies a level in the configuration hierarchy.	[edit] routing-options { static { route default { nexthop <i>address</i> ; 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.	<ul style="list-style-type: none">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 send your comments to techpubs-comments@juniper.net, or fill out the documentation feedback form at <https://www.juniper.net/cgi-bin/docbugreport/>. If you are using e-mail, be sure to include the following information with your comments:

- Document or topic name
- URL or page number
- Software release version (if applicable)

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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>.
- Product warranties—For product warranty information, visit <http://www.juniper.net/support/warranty/>.
- JTAC hours of operation—The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

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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 PPPoE in Subscriber Access Networks on page 3](#)
- [Dynamic PPPoE and PPPoE Service Name Tables on page 21](#)

CHAPTER 1

Dynamic PPPoE in Subscriber Access Networks

- [Subscriber Interfaces and PPPoE Overview on page 3](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)
- [PPPoE Maximum Session Limit Overview on page 10](#)
- [Guidelines for Using PPPoE Maximum Session Limit from RADIUS on page 12](#)
- [PPPoE Subscriber Session Lockout Overview on page 13](#)
- [Understanding the Lockout Period for PPPoE Subscriber Session Lockout on page 18](#)
- [Subscriber Management Unified ISSU Support on page 20](#)

Subscriber Interfaces and PPPoE Overview

You can configure the router to dynamically create Point-to-Point Protocol over Ethernet (PPPoE) logical interfaces on statically created underlying Ethernet interfaces. The router automatically and transparently creates the dynamic interface in response to the receipt of a PPPoE Active Discovery Request (PADR) control packet on the underlying interface. Because the router creates a dynamic PPPoE logical interface on demand when a subscriber logs in to the network, dynamic PPPoE logical interfaces are also referred to as *dynamic PPPoE subscriber interfaces*.

To enable the router to create a dynamic PPPoE logical interface on an underlying Ethernet interface, you define the attributes of the PPPoE logical interface in a dynamic profile, and then attach the dynamic profile to an Ethernet interface configured with PPPoE encapsulation. When the router receives a PADR control packet from a PPPoE client on an underlying interface with a PPPoE dynamic profile attached, the router uses the attributes defined in the profile to instantiate a dynamic PPPoE subscriber interface to handle the PPPoE session.

This overview covers the following topics:

- [Benefits of Using Dynamic PPPoE Subscriber Interfaces on page 4](#)
- [Supported Platforms for Dynamic PPPoE Subscriber Interfaces on page 5](#)
- [Sequence of Operations for PPPoE Subscriber Access on page 5](#)

Benefits of Using Dynamic PPPoE Subscriber Interfaces

Configuring and using dynamic PPPoE subscriber interfaces offers the following benefits:

- On-demand dynamic interface creation

Configuring dynamic PPPoE subscriber interfaces provides the flexibility of dynamically creating the PPPoE subscriber interface only when needed; that is, when a subscriber logs in on the associated underlying Ethernet interface. By contrast, statically created interfaces allocate and consume system resources when the interface is created.

Configuring and using dynamically created interfaces helps you effectively and conveniently manage edge or access networks in which large numbers of subscribers are constantly logging in to and logging out from the network on a transient basis.

- Dynamic removal of PPPoE subscriber interfaces without manual intervention

When the PPPoE subscriber logs out or the PPPoE session is terminated, the router dynamically deletes the associated PPPoE subscriber interface without your intervention, thereby restoring any consumed resources to the router.

- Use of dynamic profiles to efficiently manage multiple subscriber interfaces

A *dynamic profile* is a set of characteristics that can be dynamically assigned to subscriber interfaces. By using a profile, you reduce the management of a large number of interfaces by applying a set of common characteristics to multiple interfaces. When you configure a dynamic profile for PPPoE, you use predefined dynamic variables in the profile to represent information that varies from subscriber to subscriber, such as the logical unit number and underlying interface name. These variables are dynamically replaced with the values supplied by the network when the subscriber logs in.

- Denial of service (DoS) protection

You can optionally configure the underlying Ethernet interface with certain PPPoE-specific attributes that can reduce the potential for DoS attacks. Duplicate protection, which is disabled by default, prevents activation of another dynamic PPPoE logical interface on the underlying interface when a PPPoE logical interface for the same client is already active on the underlying interface. You can also specify the maximum number of PPPoE sessions that the router can activate on the underlying interface. By enabling duplicate protection and restricting the maximum number of PPPoE sessions on the underlying interface, you can ensure that a single toxic PPPoE client cannot monopolize allocation of the PPPoE session.

- Support for dynamic PPPoE subscriber interface creation from PPPoE service name tables

You can assign a previously configured PPPoE dynamic profile to a named, **empty**, or **any** service entry in a PPPoE service name table, or to an agent circuit identifier/agent remote identifier (ACI/ARI) pair defined for these services. The router uses the attributes defined in the profile to instantiate a dynamic PPPoE subscriber interface based on the service name, ACI, and ARI information provided by the PPPoE client during PPPoE negotiation. To specify the routing instance in which to instantiate the dynamic PPPoE subscriber interface, you can assign a previously configured routing instance to a named, **empty**, or **any** service, or to an ACI/ARI pair defined for these services. The dynamic

profile and routing instance configured for the PPPoE service name table overrides the dynamic profile and routing instance assigned to the PPPoE underlying interface on which the dynamic subscriber interface is created.

Supported Platforms for Dynamic PPPoE Subscriber Interfaces

Configuration of dynamic PPPoE subscriber interfaces over static underlying Ethernet interfaces is supported on the following routing platforms:

- Intelligent Queuing 2 (IQ2) PICs on M120 Multiservice Edge Router and M320 Multiservice Edge Router
- MPC/MIC interfaces on MX Series 3D Universal Edge Routers

Sequence of Operations for PPPoE Subscriber Access

When a PPPoE subscriber logs in to the network, the PPPoE protocol defines the sequence of operations by which a connection is established and traffic flow is enabled on the dynamic PPPoE subscriber interface. Similarly, when the PPPoE subscriber logs out from the network, PPPoE defines the sequence that occurs to terminate the connection and remove the dynamic PPPoE subscriber interface from the router.

The router creates a dynamic PPPoE subscriber interface for each new PPPoE session, and removes the dynamic PPPoE subscriber interface when the session is terminated due to subscriber logout, PPP negotiation failure, or down status of the underlying Ethernet interface. Dynamic PPPoE subscriber interfaces are never reused for multiple PPPoE sessions.

Sequence When a PPPoE Subscriber Logs In

In a PPPoE subscriber network, the router acts as a *remote access concentrator*, also known as a *PPPoE server*. For a PPPoE client to initiate a PPPoE session with a PPPoE server, it must first perform PPPoE Discovery to identify the Ethernet MAC address of the remote access concentrator that can service its request. Based on the network topology, there may be more than one remote access concentrator with which the client can communicate. The Discovery process enables a PPPoE client to find all remote access concentrators and then select one to connect to.

The following sequence occurs when a PPPoE subscriber logs in to the network. Steps 1 through 5 in this sequence are part of the PPPoE Discovery process.

1. The PPPoE client broadcasts a PPPoE Active Discovery Initiation (PADI) packet to all remote access concentrators in the network.
2. One or more remote access concentrators respond to the PADI packet by sending a PPPoE Active Discovery Offer (PADO) packet, indicating that they can service the client request. The PADO packet includes the name of the access concentrator from which it was sent.
3. The client sends a unicast PPPoE Active Discovery Request (PADR) packet to the access concentrator it selects.

4. On receipt of the PADR packet on the underlying interface associated with a PPPoE dynamic profile, the router uses the attributes configured in the dynamic profile to create the dynamic PPPoE logical interface.
5. The router sends a PPPoE Active Discovery Session (PADS) packet to confirm establishment of the PPPoE connection.
6. The PPP Link Control Protocol (LCP) negotiates the PPP link between the client and the PPPoE server.
7. The subscriber is authenticated using the PPP authentication protocol (CHAP or PAP) configured in the PPPoE dynamic profile.
8. The PPP Network Control Protocol (NCP) negotiates the IP routing protocol and network family.
9. The PPP server issues an IP access address for the client, and the router adds the client access route to its routing table.
10. The router instantiates the dynamic profile and applies the attributes configured in the profile to the dynamic PPPoE subscriber interface.
11. PPP NCP negotiation completes, enabling traffic flow between the PPPoE client and the PPPoE server.

Sequence When a PPPoE Subscriber Logs Out

The following sequence occurs when a PPPoE subscriber logs out of the network:

1. The client terminates the PPP connection and the router receives an LCP termination request.
2. The router removes the client access router from its routing table.
3. The router sends or receives a PPPoE Active Discovery Termination (PADT) packet to end the PPPoE connection.
4. The router deactivates the subscriber, gathers final statistics for the PPPoE session, and sends the RADIUS server an Acct-Stop accounting message.
5. The router de-instantiates the PPPoE dynamic profile and removes the PPPoE logical interface. The router does not reuse the PPPoE logical interface for future dynamic PPPoE sessions.

Related Documentation

- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)
- [Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles on page 31](#)
- [Configuring PPPoE Service Name Tables](#)

Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview

Creating a dynamic PPPoE subscriber interface over a static underlying Ethernet interface consists of two basic steps:

1. Configure a dynamic profile to define the attributes of the PPPoE logical interface.
2. Attach the dynamic profile to a statically created underlying Ethernet interface configured with PPPoE encapsulation.

This overview describes the concepts you need to understand to configure a dynamic PPPoE subscriber interface, and covers the following topics:

- [PPPoE Dynamic Profile Configuration on page 7](#)
- [PPPoE Underlying Interface Configuration on page 8](#)
- [Address Assignment for Dynamic PPPoE Subscriber Interfaces on page 8](#)
- [Guidelines for Configuring Dynamic PPPoE Subscriber Interfaces on page 9](#)

PPPoE Dynamic Profile Configuration

A *dynamic profile* is a template for configuring a dynamic interface. You use predefined dynamic variables in the PPPoE dynamic profile to represent information that varies from subscriber to subscriber, such as the logical unit number and underlying interface name. These variables are dynamically replaced with the values supplied by the network when the subscriber logs in. On receipt of traffic on an underlying Ethernet interface to which a dynamic profile is attached, the router creates the dynamic PPPoE logical interface, also referred to as a *dynamic PPPoE subscriber interface*, on the underlying interface and applies the properties configured in the dynamic profile.

To provide basic access for PPPoE subscribers, the dynamic profile must provide a minimal configuration for a **pp0** (PPPoE) logical interface that includes at least the following attributes:

- The logical unit number, represented by the **\$junos-interface-unit** predefined dynamic variable
- The name of the underlying Ethernet interface, represented by the **\$junos-underlying-interface** predefined dynamic variable
- Configuration of the router to act as a PPPoE server
- The PPP authentication protocol (PAP or CHAP)
- The unnumbered address for the **inet** (IPv4) or **inet6** (IPv6) protocol family

You can also optionally configure additional options for PPPoE subscriber access in the dynamic profile, including:

- The keepalive interval, or the option to disable sending keepalive messages
- The IPv4 or IPv6 address of the dynamic PPPoE logical interface

- The service sets and filters, input filters, and output filters to be applied to the dynamic PPPoE logical interface

PPPoE Underlying Interface Configuration

After you configure a dynamic profile to define the attributes of a dynamic PPPoE subscriber interface, you must attach the dynamic profile to the underlying Ethernet interface on which you want the router to dynamically create the PPPoE logical interface. The underlying interface for a dynamic PPPoE logical interface must be statically created and configured with PPPoE (**ppp-over-ether**) encapsulation. When a PPPoE subscriber logs in on the underlying interface, the router dynamically creates the PPPoE logical interface and applies the attributes defined in the profile to the interface.

In addition to attaching the dynamic profile to the interface, you can also configure the underlying interface with one or more of the following optional PPPoE-specific attributes:

- Prevention of another dynamic PPPoE logical interface from being activated on the underlying interface when a PPPoE logical interface for a client with the same MAC address is already active on that interface
- Maximum number of dynamic PPPoE logical interfaces (sessions) that the router can activate on the underlying interface
- An alternative access concentrator name in the AC-NAME tag in a PPPoE control packet

Address Assignment for Dynamic PPPoE Subscriber Interfaces

If the subscriber address for a dynamic PPPoE interface is not specified by means of the Framed-IP-Address (8) or Framed-Pool (88) RADIUS IETF attributes during authentication, the router allocates an IP address from the first IPv4 local address-assignment pool defined in the routing instance. For this reason, make sure that the local address assigned for the **inet** (IPv4) address family is in the same subnet as the addresses obtained from the first IPv4 local address-assignment pool.

The router allocates the IP address from the first IPv4 local address-assignment pool under either of the following conditions:

- RADIUS returns no address attributes.
- RADIUS authentication does not take place because only address allocation is requested.

If the first IPv4 local address-assignment pool has no available addresses, or if no IPv4 local address-assignment pools are configured, the router does not allocate an IP address to the dynamic PPPoE subscriber interface, and denies access to the associated subscriber. To avoid depletion of IP addresses, you can configure linked address-assignment pools on the first IPv4 local address-assignment pool to create one or more backup pools.

For more information, see *Configuring Address-Assignment Pools*.

Guidelines for Configuring Dynamic PPPoE Subscriber Interfaces

Observe the following guidelines when you configure dynamic PPPoE subscriber interfaces:

- You can configure dynamic PPPoE subscriber interfaces for the **inet** (IPv4) and **inet6** (IPv6) protocol families.
- When you configure the **pp0** (PPPoE) logical interface in a PPPoE dynamic profile, you must include the **pppoe-options** subhierarchy at the **[edit dynamic-profiles *profile-name* interfaces pp0 unit “\$junos-interface-unit”]** hierarchy level. At a minimum, the **pppoe-options** subhierarchy must include the name of the underlying Ethernet interface, represented by the **\$junos-underlying-interface** predefined dynamic variable, and the **server** statement, which configures the router to act as a PPPoE server. If you omit the **pppoe-options** subhierarchy from the configuration, the **commit** operation fails.
- When you configure CHAP or PAP authentication in a PPPoE dynamic profile, you cannot configure additional options for the **chap** or **pap** statements. This is because the router supports only unidirectional authentication for dynamic interfaces; that is, the router always functions as the authenticator.
- When you attach the PPPoE dynamic profile to an underlying Ethernet interface, ensure that both of the following conditions are met:
 - The PPPoE dynamic profile has already been configured on the router.
 - The underlying Ethernet interface has already been statically configured on the router with PPPoE (**ppp-over-ether**) encapsulation.
- You cannot attach a PPPoE dynamic profile to an underlying Ethernet interface that is already associated with static PPPoE logical interfaces. Conversely, you cannot associate static PPPoE logical interfaces with an underlying Ethernet interface that already has a PPPoE dynamic profile attached.

Related Documentation

- [Subscriber Interfaces and PPPoE Overview on page 3](#)
- [Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles on page 31](#)
- [Example: Configuring a Dynamic PPPoE Subscriber Interface on a Static Gigabit Ethernet VLAN Interface on page 51](#)
- [Understanding PPPoE Service Name Tables on page 21](#)

PPPoE Maximum Session Limit Overview

The maximum session limit for PPPoE subscriber interfaces specifies the maximum number of concurrent static or dynamic PPPoE logical interfaces (sessions) that the router can activate on the PPPoE underlying interface, or the maximum number of active static or dynamic PPPoE sessions that the router can establish with a particular service entry in a PPPoE service name table.

You can configure the PPPoE maximum session limit in one of two ways:

- On a per-interface basis, by using the **max-sessions** CLI statement
- (Default) On a per-subscriber basis, by using the value returned by RADIUS in the Max-Clients-Per-Interface Juniper Networks vendor-specific attribute (VSA) [26-143]

This overview describes the concepts you need to understand to configure the PPPoE maximum session limit, and covers the following topics:

- [Per-Interface Configuration for PPPoE Maximum Session Limit Using the CLI on page 10](#)
- [Per-Subscriber Configuration for PPPoE Maximum Session Limit Using RADIUS on page 10](#)
- [Override of PPPoE Maximum Session Limit from RADIUS on page 11](#)

Per-Interface Configuration for PPPoE Maximum Session Limit Using the CLI

To configure the PPPoE maximum session limit for a particular interface, you can use the **max-sessions** statement to specify either or both of the following, depending on the hierarchy level at which you include the statement:

- The maximum number of concurrent PPPoE sessions that the router can activate on the PPPoE underlying interface
- The maximum number of active PPPoE sessions using either static or dynamic PPPoE interfaces that the router can establish with a particular named service entry, **empty** service entry, or **any** service entry in a PPPoE service name table

You can configure the PPPoE maximum session value from 1 through the platform-specific default for your router. The default value is equal to the maximum number of PPPoE sessions supported on your routing platform. If the number of active PPPoE sessions exceeds the value configured with the **max-sessions** statement, the router prohibits creation of any new PPPoE sessions, and the PPPoE application on the router returns a PPPoE Active Discovery Session (PADS) packet with an error to the PPPoE client.

Changing the PPPoE maximum session value has no effect on dynamic PPPoE subscriber interfaces that are already active.

Per-Subscriber Configuration for PPPoE Maximum Session Limit Using RADIUS

To configure the PPPoE maximum session limit for a particular subscriber, you can use the value returned by the RADIUS server in the Max-Clients-Per-Interface Juniper Networks VSA [26-143] during the subscriber authentication process. For PPPoE clients, the

Max-Clients-Per-Interface VSA returns the maximum number of sessions (PPPoE subinterfaces) per PPPoE major interface.

By default, the PPPoE maximum session value returned by RADIUS in the Max-Clients-Per-Interface VSA takes precedence over the PPPoE maximum session value configured with the **max-sessions** statement.

If you configure multiple subscribers on the same PPPoE underlying VLAN interface and RADIUS returns a different PPPoE maximum session value for each subscriber, the router uses the most recent PPPoE maximum session value returned by RADIUS to determine whether to override the current PPPoE maximum session value and create the new PPPoE session.

The following sequence describes how the router obtains the PPPoE maximum session value from RADIUS when a PPPoE subscriber logs in to initiate a session with the router. (In a PPPoE subscriber network, the router functions as a *remote access concentrator*, also known as a *PPPoE server*.)

1. The PPPoE client and the router participate in the PPPoE Discovery process to establish the PPPoE connection.
2. The PPP Link Control Protocol (LCP) negotiates the PPP link between the client and the router.
3. The PPP application sends the subscriber authentication request to the AAA application.
4. AAA sends the authentication request to an external RADIUS server.
5. The RADIUS server returns the PPPoE maximum session value for that subscriber to AAA in the Max-Clients-Per-Interface VSA as part of an Access-Accept message.



NOTE: The RADIUS server does not return the Max-Clients-Per-Interface VSA in Change of Authorization Request (CoA-Request) messages.

6. AAA passes the response from RADIUS to PPP.
7. PPP validates the subscriber parameters and, if authentication succeeds, passes the PPPoE maximum session value returned by RADIUS to the PPPoE application.
8. PPPoE uses the maximum session value returned by RADIUS to determine whether to override the current PPPoE maximum session value and create or tear down the new PPPoE session.

Override of PPPoE Maximum Session Limit from RADIUS

By default, the PPPoE maximum session value returned by RADIUS in the Max-Clients-Per-Interface VSA [26-143] takes precedence over the PPPoE maximum session value configured with the **max-sessions** statement. To configure the router to ignore (clear) the PPPoE maximum session value returned by the RADIUS server in the Max-Clients-Per-Interface VSA, include the **max-sessions-vsa-ignore** statement at the same hierarchy levels that you can specify the **max-sessions** statement.

Including the **max-sessions-vsa-ignore** statement in your configuration restores the PPPoE maximum session value on the underlying interface to the value configured in the CLI with the **max-sessions** statement.

Related Documentation

- [Guidelines for Using PPPoE Maximum Session Limit from RADIUS on page 12](#)
- [Juniper Networks VSAs Supported by the AAA Service Framework](#)
- [Limiting the Maximum Number of PPPoE Sessions on the Underlying Interface on page 41](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

Guidelines for Using PPPoE Maximum Session Limit from RADIUS

Consider the following guidelines when you use the PPPoE maximum session value returned by RADIUS in the Max-Clients-Per-Interface vendor-specific attribute (VSA) [26-143]:

- If the current number of sessions (including newly created sessions) is *less than* the new PPPoE maximum session value returned by RADIUS, the PPPoE application overrides the current value and enables interface creation to proceed.
- If the current number of sessions (including newly created sessions) is *equal to* the new PPPoE maximum session value returned by RADIUS, the PPPoE application overrides the current value and enables interface creation to proceed.
- If the current number of sessions (including newly created sessions) is *greater than* the new PPPoE maximum session value returned by RADIUS, the PPPoE application overrides the current value and brings down the new interface.

To illustrate these guidelines, [Table 3 on page 12](#) shows examples of how the router handles the PPPoE session when the current number of sessions is less than (first row), equal to (second row), and greater than (third row) the new PPPoE maximum session value returned by RADIUS when a new subscriber logs in.

Table 3: Sample PPPoE Maximum Session Values During Subscriber Login

New PPPoE Maximum Session Value from RADIUS	Current PPPoE Maximum Session Value	Existing Number of PPPoE Sessions	New PPPoE Maximum Session Value	New Number of PPPoE Sessions	Status of Session
10	5	4	10	5	PPPoE session up
5	5	4	5	5	PPPoE session up
3	5	4	3	4	PPPoE session down

- Related Documentation**
- [PPPoE Maximum Session Limit Overview on page 10](#)
 - [Juniper Networks VSAs Supported by the AAA Service Framework](#)
 - [Limiting the Maximum Number of PPPoE Sessions on the Underlying Interface on page 41](#)
 - [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

PPPoE Subscriber Session Lockout Overview

PPPoE subscriber session lockout, which is sometimes referred to as PPPoE encapsulation type lockout, configures the router to temporarily prevent (lock out) a failed or short-lived static or dynamic PPPoE subscriber session from reconnecting for a default or configurable period of time. This time period, known as the *lockout period*, is derived from a formula and increases exponentially based on the number of successive reconnection failures.

This overview describes the concepts you need to understand to configure PPPoE subscriber session lockout, and covers the following topics:

- [Benefits of Using PPPoE Subscriber Session Lockout on page 13](#)
- [Supported Platforms and Underlying Interfaces for PPPoE Subscriber Session Lockout on page 14](#)
- [How PPPoE Subscriber Session Lockout Works on page 15](#)
- [PPPoE Subscriber Session Lockout Period on page 15](#)
- [PPPoE Encapsulation Type Lockout on page 16](#)
- [PPPoE Subscriber Session Lockout and Duplicate Protection on page 17](#)
- [PPPoE Subscriber Session Lockout and Automatic Removal of Dynamic Subscriber VLANs on page 17](#)

Benefits of Using PPPoE Subscriber Session Lockout

Configuring and using PPPoE subscriber session lockout provides the following benefits:

- Reduces excessive loading on the router

By temporarily locking out failed or short-lived PPPoE sessions, PPPoE subscriber session lockout protects the router from excessive loading by:

- Reducing the resources required to receive and process PPPoE control packets to negotiate and terminate short-lived connections
- Reducing the resources required to allocate and deallocate services, such as class of service (CoS) and firewall filters, for failed or short-lived subscriber sessions

PPPoE subscriber session lockout increases router efficiency by temporarily deferring failed or short-lived subscriber sessions in favor of those sessions that can complete successfully.

- Reduces excessive loading on external authentication, authorization, and accounting (AAA) servers

PPPoE subscriber session lockout protects any external AAA servers, such as RADIUS or Diameter, from excessive loading:

- As a result of failed or short-lived PPPoE subscriber sessions that occur repeatedly for the same subscriber
- By reducing the resources required to authenticate and terminate these connections
- Enables lockout of a single failed or short-lived PPP session without disrupting other PPP sessions on the same PPPoE underlying interface

In some subscriber network configurations, the PPPoE underlying interface supports multiple upper-layer PPP sessions. Because PPPoE subscriber session lockout identifies each subscriber session by its unique media access control (MAC) source address on the underlying interface, the router is able to lock out only the offending PPP session while enabling other PPP sessions on the same underlying interface to successfully negotiate the connection.

Supported Platforms and Underlying Interfaces for PPPoE Subscriber Session Lockout

You can configure PPPoE subscriber session lockout on the following platforms and underlying interface types:

- Supported platforms:
 - Intelligent Queuing 2 (IQ2) PICs on M120 Multiservice Edge Router and M320 Multiservice Edge Router
 - MPC/MIC interfaces on MX Series 3D Universal Edge Routers
- Supported PPPoE underlying interfaces:
 - Static VLAN logical interface
 - Static VLAN demultiplexing (demux) logical interface
 - Dynamic VLAN logical interface
 - Dynamic VLAN demux logical interface

How PPPoE Subscriber Session Lockout Works

PPPoE subscriber session lockout is disabled on the router by default. When you enable PPPoE subscriber session lockout by issuing the **short-cycle-protection** statement, the router does the following:

1. Detects a short-lived subscriber session, also referred to as a *short-cycle event*.
A short-lived subscriber session is detected, partially or completely created, and terminated by the router within 150 seconds. The router identifies each PPPoE subscriber session by its unique MAC source address on the PPPoE underlying interface.
2. Tracks the time between repeated short-cycle events to determine whether to increase the lockout time for a subsequent short-cycle event.
3. Applies a time penalty for each short-cycle event based on a default or configured lockout period and the number of consecutive short-cycle events that occur repeatedly for the same subscriber.

If you enable PPPoE subscriber session lockout but do not configure a lockout time range, the router uses the default lockout time range of 1 through 300 seconds (5 minutes).

4. Temporarily locks out the specified PPPoE subscriber by preventing connection to the router.

During lockout, the router drops negotiation packets for the PPPoE subscriber session until the lockout period expires. When the lockout period expires, the PPPoE subscriber session and its associated MAC source address resume normal negotiation of the connection.

Repeated creation of multiple short-lived (short-cycle) PPPoE subscriber sessions can cause excessive loading on the router. Conditions that can cause a short-lived subscriber session include:

- Authentication denials from external AAA servers, such as RADIUS, due to the absence of a corresponding entry in the RADIUS database or due to improper login attempts
- Configuration errors within a dynamic profile or RADIUS record
- Insufficient memory resources to create a dynamic PPPoE subscriber interface
- Protocol failure or error within the dynamic PPPoE subscriber interface
- Client logout shortly after a successful login; this action creates a complete dynamic PPPoE subscriber interface before the interface is torn down

PPPoE Subscriber Session Lockout Period

The lockout period is the time during which the router temporarily prevents (locks out) a failed or short-lived PPPoE subscriber session identified by a unique MAC source address or an agent circuit identifier (ACI) value on the PPPoE underlying interface from reconnecting to the router. You can use the default lockout time range of 1 through 300 seconds (5 minutes), or you can override the default lockout period by configuring a nondefault lockout time in the range 1 through 86,400 seconds (24 hours).

PPPoE Encapsulation Type Lockout

Configuring and using PPPoE subscriber session lockout increases router efficiency and protects the router and any external AAA servers from excessive loading by temporarily deferring failed or short-lived subscriber sessions in favor of those sessions that can complete successfully. PPPoE subscriber session lockout enables you to prevent (lock out) a failed or short-lived PPPoE subscriber session from reconnecting to the router for a default or configurable period of time, based on either of the following options:

- The subscriber session's unique MAC source address on the PPPoE underlying interface

This option, which is the default, locks out the offending PPPoE subscriber session identified by its MAC source address on the underlying interface.

- The ACI string contained in the DSL Forum Agent-Circuit-ID VSA [26-1] (option 0x105) of PPPoE Active Discovery Initiation (PADI) and PPPoE Active Discovery Request (PADR) control packets

This option locks out all PPPoE subscriber sessions on the underlying interface that come from the same household and share the same ACI string in their PPPoE PADI and PADR control packets.

PPPoE subscriber session lockout based on the ACI value is particularly useful for configurations such as the following in which MAC source addresses are not unique on the PPPoE underlying interface:

- PPPoE interworking function sessions in which the MAC addresses of all PPPoE inter-working function sessions contain the MAC address of the DSLAM device
- Configurations in which the access node (usually a DSLAM device) overwrites the MAC source address in PPPoE packets received from the customer premises equipment (CPE) with its own MAC address for security purposes
- Duplicate MAC source addresses across disparate households in an N:1 (service VLAN) configuration, which requires the router to use a combination of the MAC source address and the ACI value to uniquely identify a subscriber

To configure temporary PPPoE subscriber session lockout based on the ACI value, include the short-cycle-protection statement with the new filter aci option for PPPoE subscriber sessions on any of the following underlying logical interfaces types:

- Dynamic or static VLAN interfaces (in the pppoe-underlying-options stanza)
- Dynamic or static VLAN demultiplexing (demux) interfaces (in the family pppoe stanza)

For example, the following statement configures temporary lockout based on ACI information for PPPoE subscriber sessions on a dynamic VLAN underlying interface. This statement specifies a nondefault lockout time in the range 20 through 120 seconds.

```
[edit dynamic-profiles my-vlan-profile interfaces "$junos-interface-ifd-name" unit
"$junos-interface-unit" pppoe-underlying options]
user@host# set short-cycle-protection lockout-time-min 20 lockout-time-max 120 filter
aci
```

The following statement configures temporary lockout based on ACI information for PPPoE subscriber sessions on a dynamic VLAN demux underlying interface. This statement uses the default lockout time range 1 through 300 seconds.

```
[edit dynamic-profiles my-demux-vlan-profile interfaces demux0 unit
 "$junos-interface-unit" family pppoe]
user@host# set short-cycle-protection filter aci
```



NOTE: MAC-based encapsulation type lockout is used if ACI is not in the PPPoE attributes when ACI-level encapsulation type lockout is configured. With ACI-based encapsulation type lockout, PPPoE clients without an ACI attribute are also locked-out.

PPPoE Subscriber Session Lockout and Duplicate Protection

Duplicate protection, which is disabled on the router by default, prevents the activation of another PPPoE subscriber session on the same PPPoE underlying interface when a PPPoE subscriber session with the same media access control (MAC) address is already active on that interface. When you configure PPPoE subscriber session lockout, we recommend that you enable duplicate protection to ensure that the MAC source address for each active PPPoE session is unique on the underlying interface.

With PPPoE subscriber session lockout configured, the router identifies subscriber sessions by their unique MAC source address. If the router detects a short-lived (short-cycle) subscriber session, it applies the default or configured lockout period to that MAC source address to temporarily prevent reconnection. If the MAC source address is not unique on the underlying interface, multiple PPPoE subscriber sessions with the same MAC source address might also be affected by the lockout.

PPPoE Subscriber Session Lockout and Automatic Removal of Dynamic Subscriber VLANs

You can configure automatic removal of subscriber VLANs that have no PPPoE client sessions by issuing the **remove-when-no-subscribers** statement at the **[edit interfaces interface-name auto-configure]** hierarchy level. 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 PPPoE client undergoing lockout on the underlying interface.

Related Documentation

- [Understanding the Lockout Period for PPPoE Subscriber Session Lockout on page 18](#)
- [Configuring Lockout of PPPoE Subscriber Sessions on page 43](#)
- [Clearing Lockout of PPPoE Subscriber Sessions on page 151](#)
- [Verifying and Managing Dynamic PPPoE Configuration on page 152](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

Understanding the Lockout Period for PPPoE Subscriber Session Lockout

When you configure PPPoE subscriber session lockout, the router applies a time penalty called the *lockout period* for each failed or short-lived subscriber session. During the lockout period, the router temporarily prevents (locks out) a failed or short-lived PPPoE subscriber session identified by a unique media access control (MAC) source address from reconnecting to the router.

This overview describes how the router determines and applies the PPPoE subscriber session lockout period, and covers the following topics:

- [Duration of PPPoE Subscriber Session Lockout Period on page 18](#)
- [How the Router Determines the PPPoE Subscriber Session Lockout Period on page 19](#)

Duration of PPPoE Subscriber Session Lockout Period

The duration of the lockout period is based on a default or configured lockout time and the number of consecutive short-cycle (short-lived) events that occur repeatedly for the same subscriber. When you include the **short-cycle-protection** statement to configure PPPoE subscriber session lockout on a PPPoE underlying interface, you can use the default lockout time range of 1 through 300 seconds (5 minutes), or you can override the default lockout period by configuring a nondefault lockout time in the range 1 through 86,400 seconds (24 hours).

The lockout time penalty applied by the router for each short-cycle event differs depending on the event. For example, some short-cycle events represent normal subscriber behavior, such as a PPPoE subscriber logging in once per hour to check e-mail and logging out shortly thereafter. The router does not noticeably penalize a subscriber for these types of events.

By contrast, other short-cycle events are the result of repeated attempts to log in to the router for reasons such as an incorrectly typed password, customer premises equipment (CPE) that performs repeated auto-retries, or malicious attempts to access the Internet illegally. For these types of short-cycle events, the router applies a lockout time penalty that starts with a short time interval and increases exponentially. In these instances, the initial lockout time is short enough to avoid noticeably penalizing a subscriber who, for example, types a password incorrectly several times before entering the correct one.

For example, using the default lockout time range of 1 through 300 seconds, the increasing lockout period on the router is: 1 second, 2 seconds, 4 seconds, 8 seconds, 16 seconds, 32 seconds, 64 seconds, 128 seconds, 256 seconds, and finally, 300 seconds (5 minutes).

How the Router Determines the PPPoE Subscriber Session Lockout Period

The router uses the following rules to determine the PPPoE subscriber session lockout period for short-lived PPPoE subscriber sessions:

- The lockout period is derived from the following formula:

$$(\text{minimum lockout time}) * (2^{n-1})$$

where n represents the number of consecutive short-cycle events for the same subscriber. The router identifies a PPPoE subscriber session by its MAC source address, which should be unique on the underlying PPPoE interface.

- The router increments the value of n when the time between short-cycle events is either within 15 minutes or the maximum lockout time, whichever is greater.
- When the time between short-cycle events is greater than either 15 minutes or the maximum lockout time, the value of n reverts to 1. This condition is referred to as a *lockout grace period*.
- The lockout period never exceeds the maximum configured lockout time.

For example, for a configured (nondefault) lockout time in the range 20 through 120 seconds, the increasing lockout period on the router is: 20 seconds, 40 seconds, 80 seconds, and finally, 120 seconds (2 minutes).

- A *short-cycle event* is detected, partially or completely created, and terminated by the router within 150 seconds. The router tracks the time between short-cycle events to determine whether to increase the lockout time for a subsequent short-cycle event for the same subscriber.



NOTE: When the calculated lockout time is equal to or exceeds the maximum lockout time, the router uses the maximum lockout time value until the time to the next short-cycle event exceeds the greater of 15 minutes or the maximum lockout time value. At that point, the lockout time reverts to the minimum lockout time value.

- The minimum lockout time value cannot exceed the maximum lockout time value.

When the minimum and maximum lockout time values are equal, the lockout time becomes fixed at that value.

Related Documentation

- [PPPoE Subscriber Session Lockout Overview on page 13](#)
- [Configuring Lockout of PPPoE Subscriber Sessions on page 43](#)
- [Clearing Lockout of PPPoE Subscriber Sessions on page 151](#)
- [Verifying and Managing Dynamic PPPoE Configuration on page 152](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

Subscriber Management Unified ISSU Support

The unified in-service software upgrade (unified ISSU) feature supports both the DHCP access model and the PPPoE access model used by subscriber management. This support ensures that the router preserves active DHCP and PPPoE subscriber sessions and session services after a unified ISSU has completed.

See *Unified ISSU Concepts* for a description of the supported platforms and modules, CLI statements, and procedures you use to configure and initiate unified ISSU. You can use the **issu** flag with the **traceoptions** statement to trace subscriber management unified ISSU events. You can also use the **show system subscriber-management summary** command to display information about the unified ISSU state.

This overview describes specific considerations for unified ISSU support of the DHCP and PPPoE access models for subscriber management, and covers the following topics:

- [Unified ISSU Support for DHCP Access Model on page 20](#)
- [Unified ISSU Support for PPPoE Access Model on page 20](#)

Unified ISSU Support for DHCP Access Model

Unified ISSU supports the subscriber management DHCP access model, which includes DHCP local server, DHCPv6 local server, DHCP relay, and DHCP relay proxy.

Accounting, filter, and class of service (CoS) statistics for DHCP subscribers are preserved after a unified ISSU on MPC/MIC interfaces on MX Series routers.

Unified ISSU Support for PPPoE Access Model

Unified ISSU supports the subscriber management PPPoE access model for static and dynamic PPPoE access, and includes the following features:

- Terminated, non-tunneled PPPoE connections configured with static or dynamic PPP logical interfaces and static or dynamic underlying interfaces
- Subscriber services on single-link PPP interfaces
- Preservation of statistics for accounting, filter, and CoS on MPC/MIC interfaces

Accounting statistics for PPPoE subscribers are *not* preserved after a unified ISSU on Enhanced Intelligent Queuing 2 (IQ2E) PICs on M120 and M320 routers.

Unified ISSU for the subscriber management PPPoE access model *does not support* Multilink Point-to-Point Protocol (MLPPP) bundle interfaces. MLPPP bundle interfaces require the use of an Adaptive Services PIC or Multiservices PIC to provide PPP subscriber services. These PICs do not support unified ISSU.

Related Documentation

- *Verifying and Monitoring Subscriber Management Unified ISSU State*
- *Unified ISSU Support on MX Series 3D Universal Edge Routers in Unified ISSU System Requirements*
- *Unified ISSU Concepts*

CHAPTER 2

Dynamic PPPoE and PPPoE Service Name Tables

- [Understanding PPPoE Service Name Tables on page 21](#)
- [Evaluation Order for Matching Client Information in PPPoE Service Name Tables on page 26](#)

Understanding PPPoE Service Name Tables

On an M120 router, M320 router, or MX Series router acting as a remote access concentrator (AC), also referred to as a *PPPoE server*, you can configure up to 32 PPPoE service name tables and assign the service name tables to PPPoE underlying interfaces. A *PPPoE service name table* defines the set of *services* that the router can provide to a PPPoE client. Service entries configured in a PPPoE service name table represent the *service name tags* transmitted between the client and the router in a PPPoE control packet.

This overview covers the following topics to help you understand and configure PPPoE service name tables:

- [Interaction Among PPPoE Clients and Routers During the Discovery Stage on page 21](#)
- [Service Entries and Actions in PPPoE Service Name Tables on page 22](#)
- [ACI/ARI Pairs in PPPoE Service Name Tables on page 23](#)
- [Dynamic Profiles and Routing Instances in PPPoE Service Name Tables on page 24](#)
- [Maximum Sessions Limit in PPPoE Service Name Tables on page 24](#)
- [Static PPPoE Interfaces in PPPoE Service Name Tables on page 25](#)
- [PADO Advertisement of Named Services in PPPoE Service Name Tables on page 25](#)

Interaction Among PPPoE Clients and Routers During the Discovery Stage

In networks with mesh topologies, PPPoE clients are often connected to multiple PPPoE servers (remote ACs). During the PPPoE discovery stage, a PPPoE client identifies the Ethernet MAC address of the remote AC that can service its request, and establishes a unique PPPoE session identifier for a connection to that AC.

The following steps describe, at a high level, how the PPPoE client and the remote AC (router) use the PPPoE service name table to interact during the PPPoE discovery stage:

1. The PPPoE client broadcasts a PPPoE Active Discovery Initiation (PADI) control packet to all remote ACs in the network to request that an AC support certain services.

The PADI packet must contain either, but not both, of the following:

- One and only one nonzero-length service name tag that represents a specific client service
 - One and only one empty (zero-length) service name tag that represents an unspecified service
2. One or more remote ACs respond to the PADI packet by sending a PPPoE Active Discovery Offer (PADO) packet to the client, indicating that the AC can service the client request.

To determine whether it can service a particular client request, the router matches the service name tag received in the PADI packet against the service name tags configured in its service name table. If a matching service name tag is found in the PPPoE service name table, the router sends the client a PADO packet that includes the name of the AC from which it was sent. If no matching service name tag is found in the PPPoE service name table, the router drops the PADI request and does not send a PADO response to the client.

3. The PPPoE client sends a unicast PPPoE Active Discovery Request (PADR) packet to the AC to which it wants to connect, based on the responses received in the PADO packets.
4. The selected AC sends a PPPoE Active Discovery Session (PADS) packet to establish the PPPoE connection with the client.

Service Entries and Actions in PPPoE Service Name Tables

A PPPoE service name table can include three types of service entries: named services, an **empty** service, and an **any** service. For each service entry, you specify the action to be taken by the underlying interface when the router receives a PADI packet containing the specified service name tag.

You can configure the following services and actions in a PPPoE service name table:

- **Named service**—Specifies a PPPoE client service that an AC can support. For example, you might configure named services associated with different subscribers who log in to the PPPoE server, such as **user1-service** or **user2-service**, or that correspond to different ISP service level agreements, such as **premium** and **standard**. Each PPPoE service name table can include a maximum of 512 named service entries, excluding **empty** and **any** service entries. A named service is associated with the **terminate** action by default.
- **empty service**—A service tag of zero length that represents an unspecified service. Each PPPoE service name table includes one empty service. The **empty** service is associated with the **terminate** action by default.

- **any** service—Acts as a default service for non-empty service entries that do not match the named service entries or **empty** service entry configured in the PPPoE service name table. Each PPPoE service name table includes one **any** service. The **any** service is useful when you want to match the agent circuit identifier and agent remote identifier information for a PPPoE client, but do not care about the contents of the service name tag transmitted in the control packet. The **any** service is associated with the **drop** action by default.
- Action—Specifies the action taken by the underlying PPPoE interface assigned to the PPPoE service name table on receipt of a PADI packet from the client containing a particular service request. You can configure one of the following actions for the associated named service, **empty** service, **any** service, or agent circuit identifier/agent remote identifier (ACI/ARI) pair in the PPPoE service name table on the router:
 - **terminate**—(Default) Directs the router to immediately respond to the PADI packet by sending the client a PADO packet containing the name of the AC that can service the request. Named services, **empty** services, and ACI/ARI pairs are associated with the **terminate** action by default. Configuring the **terminate** action for a service enables you to more tightly control which PPPoE clients can access and receive services from a particular PPPoE server.
 - **delay**—Number of seconds that the PPPoE underlying interface waits after receiving a PADI packet from the client before sending a PADO packet in response. In networks with mesh topologies, you might want to designate a primary PPPoE server and a backup PPPoE server for handling a particular service request. In such a scenario, you can configure a delay for the associated service entry on the backup PPPoE server to allow sufficient time for the primary PPPoE server to respond to the client with a PADO packet. If the primary server does not send the PADO packet within the delay period configured on the backup server, then the backup server sends the PADO packet after the delay period expires.
 - **drop**—Directs the router to drop (ignore) a PADI packet containing the specified service name tag when received from a PPPoE client, which effectively denies the client's request to provide the associated service. The **any** service is associated with the **drop** action by default. To prohibit the router from responding to PADI packets that contain **empty** or **any** service name tags, you can configure the **drop** action for the empty or **any** service. You can also use the **drop** action in combination with ACI/ARI pairs to accept specific service name tags only from specific subscribers, as described in the following information about ACI/ARI pairs.

ACI/ARI Pairs in PPPoE Service Name Tables

To specify agent circuit identifier (ACI) and agent remote identifier (ARI) information for a named service, **empty** service, or **any** service in a PPPoE service name table, you can configure an ACI/ARI pair. An ACI/ARI pair contains an agent circuit ID string that identifies the DSLAM interface that initiated the service request, and an agent remote ID string that identifies the subscriber on the DSLAM interface that initiated the service request. You can think of an ACI/ARI pair as the representation of one or more PPPoE clients accessing the router by means of the PPPoE service name table.

ACI/ARI specifications support the use of wildcard characters in certain formats. You can configure a combined maximum of 8000 ACI/ARI pairs, both with and without wildcards, per PPPoE service name table. You can distribute the ACI/ARI pairs in any combination among the service entries in the service name table.

You must specify the action—**terminate**, **delay**, or **drop**—taken by the underlying PPPoE interface when it receives a client request containing vendor-specific ACI/ARI information that matches the ACI/ARI information configured in the PPPoE service name table on the router. An ACI/ARI pair is associated with the **terminate** action by default.

For example, assume that for the **user1-service** named service, you configure the **drop** action for the service and the **terminate** action for the associated ACI/ARI pairs. In this case, the ACI/ARI pairs identify the DSLAM interfaces and associated subscribers authorized to access the PPPoE server. Using this configuration causes the router to drop PADI packets containing the **user1-service** tag *unless* the PADI packet also contains vendor-specific ACI/ARI information that matches the subscribers identified in one or more of the ACI/ARI pairs. For PADI packets containing matching ACI/ARI information, the router sends an immediate PADO response to the client indicating that it can provide the requested service for the specified subscribers.

You can also associate a PPPoE dynamic profile, routing instance, and static PPPoE interface with an ACI/ARI pair.

Dynamic Profiles and Routing Instances in PPPoE Service Name Tables

You can associate a previously configured PPPoE dynamic profile with a named service, **empty** service, or **any** service in the PPPoE service name table, or with an ACI/ARI pair defined for these services. The router uses the attributes defined in the profile to instantiate a dynamic PPPoE subscriber interface based on the service name, ACI, and ARI information provided by the PPPoE client during PPPoE negotiation. The dynamic profile configured for a service entry or ACI/ARI pair in a PPPoE service name table overrides the dynamic profile assigned to the PPPoE underlying interface on which the dynamic PPPoE interface is created.

To specify the routing instance in which to instantiate the dynamic PPPoE interface, you can associate a previously configured routing instance with a named service, **empty** service, or **any** service in the PPPoE service name table, or with an ACI/ARI pair defined for these services. Like dynamic profiles configured for service entries or ACI/ARI pairs, the routing instance configured for the PPPoE service name table overrides the routing instance assigned to the PPPoE underlying interface.

For information about configuring the PPPoE service name table to create a dynamic PPPoE subscriber interface, see [“Assigning a Dynamic Profile and Routing Instance to a Service Name or ACI/ARI Pair for Dynamic PPPoE Interface Creation”](#) on page 46 in the *Junos OS Subscriber Management and Services Library*.

Maximum Sessions Limit in PPPoE Service Name Tables

To limit the number of PPPoE client sessions that can use a particular service entry in the PPPoE service name table, you can configure the maximum number of active PPPoE sessions using either dynamically-created or statically-created PPPoE interfaces that

the router can establish with a particular named service, **empty** service, or **any** service. (You cannot configure the maximum sessions limit for an ACI/ARI pair.) The maximum sessions limit must be in the range 1 through the platform-specific maximum PPPoE sessions supported for your routing platform. The router maintains a count of active PPPoE sessions for each service entry to determine when the maximum sessions limit has been reached.

The router uses the maximum sessions value for a service entry in the PPPoE service name table in conjunction with both of the following:

- The maximum sessions (**max-sessions**) value configured for the PPPoE underlying interface
- The maximum number of PPPoE sessions supported on your routing platform

If your configuration exceeds either of these maximum session limits, the router cannot establish the PPPoE session.

Static PPPoE Interfaces in PPPoE Service Name Tables

To reserve a previously configured static PPPoE interface for use only by the PPPoE client with matching ACI/ARI information, you can specify a single static PPPoE interface for each ACI/ARI pair defined for a named service entry, **empty** service entry, or **any** service entry in a PPPoE service name table. (You cannot configure a static interface for a service entry that does not have an ACI/ARI pair defined.) The static PPPoE interface associated with an ACI/ARI pair takes precedence over the general pool of static PPPoE interfaces associated with the PPPoE underlying interface configured on the router.

When you configure a static interface in the PPPoE service name table, make sure there is a one-to-one correspondence between the PPPoE client and the static interface. For example, if two clients have identical ACI/ARI information that matches the information in the PPPoE service name table, the router reserves the static interface for exclusive use by the first client that logs in to the router. As a result, the router prevents the second client from logging in.



NOTE: You cannot configure a static interface for an ACI/ARI pair already configured with a dynamic profile and routing instance. Conversely, you cannot configure a dynamic profile and routing instance for an ACI/ARI pair already configured with a static interface.

PADO Advertisement of Named Services in PPPoE Service Name Tables

By default, the advertisement of named services in PADO control packets sent by the router to the PPPoE client is disabled. You can enable advertisement of named services in the PADO packet as a global option when you configure the PPPoE protocol on the router. Configuring PADO advertisement notifies PPPoE clients of the services that the router (AC) can offer.

If you enable advertisement of named services in PADO packets, make sure the number and length of all advertised service entries does not exceed the maximum transmission unit (MTU) size supported by the PPPoE underlying interface.

**Related
Documentation**

- [Evaluation Order for Matching Client Information in PPPoE Service Name Tables on page 26](#)
- *Benefits of Configuring PPPoE Service Name Tables*
- *Configuring PPPoE Service Name Tables*
- *Example: Configuring a PPPoE Service Name Table*
- For information about creating dynamic PPPoE subscriber interfaces, see [Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles on page 31](#) in the *Junos OS Subscriber Management and Services Library*
- *PPPoE Overview*
- *Ethernet Interfaces*

Evaluation Order for Matching Client Information in PPPoE Service Name Tables

When the router receives a service request from a PPPoE client, it evaluates the entries configured in the PPPoE service name table to find a match for the client's ACI/ARI information so it can take the appropriate action.

The order of evaluation is as follows:

1. The router evaluates the ACI/ARI information configured for the **any** service entry, and ignores the contents of the service name tag transmitted by the client.
2. If no match is found for the client information, the router evaluates the ACI/ARI information for the **empty** service entry and the named service entries. If an ACI/ARI pair is not configured for these service entries, the router evaluates the other attributes configured for the **empty** service and named services.
3. If there is still no match for the client information, the router evaluates the other attributes configured for the **any** service entry, and ignores both the ACI/ARI information for the **any** service and the contents of the service name tag transmitted by the client. If the **any** service is configured for the default action, **drop**, the router drops the PADO packet. If the **any** service is configured for a nondefault action (**terminate** or **delay**), the router evaluates the other attributes configured for the **any** service.

**Related
Documentation**

- [Understanding PPPoE Service Name Tables on page 21](#)
- *Benefits of Configuring PPPoE Service Name Tables*
- *Configuring PPPoE Service Name Tables*
- [Example: Configuring a PPPoE Service Name Table for Dynamic Subscriber Interface Creation on page 53](#)
- *PPPoE Overview*

- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

PART 2

Configuration

- [Configuration Overview on page 31](#)
- [Configuration Tasks for Dynamic PPPoE Subscriber Access on page 33](#)
- [Examples on page 51](#)
- [Configuration Statements on page 75](#)

CHAPTER 3

Configuration Overview

- [Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles on page 31](#)

Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles

You can configure dynamic PPP-over-Ethernet (PPPoE) subscriber interfaces by using dynamic profiles. To enable the router to create a dynamic PPPoE subscriber interface on a PPPoE underlying interface, you define the attributes of the PPPoE logical interface in a dynamic profile, and then configure the underlying interface to use the dynamic profile.

To configure a dynamic PPPoE subscriber interface:

1. Configure a dynamic profile to define the attributes of the PPPoE logical interface.
 - To configure a basic dynamic profile for PPPoE subscriber access, see [“Configuring a Basic PPPoE Dynamic Profile” on page 34](#).
 - To configure a dynamic profile for PPPoE with additional options for subscriber access, see [“Configuring a PPPoE Dynamic Profile with Additional Options” on page 36](#).
2. Configure the underlying Ethernet interface to use the dynamic profile for PPPoE.

See [“Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces” on page 38](#).
3. (Optional) Assign a dynamic profile and routing instance to a service name or ACI/ARI pair in a PPPoE service name table to instantiate a dynamic PPPoE subscriber interface based on the information provided by the PPPoE client.

See [“Assigning a Dynamic Profile and Routing Instance to a Service Name or ACI/ARI Pair for Dynamic PPPoE Interface Creation” on page 46](#).
4. (Optional) Verify the dynamic PPPoE configuration by displaying or clearing PPPoE session statistics, and displaying information about the underlying Ethernet interface and PPPoE logical interface.

See [“Verifying and Managing Dynamic PPPoE Configuration” on page 152](#).

Related Documentation

- [Subscriber Interfaces and PPPoE Overview on page 3](#)

- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)
- [Example: Configuring a Dynamic PPPoE Subscriber Interface on a Static Gigabit Ethernet VLAN Interface on page 51](#)
- [Example: Configuring a PPPoE Service Name Table for Dynamic Subscriber Interface Creation on page 53](#)

CHAPTER 4

Configuration Tasks for Dynamic PPPoE Subscriber Access

- [Configuring a Basic PPPoE Dynamic Profile on page 34](#)
- [Configuring a PPPoE Dynamic Profile with Additional Options on page 36](#)
- [Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38](#)
- [Limiting the Maximum Number of PPPoE Sessions on the Underlying Interface on page 41](#)
- [Configuring Lockout of PPPoE Subscriber Sessions on page 43](#)
- [Ignoring DSL Forum VSAs from Directly Connected Devices on page 44](#)
- [Assigning a Dynamic Profile and Routing Instance to a Service Name or ACI/ARI Pair for Dynamic PPPoE Interface Creation on page 46](#)
- [Configuring the PPPoE Family for an Underlying Interface on page 47](#)

Configuring a Basic PPPoE Dynamic Profile

You can configure a basic dynamic profile for PPPoE subscribers that access the network. The dynamic profile defines the attributes of the dynamic PPPoE logical interface, also referred to as a *dynamic PPPoE subscriber interface*.

To provide basic access for PPPoE subscribers, the dynamic profile must provide a minimal configuration for a **pp0** (PPPoE) logical interface that includes the following:

- The logical unit number, represented by the **\$junos-interface-unit** predefined dynamic variable
- The name of the underlying Ethernet interface, represented by the **\$junos-underlying-interface** predefined dynamic variable
- The **server** statement, which configures the router to act as a PPPoE server
- The PPP authentication protocol (PAP or CHAP)
- The unnumbered address for the **inet** (IPv4) or **inet6** (IPv6) protocol family



NOTE: The creation of dynamic PPPoE subscriber interfaces is supported for the **inet** and **inet6** protocol families.

To configure a basic PPPoE dynamic profile:

1. Name the dynamic profile.

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

2. Specify that you want to configure the **pp0** logical interface in the dynamic profile.

```
[edit dynamic-profiles basic-pppoe-profile]
user@host# edit interfaces pp0
```

3. Configure the predefined variable to represent the logical unit number for the **pp0** interface.

You must use the **\$junos-interface-unit** variable instead of the logical unit number for the **unit** statement. The **\$junos-interface-unit** variable is dynamically replaced with the actual unit number supplied by the network when the subscriber logs in.

```
[edit dynamic-profiles basic-pppoe-profile interfaces pp0]
user@host# edit unit $junos-interface-unit
```

4. Configure PPPoE-specific options for the **pp0** interface.

- a. Configure the predefined variable to represent the name of the underlying Ethernet interface on which the router creates the dynamic PPPoE logical interface.

You must use the **\$junos-underlying-interface** variable instead of the underlying interface name for the **underlying-interface** statement. The **\$junos-underlying-interface** variable is dynamically replaced with the actual name of the underlying interface supplied by the network when the subscriber logs in.


```
[edit dynamic-profiles basic-pppoe-profile interfaces pp0 unit
"$junos-interface-unit"]
user@host# set pppoe-options underlying-interface $junos-underlying-interface
```

- b. Configure the router to act as a PPPoE server, also known as a remote access concentrator.

```
[edit dynamic-profiles basic-pppoe-profile interfaces pp0 unit
"$junos-interface-unit"]
user@host# set pppoe-options server
```

5. Configure the PPP authentication protocol for the **pp0** interface.

For dynamic interfaces, the router supports only unidirectional authentication; that is, the router always functions as the authenticator. When you configure PPP authentication in a dynamic profile, the **chap** and **pap** statements do not support any additional configuration options.

- To configure CHAP authentication:

```
[edit dynamic-profiles basic-pppoe-profile interfaces pp0 unit "$junos-interface-unit"]
user@host# set ppp-options chap
```

- To configure PAP authentication:

```
[edit dynamic-profiles basic-pppoe-profile interfaces pp0 unit "$junos-interface-unit"]
user@host# set ppp-options pap
```

6. Configure the protocol family for the **pp0** interface.

- a. Specify that you want to configure the **inet** (IPv4) or **inet6** (IPv6) protocol family.

```
[edit dynamic-profiles basic-pppoe-profile interfaces pp0 unit
"$junos-interface-unit"]
user@host# edit family inet
```

- b. Configure the unnumbered address for the protocol family.

```
[edit dynamic-profiles basic-pppoe-profile interfaces pp0 unit "$junos-interface-unit"
family inet]
user@host# set unnumbered-address lo0.0
```

Related Documentation

- [Subscriber Interfaces and PPPoE Overview on page 3](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)
- [Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38](#)
- [Example: Configuring a Dynamic PPPoE Subscriber Interface on a Static Gigabit Ethernet VLAN Interface on page 51](#)
- [Verifying and Managing Dynamic PPPoE Configuration on page 152](#)

Configuring a PPPoE Dynamic Profile with Additional Options

You can configure a dynamic profile for PPPoE that has additional options for subscriber access. All of these optional statements, with the exception of the **keepalives** and **no-keepalives** statements, are configured at the **[edit dynamic-profiles *profile-name* interfaces pp0 unit "\$junos-interface-unit" family *family*]** hierarchy level. The **keepalives** and **no-keepalives** statements are configured at the **[edit dynamic-profiles *profile-name* interfaces pp0 unit "\$junos-interface-unit"]** hierarchy level.

The additional options for PPPoE subscriber access in a dynamic profile can include one or more of the following:

- The keepalive interval (**keepalives**), or the option to disable sending keepalive messages (**no-keepalives**)
- The IPv4 or IPv6 address of the dynamic PPPoE logical interface (**address**)
- Definition of the service sets and filters to be applied to the dynamic PPPoE logical interface, configured at the **[edit dynamic-profiles *profile-name* interfaces pp0 unit "\$junos-interface-unit" family *family* service]** hierarchy level
- Association of an input and output filter to the dynamic PPPoE logical interface, configured at the **[edit dynamic-profiles *profile-name* interfaces pp0 unit "\$junos-interface-unit" family *family* filter]** hierarchy level



NOTE: The creation of dynamic PPPoE subscriber interfaces is supported for the **inet** and **inet6** protocol families.

Before you begin:

- Configure a basic PPPoE dynamic profile.

See [“Configuring a Basic PPPoE Dynamic Profile” on page 34](#).

To configure a PPPoE dynamic profile with additional options for subscriber access:

1. Modify the keepalive interval, or configure the router to disable sending keepalive messages.
 - To modify the keepalive interval:

```
[edit dynamic-profiles business-pppoe-profile interfaces pp0 unit "$junos-interface-unit"]
user@host# set keepalives interval 15
```
 - To disable sending keepalive messages:

```
[edit dynamic-profiles business-pppoe-profile interfaces pp0 unit "$junos-interface-unit"]
user@host# set no-keepalives
```
2. Specify that you want to configure the **inet** (IPv4) or **inet6** (IPv6) protocol family.

```
[edit dynamic-profiles business-pppoe-profile interfaces pp0 unit
"$junos-interface-unit"]
user@host# edit family inet
```

3. Specify the IPv4 or IPv6 address of the dynamic PPPoE logical interface.

```
[edit dynamic-profiles business-pppoe-profile interfaces pp0 unit
"$junos-interface-unit" family inet]
user@host# set address 6.6.6.7/32
```

4. Specify the input and output service sets that you want to apply to the dynamic PPPoE logical interface.

```
[edit dynamic-profiles business-pppoe-profile interfaces pp0 unit
"$junos-interface-unit" family inet]
user@host# set service input service-set inputService_100
user@host# set service input post-service-filter postService_20
user@host# set service output service-set outputService_200
```

5. Specify the input and output filters that you want to apply to the dynamic PPPoE logical interface.

To control the order in which filters are processed, you can optionally specify a precedence value for the input filter, output filter, or both.

```
[edit dynamic-profiles business-pppoe-profile interfaces pp0 unit
"$junos-interface-unit" family inet]
user@host# set filter input pppoe-input-filter
user@host# set filter output pppoe-output-filter precedence 50
```

Related Documentation

- [Subscriber Interfaces and PPPoE Overview on page 3](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)
- [Configuring a Basic PPPoE Dynamic Profile on page 34](#)
- [Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38](#)
- [Example: Configuring a Dynamic PPPoE Subscriber Interface on a Static Gigabit Ethernet VLAN Interface on page 51](#)
- [Verifying and Managing Dynamic PPPoE Configuration on page 152](#)
- [Dynamic Service Sets Overview](#)
- [Associating Service Sets with Interfaces in a Dynamic Profile](#)
- [Dynamic Firewall Filters Overview](#)
- [Dynamically Attaching Statically Created Filters for a Specific Interface Family Type](#)

Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces

After you configure a dynamic profile to define the attributes of a dynamic PPPoE subscriber interface, you must attach the dynamic profile to a statically created underlying Ethernet interface configured with PPPoE (**ppp-over-ether**) encapsulation. You configure the underlying interface at the **[edit interfaces *interface-name* unit *logical-unit-number* pppoe-underlying-options]** hierarchy level.

In addition to attaching the dynamic profile to the interface by using the required **dynamic-profile** statement, you can also configure the underlying interface with one or more of the following optional PPPoE-specific attributes:

- Prevention of another dynamic PPPoE logical interface from being activated on the underlying interface when a PPPoE logical interface for a client with the same MAC address is already active on that interface (**duplicate-protection**)
- Maximum number of dynamic PPPoE logical interfaces (sessions) that the router can activate on the underlying interface on a per-interface basis (using the **max-sessions** statement) or on a per-subscriber basis (using the Max-Clients-Per-Interface Juniper Networks VSA [26-143])
- Lockout of failed or short-lived (also known as short-cycle) PPPoE subscriber sessions to prevent reconnection to the router for a default or configurable period of time (**short-cycle-protection**)
- An alternative access concentrator name in the AC-NAME tag in a PPPoE control packet (**access-concentrator**)
- Ability to ignore DSL Forum VSAs received in PPPoE control packets when the router is directly connected to a CPE device (**direct-connect**).

Before you begin:

1. Configure the static underlying Ethernet interface on which you want the router to dynamically create the PPPoE logical interface.

For information about configuring static Ethernet interfaces, see *Configuring Ethernet Physical Interface Properties*.

2. Configure a PPPoE dynamic profile in either of the following ways:
 - To configure a basic PPPoE dynamic profile, see [“Configuring a Basic PPPoE Dynamic Profile” on page 34](#).
 - To configure a PPPoE dynamic profile with additional options for subscriber access, see [“Configuring a PPPoE Dynamic Profile with Additional Options” on page 36](#).

To configure an underlying Ethernet interface for a dynamic PPPoE subscriber interface:

1. Specify the name and logical unit number of the static underlying Ethernet interface to which you want to attach the PPPoE dynamic profile.

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

2. Configure PPPoE encapsulation on the underlying interface.

```
[edit interfaces ge-1/0/1 unit 0]
user@host# set encapsulation ppp-over-ether
```

3. Specify that you want to configure PPPoE-specific options on the underlying interface.

```
[edit interfaces ge-1/0/1 unit 0]
user@host# edit pppoe-underlying-options
```

4. Attach a previously configured PPPoE dynamic profile to the underlying interface.

The specified PPPoE dynamic profile must already be configured on the router. In addition, you cannot attach a PPPoE dynamic profile to an underlying Ethernet interface that is already associated with static PPPoE logical interfaces. Conversely, you cannot associate static PPPoE logical interfaces with an underlying Ethernet interface that already has a PPPoE dynamic profile attached.

```
[edit interfaces ge-1/0/1 unit 0 pppoe-underlying-options]
user@host# set dynamic-profile basic-pppoe-profile
```

5. (Optional) Enable duplicate protection to prevent activation of another dynamic PPPoE logical interface for the same client on the underlying interface.

```
[edit interfaces ge-1/0/1 unit 0 pppoe-underlying-options]
user@host# set duplicate-protection
```

6. (Optional) Configure the maximum number of concurrent PPPoE sessions that the router can activate on the underlying interface in either of the following ways:

- To configure the maximum number of concurrent PPPoE sessions on a per-interface basis, from 1 to the platform-specific default for your router, use the **max-sessions** statement:

```
[edit interfaces ge-1/0/1 unit 0 pppoe-underlying-options]
user@host# set max-sessions 20
```

- To configure the maximum number of concurrent PPPoE sessions on a per-subscriber basis, use the value returned by RADIUS in the Max-Clients-Per-Interface Juniper Networks vendor-specific attribute (VSA) [26-143]. By default, the PPPoE maximum session value returned by RADIUS in the Max-Clients-Per-Interface VSA takes precedence over the PPPoE maximum session value configured with the **max-sessions** statement.

7. (Optional) Configure the router to ignore the value returned by RADIUS in the Max-Clients-Per-Interface VSA and restore the PPPoE maximum session value on the underlying interface to the value configured in the CLI with the **max-sessions** statement.

```
[edit interfaces ge-1/0/1 unit 0 pppoe-underlying-options]
user@host# set max-sessions-vsa-ignore
```

8. (Optional) Enable PPPoE subscriber session lockout on the PPPoE underlying interface in either of the following ways:

- To configure PPPoE subscriber session lockout with the default lockout period:

```
[edit interfaces interface-name unit logical-unit-number pppoe-underlying-options]
user@host# set short-cycle-protection
```

- To configure PPPoE subscriber session lockout with a nondefault lockout period:

```
[edit interfaces interface-name unit logical-unit-number pppoe-underlying-options]  
user@host# set short-cycle-protection lockout-time-min minimum-seconds  
lockout-time-max maximum-seconds
```



BEST PRACTICE: When you configure PPPoE subscriber session lockout, we recommend that you also enable duplicate protection to ensure that the MAC source address for each PPPoE session is unique on the underlying interface.

9. (Optional) Specify the alternative name for the access concentrator, also known as the PPPoE server.

```
[edit interfaces ge-1/0/1 unit 0 pppoe-underlying-options]  
user@host# set access-concentrator server-east
```

10. (Optional) Specify that DSL Forum VSAs received on the interface are ignored; use when the CPE device is directly connected to the router.

```
[edit interfaces ge-1/0/1 unit 0 pppoe-underlying-options]  
user@host# set direct-connect
```

Related Documentation

- [Subscriber Interfaces and PPPoE Overview on page 3](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)
- [Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles on page 31](#)
- [Configuring the PPPoE Family for an Underlying Interface on page 47](#)
- [Configuring Lockout of PPPoE Subscriber Sessions on page 43](#)
- [Verifying and Managing Dynamic PPPoE Configuration on page 152](#)
- [Example: Configuring a Dynamic PPPoE Subscriber Interface on a Static Gigabit Ethernet VLAN Interface on page 51](#)
- [Configuring Ethernet Physical Interface Properties](#)

Limiting the Maximum Number of PPPoE Sessions on the Underlying Interface

You can limit the maximum number of concurrent static or dynamic PPPoE logical interfaces (sessions) that the router can activate on the PPPoE underlying interface, or the maximum number of active static or dynamic PPPoE sessions that the router can establish with a particular service entry in a PPPoE service name table.

You can configure the PPPoE maximum session limit in either of the following ways:

- On a per-interface basis, by using the **max-sessions** CLI statement.
- (Default) On a per-subscriber basis, by using the value returned by RADIUS in the Max-Clients-Per-Interface Juniper Networks vendor-specific attribute (VSA) [26-143]. By default, the PPPoE maximum session value returned by RADIUS in the Max-Clients-Per-Interface VSA takes precedence over the PPPoE maximum session value configured with the **max-sessions** statement.

Optionally, you can configure the router to ignore the PPPoE maximum session value returned by RADIUS in the Max-Clients-Per-Interface VSA by including the **max-sessions-vsa-ignore** statement in your configuration. Using the **max-sessions-vsa-ignore** statement restores the PPPoE maximum session value on the underlying interface to the value configured in the CLI with the **max-sessions** statement.

Before you begin:

- Configure the PPPoE underlying interface.

To configure the underlying interface for use with a PPPoE dynamic profile, see [“Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces” on page 38](#).

To configure the PPPoE family for an underlying interface, see [“Configuring the PPPoE Family for an Underlying Interface” on page 47](#).

To configure the PPPoE maximum session limit:

1. Specify that you want to configure PPPoE-specific options on the underlying interface:

- For a PPPoE family in a dynamic profile for a VLAN demultiplexing (demux) logical interface:

```
[edit dynamic-profiles profile-name interfaces demux0 unit logical-unit-number]
user@host# edit family pppoe
```

- For a PPPoE family in a dynamic profile:

```
[edit dynamic-profiles profile-name interfaces interface-name unit logical-unit-number]
user@host# edit family pppoe
```

- For a PPPoE underlying interface in a dynamic profile:

```
[edit dynamic-profiles profile-name interfaces interface-name unit logical-unit-number]
user@host# edit pppoe-underlying-options
```

- For a PPPoE family on an underlying interface:

```
[edit interfaces interface-name unit logical-unit-number]
user@host# edit family pppoe
```

- For an underlying interface with PPPoE encapsulation:

```
[edit interfaces interface-name unit logical-unit-number]
user@host# edit pppoe-underlying-options
```

- For an underlying interface established with a particular service entry in a PPPoE service name table:

```
[edit protocols pppoe service-name-tables table-name]
user@host# edit service service-name
```

2. Configure the maximum number of concurrent PPPoE sessions that the router can activate on the underlying interface in either of the following ways:

- To configure the maximum number of concurrent PPPoE sessions on a per-interface basis, from 1 to the platform-specific default for your router, use the **max-sessions** statement:

```
[edit interfaces interface-name unit logical-unit-number pppoe-underlying-options]
user@host# set max-sessions number
```

- To configure the maximum number of concurrent PPPoE sessions on a per-subscriber basis, use the value returned by RADIUS in the Max-Clients-Per-Interface Juniper Networks vendor-specific attribute (VSA) [26-143]. By default, the PPPoE maximum session value returned by RADIUS in the Max-Clients-Per-Interface VSA takes precedence over the PPPoE maximum session value configured with the **max-sessions** statement.

3. (Optional) To restore the PPPoE maximum session value on the underlying interface to the value configured in the CLI with the **max-sessions** statement, configure the router to ignore the value returned by RADIUS in the Max-Clients-Per-Interface VSA.

```
[edit interfaces interface-name unit logical-unit-number pppoe-underlying-options]
user@host# set max-sessions-vsa-ignore
```



NOTE: You can issue the **max-sessions-vsa-ignore** statement at the same hierarchy levels as the **max-sessions** statement, with the exception of the **[edit protocols pppoe service-name-tables *table-name* service *service-name*]** hierarchy level.

Related Documentation

- [PPPoE Maximum Session Limit Overview on page 10](#)
- [Guidelines for Using PPPoE Maximum Session Limit from RADIUS on page 12](#)
- [Juniper Networks VSAs Supported by the AAA Service Framework](#)
- [Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38](#)
- [Configuring the PPPoE Family for an Underlying Interface on page 47](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

Configuring Lockout of PPPoE Subscriber Sessions

You can configure the router to temporarily prevent (lock out) a failed or short-lived PPPoE subscriber session from reconnecting to the router for a default or configurable period of time. Configuring a lockout period on the PPPoE underlying interface for static or dynamic PPPoE subscriber sessions protects the router and any external authentication, authorization, and accounting (AAA) servers, such as RADIUS, from excessive loading as a result of failed or short-lived (also known as short-cycle) PPPoE subscriber sessions that occur repeatedly for the same subscriber.

You can configure the router to use the default PPPoE lockout period, 1 through 300 seconds (5 minutes). Alternatively, you can override the default lockout period by specifying a minimum lockout time and maximum lockout time, each of which can be from 1 through 86,400 seconds (24 hours).

Before you begin:

- Configure the PPPoE underlying interface.

To configure the underlying interface for use with a PPPoE dynamic profile, see [“Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces” on page 38](#).

To configure the PPPoE family for an underlying interface, see [“Configuring the PPPoE Family for an Underlying Interface” on page 47](#).

To configure temporary lockout of PPPoE subscriber sessions:

1. Specify that you want to configure PPPoE-specific options on the underlying interface:

- For a PPPoE family in a dynamic profile for a VLAN demultiplexing (demux) logical interface:

```
[edit dynamic-profiles profile-name interfaces demux0 unit logical-unit-number]
user@host# edit family pppoe
```

- For a PPPoE family in a dynamic profile:

```
[edit dynamic-profiles profile-name interfaces interface-name unit logical-unit-number]
user@host# edit family pppoe
```

- For a PPPoE underlying interface in a dynamic profile:

```
[edit dynamic-profiles profile-name interfaces interface-name unit logical-unit-number]
user@host# edit pppoe-underlying-options
```

- For a PPPoE family on an underlying interface:

```
[edit interfaces interface-name unit logical-unit-number]
user@host# edit family pppoe
```

- For an underlying interface with PPPoE encapsulation:

```
[edit interfaces interface-name unit logical-unit-number]
user@host# edit pppoe-underlying-options
```

2. Enable duplicate protection to prevent negotiation of a dynamic or static PPPoE client session on the same underlying interface when a PPPoE client session with the same media access control (MAC) source address is already active on that interface.

```
[edit interfaces interface-name unit logical-unit-number pppoe-underlying-options]
user@host# set duplicate-protection
```



BEST PRACTICE: When you configure PPPoE subscriber session lockout, we recommend that you enable duplicate protection to ensure that the MAC source address for each PPPoE session is unique on the underlying interface.

3. Enable PPPoE subscriber session lockout on the PPPoE underlying interface in either of the following ways:

- To configure PPPoE subscriber session lockout with the default lockout period:

```
[edit interfaces interface-name unit logical-unit-number pppoe-underlying-options]
user@host# set short-cycle-protection
```

- To configure PPPoE subscriber session lockout with a nondefault lockout period:

```
[edit interfaces interface-name unit logical-unit-number pppoe-underlying-options]
user@host# set short-cycle-protection lockout-time-min minimum-seconds
lockout-time-max maximum-seconds
```

Related Documentation

- [PPPoE Subscriber Session Lockout Overview on page 13](#)
- [Clearing Lockout of PPPoE Subscriber Sessions on page 151](#)
- [Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38](#)
- [Configuring the PPPoE Family for an Underlying Interface on page 47](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

Ignoring DSL Forum VSAs from Directly Connected Devices

When CPE devices are directly connected to a BNG, you may want the router to ignore any DSL Forum VSAs that it receives in PPPoE control packets because the VSAs can be spoofed by malicious subscribers. Spoofing is particularly serious when the targeted VSAs are used to authenticate the subscriber, such as Agent-Circuit-Id [26-1] and Agent-Remote-ID [26-2]. You can include the **direct-connect** statement to ignore DSL Forum VSAs on static or dynamic PPPoE interfaces or PPPoE underlying interfaces.

To configure the router to ignore DSL Forum VSAs on specific PPPoE interfaces:

1. Specify that you want to configure PPPoE-specific options on the interface:
 - For a PPPoE family in a dynamic profile for a VLAN demultiplexing (demux) logical interface:

```
[edit dynamic-profiles profile-name interfaces demux0 unit logical-unit-number]
user@host# edit family pppoe
```

- For a PPPoE family in a dynamic profile:

```
[edit dynamic-profiles profile-name interfaces interface-name unit logical-unit-number]
user@host# edit family pppoe
```

- For a PPPoE underlying interface in a dynamic profile:

```
[edit dynamic-profiles profile-name interfaces interface-name unit logical-unit-number]
user@host# edit pppoe-underlying-options
```

- For a PPPoE family on an underlying interface:

```
[edit interfaces interface-name unit logical-unit-number]
user@host# edit family pppoe
```

- For an underlying interface with PPPoE encapsulation:

```
[edit interfaces interface-name unit logical-unit-number]
user@host# edit pppoe-underlying-options
```

2. Specify that the router ignores DSL forum VSAs received on a specific interface.

```
[edit ... family pppoe]
user@host# set direct-connect
```

or

```
[edit ... pppoe-underlying-options]
user@host# set direct-connect
```

Related Documentation

- [Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38](#)
- [Configuring the PPPoE Family for an Underlying Interface on page 47](#)

Assigning a Dynamic Profile and Routing Instance to a Service Name or ACI/ARI Pair for Dynamic PPPoE Interface Creation

You can create a dynamic PPPoE subscriber interface based on the service name, agent circuit identifier (ACI), and agent remote identifier (ARI) information provided by the PPPoE client during PPPoE negotiation. To do so, you assign a previously configured PPPoE dynamic profile to a named service, **empty** service, or **any** service entry in a PPPoE service name table, or to an ACI/ARI pair defined for these services.

Similarly, to specify the routing instance in which to instantiate the dynamic PPPoE subscriber interface, you can assign a previously configured routing instance to a named service, **empty** service, or **any** service in a PPPoE service name table, or to an ACI/ARI pair defined for these services.

Observe the following configuration guidelines when you assign a dynamic profile and routing instance to a PPPoE service name table to create a dynamic PPPoE subscriber interface:

- The dynamic profile and routing instance must already be configured on the router.
- The dynamic profile or routing instance assigned to the PPPoE service name table overrides the dynamic profile or routing instance assigned to the PPPoE underlying interface on which the dynamic subscriber interface is created.
- You cannot configure a dynamic profile or routing instance for an ACI/ARI pair already configured with a static interface (by using the **static-interface** statement). Conversely, you cannot configure a static interface for an ACI/ARI pair already configured with a dynamic profile or routing instance.

Before you begin:

1. Configure a PPPoE dynamic profile in either of the following ways:
 - To configure a basic PPPoE dynamic profile, see [“Configuring a Basic PPPoE Dynamic Profile” on page 34](#).
 - To configure a PPPoE dynamic profile with additional options for subscriber access, see [“Configuring a PPPoE Dynamic Profile with Additional Options” on page 36](#).
2. Configure the routing instance in which you want the router to instantiate the dynamic profile.

For information about configuring routing instances, see *Routing Instances Overview*.
3. Create the PPPoE service name table on the router.

See *Creating a Service Name Table*.

To create a dynamic PPPoE subscriber interface based on the service name and, optionally, associated ACI/ARI pair configured in a PPPoE service name table, do one of the following:

- Assign a previously configured dynamic profile and routing instance to a named, **empty**, or **any** service.

```
[edit protocols pppoe service-name-tables table1]
user@host# set service premium dynamic-profile premiumProfile routing-instance
premiumRI
```

- Assign a previously configured dynamic profile and routing instance to the ACI/ARI pair defined for a named, **empty**, or **any** service.

```
[edit protocols pppoe service-name-tables table1]
user@host# set service any agent-specifier aci west-ge-3/0/3 ari sunnyvale
dynamic-profile standardProfile routing-instance standardRI
```

Related Documentation

- [Example: Configuring a PPPoE Service Name Table for Dynamic Subscriber Interface Creation on page 53](#)
- [Subscriber Interfaces and PPPoE Overview on page 3](#)
- [Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles on page 31](#)
- [Configuring PPPoE Service Name Tables](#)

Configuring the PPPoE Family for an Underlying Interface

You can configure the PPPoE family on an underlying interface as an alternative to configuring PPPoE encapsulation on that interface. You cannot configure both on the same interface. You can configure the same attributes for the PPPoE family as you can for an interface configured with **pppoe-underlying-options**.

Before you begin, configure the underlying interface. When you want to configure PPPoE on an aggregated Ethernet bundle, you must configure the PPPoE family over a VLAN demux interface as an intermediate underlying option. The VLAN demux interface can be static or dynamic.

The following topics describe how to configure basic static and dynamic interfaces:

- [Configuring a Subscriber Interface with a Static VLAN Interface](#)
- [Configuring Static Subscriber Interfaces Using VLAN Demux Interfaces](#)
- [Configuring Dynamic Subscriber Interfaces Using VLAN Demux Interfaces in Dynamic Profiles](#)

To configure the PPPoE family over an underlying interface:

1. Specify the PPPoE family.

```
[edit interfaces demux0 unit logical-unit-number]
user@host# set family pppoe
```

2. (Optional) Configure an alternative access concentrator name to be used instead of the system name in PPPoE control packets for the dynamic PPPoE subscriber interface.

```
[edit interfaces demux0 unit logical-unit-number family pppoe]
user@host# set access-concentrator name
```

3. (Optional) Configure duplicate protection to prevent 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.

```
[edit interfaces demux0 unit logical-unit-number family pppoe]
user@host# set duplicate-protection
```

4. (Optional) Attach a dynamic profile to determine the properties of the dynamic PPPoE logical interface when it is created.

```
[edit interfaces demux0 unit logical-unit-number family pppoe]
user@host# set dynamic-profile profile-name
```

5. (Optional) Configure the maximum number of concurrent PPPoE sessions that the router can activate on the underlying interface in either of the following ways:

- To configure the maximum number of concurrent PPPoE sessions on a per-interface basis, from 1 through the platform-specific default for your router, use the **max-sessions** statement:

```
[edit interfaces demux0 unit logical-unit-number family pppoe]
user@host# set max-sessions number
```

- To configure the maximum number of concurrent PPPoE sessions on a per-subscriber basis, use the value returned by RADIUS in the Max-Clients-Per-Interface Juniper Networks vendor-specific attribute (VSA) [26-143]. By default, the PPPoE maximum session value returned by RADIUS in the Max-Clients-Per-Interface VSA takes precedence over the PPPoE maximum session value configured with the **max-sessions** statement.

6. (Optional) Configure the router to ignore the value returned by RADIUS in the Max-Clients-Per-Interface VSA and restore the PPPoE maximum session value on the underlying interface to the value configured in the CLI with the **max-sessions** statement.

```
[edit interfaces demux0 unit logical-unit-number family pppoe]
user@host# set max-sessions-vsa-ignore
```

7. (Optional) Enable PPPoE subscriber session lockout on the PPPoE underlying interface in either of the following ways:

- To configure PPPoE subscriber session lockout with the default lockout period:

```
[edit interfaces interface-name unit logical-unit-number pppoe-underlying-options]
user@host# set short-cycle-protection
```

- To configure PPPoE subscriber session lockout with a nondefault lockout period:

```
[edit interfaces interface-name unit logical-unit-number pppoe-underlying-options]
user@host# set short-cycle-protection lockout-time-min minimum-seconds
lockout-time-max maximum-seconds
```



BEST PRACTICE: When you configure PPPoE subscriber session lockout, we recommend that you also enable duplicate protection to ensure that the MAC source address for each PPPoE session is unique on the underlying interface.

8. (Optional) Specify the service name table assigned to the underlying interface.

```
[edit interfaces demux0 unit logical-unit-number family pppoe]  
user@host# set service-name-table table-name
```

9. (Optional) Specify that DSL Forum VSAs received on the interface are ignored; use when the CPE device is directly connected to the router.

```
[edit interfaces demux0 unit logical-unit-number family pppoe]  
user@host# set direct-connect
```

**Related
Documentation**

- *Static or Dynamic Demux Subscriber Interfaces over Aggregated Ethernet Overview*
- [Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38](#)
- [Configuring Lockout of PPPoE Subscriber Sessions on page 43](#)
- [Example: Configuring a Static PPPoE Subscriber Interface on a Static Underlying VLAN Demux Interface over Aggregated Ethernet on page 56](#)
- [Example: Configuring a Dynamic PPPoE Subscriber Interface on a Static Underlying VLAN Demux Interface over Aggregated Ethernet on page 62](#)
- [Example: Configuring a Dynamic PPPoE Subscriber Interface on a Dynamic Underlying VLAN Demux Interface over Aggregated Ethernet on page 67](#)

CHAPTER 5

Examples

- [Example: Configuring a Dynamic PPPoE Subscriber Interface on a Static Gigabit Ethernet VLAN Interface on page 51](#)
- [Example: Configuring a PPPoE Service Name Table for Dynamic Subscriber Interface Creation on page 53](#)
- [Example: Configuring a Static PPPoE Subscriber Interface on a Static Underlying VLAN Demux Interface over Aggregated Ethernet on page 56](#)
- [Example: Configuring a Dynamic PPPoE Subscriber Interface on a Static Underlying VLAN Demux Interface over Aggregated Ethernet on page 62](#)
- [Example: Configuring a Dynamic PPPoE Subscriber Interface on a Dynamic Underlying VLAN Demux Interface over Aggregated Ethernet on page 67](#)

Example: Configuring a Dynamic PPPoE Subscriber Interface on a Static Gigabit Ethernet VLAN Interface

This example shows how to configure a dynamic PPPoE subscriber interface on a statically configured Gigabit Ethernet VLAN underlying interface. When a PPPoE subscriber logs in on the underlying interface, the router creates the dynamic PPPoE subscriber interface with the attributes specified in the dynamic profile.

In this example, the dynamic PPPoE profile, **pppoe-profile-east**, defines options for PPPoE subscribers accessing the network, and includes the predefined dynamic variables **\$junos-interface-unit**, which represents the logical unit number of the dynamic PPPoE logical interface, and **\$junos-underlying-interface**, which represents the name of the underlying Ethernet interface. The **pppoe-profile-east** dynamic profile is assigned to the underlying Ethernet VLAN interface **ge-2/0/3.1** that is configured with PPPoE (**ppp-over-ether**) encapsulation.

When the router dynamically creates the PPPoE subscriber interface on **ge-2/0/3.1** in response to a subscriber login, the values of **\$junos-interface-unit** and **\$junos-underlying-interface** are dynamically replaced with the actual logical unit number and interface name, respectively, that are supplied by the network when the PPPoE subscriber logs in.

To configure a dynamic PPPoE subscriber interface:

1. Configure a dynamic profile to define the attributes of the dynamic PPPoE subscriber interface.

```
[edit]
dynamic-profiles {
  pppoe-profile-east {
    interfaces {
      pp0 {
        unit "$junos-interface-unit" {
          ppp-options {
            chap;
          }
          pppoe-options {
            underlying-interface "$junos-underlying-interface";
            server;
          }
          keepalives interval 30;
          family inet {
            filter {
              input pppoe-input-filter-east;
              output pppoe-output-filter-east precedence 20;
            }
            service {
              input {
                service-set inputService-east;
                post-service-filter postService-east;
              }
              output {
                service-set outputService-east;
              }
            }
            address 6.6.6.1/32;
            unnumbered-address lo0.0;
          }
        }
      }
    }
  }
}
```

2. Assign the dynamic PPPoE profile to the static underlying Ethernet interface, and define PPPoE-specific attributes for the underlying interface.

```
[edit]
interfaces {
  ge-2/0/3 {
    vlan-tagging;
    unit 1 {
      encapsulation ppp-over-ether;
      vlan-id 100;
      pppoe-underlying-options {
        access-concentrator server-east;
        duplicate-protection;
        dynamic-profile pppoe-profile-east;
      }
    }
  }
}
```

```

        max-sessions 10;
    }
}
}

```

**Related
Documentation**

- [Subscriber Interfaces and PPPoE Overview on page 3](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)
- [Configuring a PPPoE Dynamic Profile with Additional Options on page 36](#)
- [Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38](#)

Example: Configuring a PPPoE Service Name Table for Dynamic Subscriber Interface Creation

This example shows how to configure a PPPoE service name table to create a dynamic PPPoE subscriber interface based on the service name, agent circuit identifier (ACI), and agent remote identifier (ARI) information provided by PPPoE clients during PPPoE negotiation.

In this example, PPPoE service name table **TableDynamicPPPoE** includes an **any** service entry, **empty** service entry, and two named service entries: **Premium** and **Standard**. The PPPoE underlying interfaces configured for **TableDynamicPPPoE** are **ge-2/0/0.1** and **ge-2/0/0.2**. Only **ge-2/0/0.1** is configured for dynamic profile assignment and creation of dynamic PPPoE subscriber interfaces.

Following the configuration example, [Table 4 on page 55](#) explains how the router evaluates the entries in **TableDynamicPPPoE** to create a dynamic PPPoE subscriber interface in a specified routing instance for each of several sample clients.

To configure a PPPoE service name table to create dynamic PPPoE subscriber interfaces:

1. Configure the PPPoE service name table.

```

protocols {
  pppoe {
    service-name-tables TableDynamicPPPoE {
      service any {
        terminate;
        max-sessions 100;
        dynamic-profile AnyProfile;
      }
      agent-specifier {
        aci "broadway-ge-1/0/1.0" ari "london" {
          terminate;
          dynamic-profile LondonProfile;
          routing-instance LondonRI;
        }
        aci "groton-ge-4/0/3.32" ari "paris" {
          delay 5;
          dynamic-profile ParisProfile;
        }
      }
    }
  }
}

```

```

        routing-instance ParisRI;
    }
}
}
service empty {
    drop;
    agent-specifier {
        aci "dunstable-ge-1/0/0.1" ari "kanata" {
            dynamic-profile BasicPppoeProfile;
            delay 10;
        }
    }
}
service Premium {
    terminate;
    dynamic-profile PremiumProfile;
}
service Standard {
    terminate;
    max-sessions 10;
    dynamic-profile StandardProfile;
    agent-specifier {
        aci "dunstable-ge-1/0/0.1" ari "kanata" {
            dynamic-profile BasicPppoeProfile;
            delay 10;
        }
    }
}
}
}
}
}
}
}

```

2. Configure the PPPoE underlying interface for the service name table.

```

interfaces {
    ge-2/0/0 {
        vlan-tagging;
        unit 1 {
            vlan-id 1;
            pppoe-underlying-options {
                dynamic-profile BasicPppoeProfile;
                service-name-table TableDynamicPPPoE;
            }
        }
        unit 2 {
            vlan-id 2;
            pppoe-underlying-options {
                service-name-table TableDynamicPPPoE;
            }
        }
    }
}
}

```

Table 4 on page 55 lists the service name, ACI value, and ARI value provided in several sample PPPoE client requests, and the name of the PPPoE underlying interface on which the router received each client request. The Results column describes the dynamic PPPoE subscriber interface created by the router based on *both* of the following:

- The values received from each PPPoE client during PPPoE negotiation
- The sequence in which the router evaluates the entries configured in the PPPoE service name table to find a match for the client's service name and ACI/ARI information, as described in “Evaluation Order for Matching Client Information in PPPoE Service Name Tables” on page 26

Table 4: Dynamic PPPoE Subscriber Interface Creation Based on PPPoE Client Request Values

PPPoE Client	Service Name	ACI Value	ARI Value	Receiving Underlying Interface	Results
Client 1	Premium	broadway-ge-1/0/1.1	london	ge-2/0/0.1	Matches ACI/ARI pair configured for any service. Router creates dynamic PPPoE subscriber interface over ge-2/0/0.1 using LondonProfile dynamic profile and LondonRI routing instance assigned to any service.
Client 2	Premium	dunstable-ge-1/0/1.0	toronto	ge-2/0/0.1	Matches base Premium service. Router creates dynamic PPPoE subscriber interface over ge-2/0/0.1 using PremiumProfile dynamic profile and routing instance associated with ge-2/0/0.1 underlying interface.
Client 3	empty	dunstable-ge-1/0/0.1	kanata	ge-2/0/0.1	Matches ACI/ARI pair configured for empty service and Standard service. Router creates dynamic PPPoE subscriber interface over ge-2/0/0.1 after a delay of 10 seconds. Router uses BasicPPPoEProfile dynamic profile and routing instance associated with ge-2/0/0.1 underlying interface.
Client 4	empty	slinger-ge-1/0/0.1	chicago	ge-2/0/0.2	Because receiving underlying interface ge-2/0/0.2 is <i>not</i> associated with a dynamic profile, router does not create a dynamic PPPoE subscriber interface, and drops any PADI or PADR control packets received from this client.

Table 4: Dynamic PPPoE Subscriber Interface Creation Based on PPPoE Client Request Values (*continued*)

PPPoE Client	Service Name	ACI Value	ARI Value	Receiving Underlying Interface	Results
Client 5	Standard	slinger-ge-1/0/0.1	chicago	ge-2/0/0.1	Matches base Standard service. Router creates dynamic PPPoE subscriber interface over ge-2/0/0.1 using StandardProfile dynamic profile and routing instance associated with ge-2/0/0.1 underlying interface.

- Related Documentation**
- [Evaluation Order for Matching Client Information in PPPoE Service Name Tables on page 26](#)
 - [Subscriber Interfaces and PPPoE Overview on page 3](#)
 - [Understanding PPPoE Service Name Tables on page 21](#)
 - [Configuring PPPoE Service Name Tables](#)

Example: Configuring a Static PPPoE Subscriber Interface on a Static Underlying VLAN Demux Interface over Aggregated Ethernet

This example shows how you can configure static PPPoE subscriber interfaces over aggregated Ethernet bundles to provide subscriber link redundancy.

- [Requirements on page 56](#)
- [Overview on page 56](#)
- [Configuration on page 57](#)
- [Verification on page 59](#)

Requirements

PPPoE over VLAN demux interfaces over aggregated Ethernet requires the following hardware and software:

- MX Series 3D Universal Edge Routers
- MPCs
- Junos OS Release 11.2 or later

No special configuration beyond device initialization is required before you can configure this feature.

Overview

Aggregated Ethernet bundles enable link redundancy between the router and networking devices connected by Ethernet links. This example describes how to configure link

redundancy for static PPPoE subscribers over aggregated Ethernet interface with an intermediate static VLAN demux interface. Sample tasks include configuring a two-member aggregated Ethernet bundle on **ae0**, configuring a static VLAN demux interface, **demux0.100**, that underlies the PPPoE subscriber interface, **pp0.100**, and configuring the PPPoE subscriber interface including characteristics of the PPPoE family.

This example does not show all possible configuration choices.

Configuration

CLI Quick Configuration To quickly configure link redundancy for static PPPoE subscribers over a static VLAN demux interface over aggregated Ethernet, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

```
[edit]
set chassis aggregated-devices ethernet device-count 1
set interfaces ge-5/0/3 gigether-options 802.3ad ae0
set interfaces ge-5/0/3 gigether-options 802.3ad primary
set interfaces ge-5/1/2 gigether-options 802.3ad ae0
set interfaces ge-5/1/2 gigether-options 802.3ad backup
set interfaces ae0 flexible-vlan-tagging
set interfaces ae0 aggregated-ether-options link-protection
edit interfaces demux0 unit 100
set vlan-id 100
set demux-options underlying-interface ae0
set family pppoe access-concentrator pppoe-server-1
set family pppoe duplicate-protection
set family pppoe max-sessions 16000
top
edit interfaces pp0 unit 100
set pppoe-options underlying-interface demux0.100
set pppoe-options server
set family inet unnumbered-address lo0.0
top
```

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

To configure link redundancy for static PPPoE subscribers over a static VLAN demux interface over aggregated Ethernet:

1. Define the number of aggregated Ethernet devices on the router.

```
[edit chassis]
user@host# set aggregated-devices ethernet device-count 1
```

2. Configure a two-link aggregated Ethernet logical interface to serve as the underlying interface for the static VLAN demux subscriber interface. In this example, the LAG bundle is configured for one-to-one active/backup link redundancy. To support link redundancy at the MPC level, the LAG bundle attaches to ports from two different MPCs.

```
[edit interfaces]
```

```
user@host# set ge-5/0/3 gigether-options 802.3ad ae0
user@host# set ge-5/0/3 gigether-options 802.3ad primary
user@host# set ge-5/1/2 gigether-options 802.3ad ae0
user@host# set ge-5/1/2 gigether-options 802.3ad backup
```

3. Enable link protection on the aggregated Ethernet logical interface and configure support for single and dual (stacked) VLAN tags.

```
[edit interfaces]
user@host# set ae0 aggregated-ether-options link-protection
user@host# set ae0 flexible-vlan-tagging
```

4. Configure the VLAN demux interface over the aggregated Ethernet logical interface.

```
[edit interfaces]
user@host# set demux0 unit 100 vlan-id 100
user@host# set demux0 unit 100 demux-options underlying-interface ae0
```

5. Configure the PPPoE family attributes on the VLAN demux interface.

```
[edit interfaces]
user@host# set demux0 unit 100 family pppoe access-concentrator pppoe-server-1
user@host# set demux0 unit 100 family pppoe duplicate-protection
user@host# set demux0 unit 100 family pppoe max-sessions 16000
```

6. Configure the VLAN demux interface as the underlying interface on which the PPPoE logical interface is created.

```
[edit interfaces]
user@host# set pp0 unit 100 pppoe-options underlying-interface demux0.100
user@host# set pp0 unit 100 pppoe-options server
user@host# set pp0 unit 100 family inet unnumbered-address lo0.0
```

Results From configuration mode, confirm the aggregated device configuration by entering the **show chassis** command. Confirm the interface configuration by entering the **show interfaces** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis
aggregated-devices {
  ethernet {
    device-count 1;
  }
}

[edit]
user@host# show interfaces
ge-5/0/3 {
  gigether-options {
    802.3ad {
      ae0;
      primary;
    }
  }
}
ge-5/1/2 {
  gigether-options {
```



```

    802.3ad {
        ae0;
        backup;
    }
}
ae0 {
    flexible-vlan-tagging;
    aggregated-ether-options {
        link-protection;
    }
}
demux0 {
    unit 100 {
        vlan-id 100;
        demux-options {
            underlying-interface ae0;
        }
        family pppoe {
            access-concentrator pppoe-server-1;
            duplicate-protection;
            max-sessions 16000;
        }
    }
}
pp0 {
    unit 100 {
        pppoe-options {
            underlying-interface demux0.100;
            server;
        }
        family inet {
            unnumbered-address lo0.0;
        }
    }
}

```

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

Verification

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

- [Verifying the Aggregated Ethernet Interface Configuration on page 59](#)
- [Verifying the demux0 Interface Configuration on page 60](#)
- [Verifying the pp0 Interface Configuration on page 61](#)

Verifying the Aggregated Ethernet Interface Configuration

Purpose Verify that the interface values match your configuration, the link is up, and traffic is flowing.

Action From operational mode, enter the **show interfaces redundancy** command.

```
user@host> show interfaces redundancy
Interface State      Last change Primary      Secondary      Current status
ae0       On primary          ge-5/0/3      ge-5/1/2      both up
```

From operational mode, enter the **show interfaces ae0** command.

```
user@host> show interfaces ae0
Physical interface: ae0, Enabled, Physical link is Up
Interface index: 128, SNMP ifIndex: 606
Link-level type: Ethernet, MTU: 1522, Speed: 1Gbps, BPDU Error: None,
MAC-REWRITE Error: None, Loopback: Disabled, Source filtering: Disabled,
Flow control: Disabled, Minimum links needed: 1, Minimum bandwidth needed: 0
Device flags : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Current address: 00:1f:12:b8:ef:c0, Hardware address: 00:1f:12:b8:ef:c0
Last flapped : 2011-03-11 13:24:18 PST (2d 03:34 ago)
Input rate   : 1984 bps (2 pps)
Output rate  : 0 bps (0 pps)

Logical interface ae0.32767 (Index 69) (SNMP ifIndex 709)
Flags: SNMP-Traps 0x4004000 VLAN-Tag [ 0x0000.0 ] Encapsulation: ENET2
Statistics      Packets      pps      Bytes      bps
Bundle:
  Input :      371259      2      46036116      1984
  Output:      0      0      0      0
Protocol multiservice, MTU: Unlimited
Flags: Is-Primary
```

Meaning The **show interfaces redundancy** output shows the redundant link configuration and that both link interfaces are up. The **show interfaces ae0** output shows that the aggregated Ethernet interface is up and that traffic is being received on the logical interface.

Verifying the demux0 Interface Configuration

Purpose Verify that the VLAN demux interface displays the configured PPPoE family attributes and the member links in the aggregated Ethernet bundle.

Action From operational mode, enter the **show interfaces demux0** command.

```
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-5/0/3
  ge-5/1/2
Input packets : 2
Output packets: 18575
Protocol pppoe
Dynamic Profile: none,
Service Name Table: None,
Max Sessions: 16000, Duplicate Protection: On,
AC Name: pppoe-server-1
```

Alternatively, you can enter **show pppoe underlying-interfaces detail** to display the state and PPPoE family configuration for all configured underlying interfaces.

Meaning The output shows the name of the underlying interface, the member links of the aggregated bundle, and the PPPoE family configuration. The output shows packet counts when traffic is present on the logical interface.

Verifying the pp0 Interface Configuration

Purpose Verify that the interface values match your configuration.

Action From operational mode, enter the **show interfaces pp0** command.

```
user@host> show interfaces pp0.100
Logical interface pp0.100 (Index 71) (SNMP ifIndex 710)
Flags: Point-To-Point SNMP-Traps 0x4000 Encapsulation: PPPoE
PPPoE:
  State: SessionUp, Session ID: 1,
  Session AC name: pppoe-server-1, Remote MAC address: 00:90:1a:00:18:34,
  Underlying interface: demux0.100 (Index 70)
Link:
  ge-5/0/3.32767
  ge-5/1/2.32767
Input packets : 18572
Output packets: 18572
Keepalive settings: Interval 10 seconds, Up-count 1, Down-count 3
Keepalive: Input: 0 (never), Output: 18566 (00:00:02 ago)
LCP state: Opened
NCP state: inet: Opened, inet6: Not-configured, iso: Not-configured, mpls:
Not-configured
CHAP state: Closed
PAP state: Success
Protocol inet, MTU: 1500
  Flags: Sendbcst-pkt-to-re
  Addresses, Flags: Is-Primary
    Local: 45.63.24.1
```

Meaning This output shows information about the PPPoE logical interface created on the underlying VLAN demux interface. The output includes the PPPoE family and aggregated Ethernet redundant link information, and shows input and output traffic for the PPPoE interface.

Related Documentation

- *Subscriber Interfaces and Demultiplexing Overview*
- *Static or Dynamic Demux Subscriber Interfaces over Aggregated Ethernet Overview*
- *Configuring Static Subscriber Interfaces Using VLAN Demux Interfaces*
- [Configuring the PPPoE Family for an Underlying Interface on page 47](#)

Example: Configuring a Dynamic PPPoE Subscriber Interface on a Static Underlying VLAN Demux Interface over Aggregated Ethernet

This example shows how you can configure dynamic PPPoE subscriber interfaces over aggregated Ethernet bundles to provide subscriber link redundancy.

- [Requirements on page 62](#)
- [Overview on page 62](#)
- [Configuration on page 63](#)
- [Verification on page 65](#)

Requirements

PPPoE over VLAN demux interfaces over aggregated Ethernet requires the following hardware and software:

- MX Series 3D Universal Edge Routers
- MPCs
- Junos OS Release 11.2 or later

No special configuration beyond device initialization is required before you can configure this feature.

Overview

Aggregated Ethernet bundles enable link redundancy between the router and networking devices connected by Ethernet links. This example describes how to configure link redundancy for dynamic PPPoE subscribers over aggregated Ethernet interface, **ae0**, with an intermediate static VLAN demux interface, **demux0.100**. Sample tasks include configuring a two-member aggregated Ethernet bundle, configuring a static VLAN demux interface that underlies the PPPoE subscriber interface, and configuring the dynamic profile that establishes the dynamic PPPoE subscriber interfaces.

The dynamic PPPoE profile (**pppoe-profile**) creates the PPPoE subscriber interface. It also configures the router to act as a PPPoE server and enables the local address to be derived from the specified address without assigning an explicit IP address to the interface. The **pppoe-profile** dynamic profile is assigned to the static, intermediate VLAN demux interface (**demux0.100**), which is configured with the PPPoE family (**family pppoe**) attributes. This dynamic profile includes the following predefined variables:

- **\$junos-interface-unit**—Represents the logical unit number of the dynamic PPPoE logical interface. This predefined variable is dynamically replaced with the unit number supplied by the router when the subscriber logs in.
- **\$junos-underlying-interface**—Represents the name of the underlying Ethernet interface. This predefined variable is dynamically replaced with the interface name supplied by the router when the subscriber logs in.

This example does not show all possible configuration choices.

Configuration

CLI Quick Configuration To quickly configure link redundancy for dynamic PPPoE subscribers over a static VLAN demux interface over aggregated Ethernet, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

```
[edit]
set chassis aggregated-devices ethernet device-count 1
set interfaces ge-5/0/3 gigether-options 802.3ad ae0
set interfaces ge-5/0/3 gigether-options 802.3ad primary
set interfaces ge-5/1/2 gigether-options 802.3ad ae0
set interfaces ge-5/1/2 gigether-options 802.3ad backup
set interfaces ae0 flexible-vlan-tagging
set interfaces ae0 aggregated-ether-options link-protection
set interfaces demux0 unit 100 vlan-id 100
set interfaces demux0 unit 100 demux-options underlying-interface ae0
set interfaces demux0 unit 100 family pppoe access-concentrator pppoe-server-1
set interfaces demux0 unit 100 family pppoe duplicate-protection
set interfaces demux0 unit 100 family pppoe dynamic-profile pppoe-profile
edit dynamic-profiles pppoe-profile
edit interfaces pp0 unit $junos-interface-unit
set pppoe-options underlying-interface $junos-underlying-interface
set pppoe-options server
set family inet unnumbered-address lo0.0
top
```

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

To configure link redundancy for dynamic PPPoE subscribers over a static VLAN demux interface over aggregated Ethernet:

1. Define the number of aggregated Ethernet devices on the router.

```
[edit chassis]
user@host# set aggregated-devices ethernet device-count 1
```

2. Configure a two-link aggregated Ethernet logical interface to serve as the underlying interface for the static VLAN demux subscriber interface. In this example, the LAG bundle is configured for one-to-one active/backup link redundancy. To support link redundancy at the MPC level, the LAG bundle attaches to ports from two different MPCs.

```
[edit interfaces]
user@host# set ge-5/0/3 gigether-options 802.3ad ae0
user@host# set ge-5/0/3 gigether-options 802.3ad primary
user@host# set ge-5/1/2 gigether-options 802.3ad ae0
user@host# set ge-5/1/2 gigether-options 802.3ad backup
```

3. Enable link protection on the aggregated Ethernet logical interface and configure support for single and dual (stacked) VLAN tags.

```
[edit interfaces]
```

```
user@host# set ae0 aggregated-ether-options link-protection
user@host# set ae0 flexible-vlan-tagging
```

4. Configure the VLAN demux interface over the aggregated Ethernet logical interface.

```
[edit interfaces]
user@host# set demux0 unit 100 vlan-id 100
user@host# set demux0 unit 100 demux-options underlying-interface ae0
```

5. Configure the PPPoE family attributes on the VLAN demux interface, including the dynamic profile.

```
[edit interfaces]
user@host# set demux0 unit 100 family pppoe access-concentrator pppoe-server-1
user@host# set demux0 unit 100 family pppoe duplicate-protection
user@host# set demux0 unit 100 family pppoe dynamic-profile pppoe-profile
```

6. Configure the dynamic profile that creates the PPPoE subscriber interfaces.

```
[edit dynamic-profiles pppoe-profile]
user@host# edit interfaces pp0 unit $junos-interface-unit
[edit dynamic-profiles pppoe-profile interfaces pp0 unit "$junos-interface-unit"]
user@host# set pppoe-options underlying-interface $junos-underlying-interface
user@host# set pppoe-options server
user@host# set family inet unnumbered-address lo0.0
```

Results From configuration mode, confirm the aggregated device configuration by entering the **show chassis** command. Confirm the interface configuration by entering the **show interfaces** command. Confirm the dynamic profile configuration by entering the **show dynamic-profiles** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```
[edit]
user@host# show chassis
aggregated-devices {
  ethernet {
    device-count 1;
  }
}

[edit]
user@host# show interfaces
ge-5/0/3 {
  gether-options {
    802.3ad {
      ae0;
      primary;
    }
  }
}
ge-5/1/2 {
  gether-options {
    802.3ad {
      ae0;
      backup;
    }
  }
}
```

```

}
ae0 {
  flexible-vlan-tagging;
  aggregated-ether-options {
    link-protection;
  }
}
demux0 {
  unit 100 {
    vlan-id 100;
    demux-options {
      underlying-interface ae0;
    }
    family pppoe {
      access-concentrator pppoe-server-1
      duplicate-protection;
      dynamic-profile pppoe-profile;
    }
  }
}

[edit]
user@host# show dynamic-profiles
pppoe-profile {
  interfaces {
    pp0 {
      unit $junos-interface-unit {
        pppoe-options {
          underlying-interface $junos-underlying-interface;
          server;
        }
        family inet {
          unnumbered-address lo0.0;
        }
      }
    }
  }
}

```

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

Verification

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

- [Verifying the Aggregated Ethernet Interface Configuration on page 65](#)
- [Verifying the demux0 Interface Configuration on page 66](#)

Verifying the Aggregated Ethernet Interface Configuration

Purpose Verify that the interface values match your configuration, the link is up, and traffic is flowing.

Action From operational mode, enter the **show interfaces redundancy** command.

```
user@host> show interfaces redundancy
Interface State      Last change Primary      Secondary      Current status
ae0       On primary          ge-5/0/3      ge-5/1/2      both up
```

From operational mode, enter the **show interfaces ae0** command.

```
user@host> show interfaces ae0
Physical interface: ae0, Enabled, Physical link is Up
Interface index: 128, SNMP ifIndex: 606
Link-level type: Ethernet, MTU: 1522, Speed: 1Gbps, BPDU Error: None,
MAC-REWRITE Error: None, Loopback: Disabled, Source filtering: Disabled,
Flow control: Disabled, Minimum links needed: 1, Minimum bandwidth needed: 0
Device flags : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Current address: 00:1f:12:b8:ef:c0, Hardware address: 00:1f:12:b8:ef:c0
Last flapped : 2011-03-11 13:24:18 PST (2d 03:34 ago)
Input rate : 1984 bps (2 pps)
Output rate : 0 bps (0 pps)

Logical interface ae0.32767 (Index 69) (SNMP ifIndex 709)
Flags: SNMP-Traps 0x4004000 VLAN-Tag [ 0x0000.0 ] Encapsulation: ENET2
Statistics Packets pps Bytes bps
Bundle:
  Input : 371259 2 46036116 1984
  Output: 0 0 0 0
Protocol multiservice, MTU: Unlimited
Flags: Is-Primary
```

Meaning The **show interfaces redundancy** output shows the redundant link configuration and that both link interfaces are up. The **show interfaces ae0** output shows that the aggregated Ethernet interface is up and that traffic is being received on the logical interface.

Verifying the demux0 Interface Configuration

Purpose Verify that the VLAN demux interface displays the configured PPPoE family attributes and the member links in the aggregated Ethernet bundle.

Action From operational mode, enter the **show interfaces demux0** command.

```
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-5/0/3
  ge-5/1/2
Input packets : 2
Output packets: 18575
Protocol pppoe
Dynamic Profile: pppoe-profile,
Service Name Table: None,
Max Sessions: 16000, Duplicate Protection: On,
AC Name: pppoe-server-1
```


Alternatively, you can enter **show pppoe underlying-interfaces detail** to display the state and PPPoE family configuration for all configured underlying interfaces. The output also provides information about PPPoE negotiation on a per-VLAN basis.

Meaning The output shows the name of the underlying interface, the member links of the aggregated bundle, and the PPPoE family configuration. The output shows packet counts when traffic is present on the logical interface.

- Related Documentation**
- *Subscriber Interfaces and Demultiplexing Overview*
 - *Static or Dynamic Demux Subscriber Interfaces over Aggregated Ethernet Overview*
 - *Configuring Dynamic Subscriber Interfaces Using VLAN Demux Interfaces in Dynamic Profiles*
 - [Configuring the PPPoE Family for an Underlying Interface on page 47](#)
 - [Configuring a Basic PPPoE Dynamic Profile on page 34](#)

Example: Configuring a Dynamic PPPoE Subscriber Interface on a Dynamic Underlying VLAN Demux Interface over Aggregated Ethernet

This example shows how you can configure dynamic PPPoE subscriber interfaces over aggregated Ethernet bundles to provide subscriber link redundancy.

- [Requirements on page 67](#)
- [Overview on page 67](#)
- [Configuration on page 68](#)
- [Verification on page 73](#)

Requirements

PPPoE over VLAN demux interfaces over aggregated Ethernet requires the following hardware and software:

- MX Series 3D Universal Edge Routers
- MPCs
- Junos OS Release 11.2 or later

No special configuration beyond device initialization is required before you can configure this feature.

Overview

Aggregated Ethernet bundles enable link redundancy between the router and networking devices connected by Ethernet links. This example describes how to configure link redundancy for dynamic PPPoE subscribers over aggregated Ethernet with an intermediate dynamic VLAN demux interface. Sample tasks include configuring a two-member aggregated Ethernet bundle, configuring dynamic profiles that establish the dynamic

VLAN demux interface that underlies the PPPoE subscriber interface, and configuring the dynamic profile that establishes the dynamic PPPoE subscriber interfaces.

In this example, two different dynamic profiles are configured to instantiate either VLAN (**vlan-profile**) or S-VLAN (**svlan-profile**) demux interfaces. These profiles define PPPoE family options and include the dynamic PPPoE profile (**pppoe-profile**) that creates the PPPoE subscriber interface. Junos OS predefined variables are used in each profile to represent the interfaces and VLAN identifiers that are dynamically created. These dynamic profiles include the following predefined variables:

- **\$junos-interface-unit**—Represents the logical unit number of the dynamic VLAN demux interface. This predefined variable is dynamically replaced with the unit number supplied by the router when the subscriber logs in.
- **\$junos-interface-ifd-name**—Represents the underlying logical interface on which the PPPoE subscriber interface is created. This predefined variable is dynamically replaced with the name of the underlying interface supplied by the router when the subscriber logs in.
- **\$junos-vlan-id**—Represents the VLAN identifier. This predefined variable is dynamically replaced with a VLAN ID when the subscriber logs in. The VLAN ID is allocated within the VLAN range specified in the aggregated Ethernet configuration. In the case of the S-VLAN demux, **\$junos-vlan-id** represents the inner VLAN identifier.
- **\$junos-stacked-vlan-id**—Represents the outer VLAN identifier for the stacked VLAN. This predefined variable is dynamically replaced with a VLAN ID when the subscriber logs in. The VLAN ID is allocated within the VLAN range specified in the aggregated Ethernet configuration. This variable is not used for the VLAN demux configuration.

The dynamic PPPoE profile (**pppoe-profile**) creates the PPPoE subscriber interface. It also configures the router to act as a PPPoE server and enables the local address to be derived from the specified address without assigning an explicit IP address to the interface. The **pppoe-profile** dynamic profile is assigned to the dynamic, intermediate VLAN and S-VLAN demux interfaces. This dynamic profile includes the following predefined variables:

- **\$junos-interface-unit**—Represents the logical unit number of the dynamic PPPoE logical interface. This predefined variable is dynamically replaced with the unit number supplied by the router when the subscriber logs in.
- **\$junos-underlying-interface**—Represents the name of the underlying Ethernet interface. This predefined variable is dynamically replaced with the interface name supplied by the router when the subscriber logs in.

This example does not show all possible configuration choices.

Configuration

CLI Quick Configuration

To quickly configure link redundancy for dynamic PPPoE subscribers over a dynamic VLAN demux interface over aggregated Ethernet, copy the following commands, paste them in a text file, remove any line breaks, and then copy and paste the commands into the CLI.

```

[edit]
set chassis aggregated-devices ethernet device-count 1
set interfaces ge-5/0/3 gigether-options 802.3ad ae0
set interfaces ge-5/0/3 gigether-options 802.3ad primary
set interfaces ge-5/1/2 gigether-options 802.3ad ae0
set interfaces ge-5/1/2 gigether-options 802.3ad backup
edit interfaces ae0
set flexible-vlan-tagging
set aggregated-ether-options link-protection
edit auto-configure
set vlan-ranges dynamic-profile vlan-profile accept pppoe
set vlan-ranges dynamic-profile vlan-profile ranges 1-4094
set stacked-vlan-ranges dynamic-profile svlan-profile accept pppoe
set stacked-vlan-ranges dynamic-profile svlan-profile ranges 1-4094,1-4094
top
edit dynamic-profiles pppoe-profile
edit interfaces pp0 unit $junos-interface-unit
set pppoe-options underlying-interface $junos-underlying-interface
set pppoe-options server
set family inet unnumbered-address lo0.0
top
edit dynamic-profiles vlan-profile interfaces demux0
edit unit $junos-interface-unit
set vlan-id $junos-vlan-id
set demux-options underlying-interface $junos-interface-ifd-name
set family pppoe access-concentrator pppoe-server-1
set family pppoe duplicate-protection
set family pppoe dynamic-profile pppoe-profile
top
edit dynamic-profiles svlan-profile interfaces demux0
edit unit $junos-interface-unit
set vlan-tags outer $junos-stacked-vlan-id
set vlan-tags inner $junos-vlan-id
set demux-options underlying-interface $junos-interface-ifd-name
set family pppoe access-concentrator pppoe-server-1
set family pppoe duplicate-protection
set family pppoe dynamic-profile pppoe-profile
top

```

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

To configure link redundancy for dynamic PPPoE subscribers over a dynamic VLAN demux interface over aggregated Ethernet:

1. Define the number of aggregated Ethernet devices on the router.

```

[edit chassis]
user@host# set aggregated-devices ethernet device-count 1

```

2. Configure a two-link aggregated Ethernet logical interface to serve as the underlying interface for the dynamic VLAN demux subscriber interface. In this example, the LAG bundle is configured for one-to-one active/backup link redundancy. To support

link redundancy at the MPC level, the LAG bundle attaches to ports from two different MPCs.

```
[edit interfaces]
user@host# set ge-5/0/3 gigether-options 802.3ad ae0
user@host# set ge-5/0/3 gigether-options 802.3ad primary
user@host# set ge-5/1/2 gigether-options 802.3ad ae0
user@host# set ge-5/1/2 gigether-options 802.3ad backup
```

3. Enable link protection on the aggregated Ethernet logical interface and configure support for single and dual (stacked) VLAN tags.

```
[edit interfaces]
user@host# set ae0 aggregated-ether-options link-protection
user@host# set ae0 flexible-vlan-tagging
```

4. Configure the parameters for automatically configuring VLANs and S-VLANs, including the VLAN ranges and dynamic profiles.

```
[edit interfaces]
user@host# set ae0 auto-configure vlan-ranges dynamic-profile vlan-profile accept
pppoe
user@host# set ae0 auto-configure vlan-ranges dynamic-profile vlan-profile ranges
1-4094
user@host# set ae0 auto-configure stacked-vlan-ranges dynamic-profile
svlan-profile accept pppoe
user@host# set ae0 auto-configure stacked-vlan-ranges dynamic-profile
svlan-profile ranges 1-4094,1-4094
```

5. Configure the dynamic profile that creates the PPPoE subscriber interface.

```
[edit dynamic-profiles pppoe-profile]
user@host# edit interfaces pp0 unit $junos-interface-unit
[edit dynamic-profiles pppoe-profile interfaces pp0 unit "$junos-interface-unit"]
user@host# set pppoe-options underlying-interface $junos-underlying-interface
user@host# set pppoe-options server
user@host# set family inet unnumbered-address lo0.0
```

6. Configure the dynamic profile that creates VLAN demux underlying interfaces, including the PPPoE family attributes.

```
[edit dynamic-profiles vlan-profile]
user@host# edit interfaces demux0 unit $junos-interface-unit
[edit dynamic-profiles vlan-profile interfaces demux0 unit "$junos-interface-unit"]
user@host# set vlan-id $junos-vlan-id
user@host# set demux-options underlying-interface $junos-interface-ifd-name
user@host# set family pppoe access-concentrator pppoe-server-1
user@host# set family pppoe duplicate-protection
user@host# set family pppoe dynamic-profile pppoe-profile
```

7. Configure the dynamic profile that creates S-VLAN demux underlying interfaces, including the PPPoE family attributes.

```
[edit dynamic-profiles svlan-profile]
user@host# edit interfaces demux0 unit $junos-interface-unit
[edit dynamic-profiles svlan-profile interfaces demux0 unit "$junos-interface-unit"]
user@host# set vlan-tags outer $junos-stacked-vlan-id
user@host# set vlan-tags inner $junos-vlan-id
user@host# set demux-options underlying-interface $junos-interface-ifd-name
```

```

user@host# set family pppoe access-concentrator pppoe-server-1
user@host# set family pppoe duplicate-protection
user@host# set family pppoe dynamic-profile pppoe-profile

```

Results From configuration mode, confirm the aggregated device configuration by entering the **show chassis** command. Confirm the interface configuration by entering the **show interfaces** command. Confirm the dynamic profile configuration by entering the **show dynamic-profiles** command. If the output does not display the intended configuration, repeat the configuration instructions in this example to correct it.

```

[edit]
user@host# show chassis
aggregated-devices {
  ethernet {
    device-count 1;
  }
}

[edit]
user@host# show interfaces
ge-5/0/3 {
  gigerther-options {
    802.3ad {
      ae0;
      primary;
    }
  }
}
ge-5/1/2 {
  gigerther-options {
    802.3ad {
      ae0;
      backup;
    }
  }
}
ae0 {
  flexible-vlan-tagging;
  aggregated-ether-options {
    link-protection;
  }
  auto-configure {
    vlan-ranges {
      dynamic-profile {
        vlan-profile {
          accept pppoe;
          vlan-ranges 1-4094;
        }
      }
    }
  }
  stacked-vlan-ranges {
    dynamic-profile {
      svlan-profile {
        accept pppoe;
        vlan-ranges 1-4094,1-4094;
      }
    }
  }
}

```

```
    }
  }
}

[edit]
user@host# show dynamic-profiles
pppoe-profile {
  interfaces {
    pp0 {
      unit $junos-interface-unit {
        pppoe-options {
          underlying-interface $junos-underlying-interface;
          server;
        }
        family inet {
          unnumbered-address lo0.0;
        }
      }
    }
  }
}
vlan-profile {
  interfaces {
    demux0 {
      unit "$junos-interface-unit" {
        vlan-id "$junos-vlan-id";
        demux-options {
          underlying-interface "$junos-interface-ifd-name";
        }
        family pppoe {
          access-concentrator pppoe-server-1;
          duplicate-protection;
          dynamic-profile pppoe-profile;
        }
      }
    }
  }
}
svlan-profile {
  interfaces {
    demux0 {
      unit "$junos-interface-unit" {
        vlan-tags outer "$junos-stacked-vlan-id" inner "$junos-vlan-id";
        demux-options {
          underlying-interface "$junos-interface-ifd-name";
        }
        family pppoe {
          access-concentrator pppoe-server-1;
          duplicate-protection;
          dynamic-profile pppoe-profile;
        }
      }
    }
  }
}
```

```
}

```

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

Verification

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

- [Verifying the Aggregated Ethernet Interface Configuration on page 73](#)

Verifying the Aggregated Ethernet Interface Configuration

Purpose Verify that the interface values match your configuration, the link is up, and traffic is flowing.

Action From operational mode, enter the **show interfaces redundancy** command.

```
user@host> show interfaces redundancy
Interface  State           Last change  Primary    Secondary  Current status
ae0        On primary                ge-5/0/3   ge-5/1/2   both up

```

From operational mode, enter the **show interfaces ae0** command.

```
user@host> show interfaces ae0
Physical interface: ae0, Enabled, Physical link is Up
  Interface index: 128, SNMP ifIndex: 606
  Link-level type: Ethernet, MTU: 1522, Speed: 1Gbps, BPDU Error: None,
  MAC-REWRITE Error: None, Loopback: Disabled, Source filtering: Disabled,
  Flow control: Disabled, Minimum links needed: 1, Minimum bandwidth needed: 0
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Current address: 00:1f:12:b8:ef:c0, Hardware address: 00:1f:12:b8:ef:c0
  Last flapped   : 2011-03-11 13:24:18 PST (2d 03:34 ago)
  Input rate      : 1984 bps (2 pps)
  Output rate     : 0 bps (0 pps)

  Logical interface ae0.32767 (Index 69) (SNMP ifIndex 709)
    Flags: SNMP-Traps 0x4004000 VLAN-Tag [ 0x0000.0 ] Encapsulation: ENET2
    Statistics          Packets      pps      Bytes      bps
    Bundle:
      Input :           371259          2    46036116    1984
      Output:              0          0         0         0
    Protocol multiservice, MTU: Unlimited
    Flags: Is-Primary

```

Meaning The **show interfaces redundancy** output shows the redundant link configuration and that both link interfaces are up. The **show interfaces ae0** output shows that the aggregated Ethernet interface is up and that traffic is being received on the logical interface.

- Related Documentation**
- [Subscriber Interfaces and Demultiplexing Overview](#)
 - [Static or Dynamic Demux Subscriber Interfaces over Aggregated Ethernet Overview](#)
 - [Configuring Dynamic Subscriber Interfaces Using VLAN Demux Interfaces in Dynamic Profiles](#)
 - [Configuring the PPPoE Family for an Underlying Interface on page 47](#)

- [Configuring a Basic PPPoE Dynamic Profile on page 34](#)

CHAPTER 6

Configuration Statements

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- [unit \(Dynamic Profiles Standard Interface\)](#) on page 145
- [unnumbered-address \(Dynamic PPPoE\)](#) on page 147

[\[edit dynamic-profiles\]](#) 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 mcast-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*

[edit protocols pppoe] Hierarchy Level

```
pppoe {
  no-send-pads-error;
  no-send-pads-ac-info;
  pado-advertise;
  service-name-tables table-name {
    service service-name {
      drop;
      delay seconds;
      terminate;
      dynamic-profile profile-name;
      routing-instance routing-instance-name;
      max-sessions number;
      agent-specifier {
        aci circuit-id-string ari remote-id-string {
          drop;
          delay seconds;
          terminate;
          dynamic-profile profile-name;
          routing-instance routing-instance-name;
          static-interface interface-name;
        }
      }
    }
  }
}
traceoptions {
  file <filename> <files number> <match regular-expression > <size maximum-file-size>
    <world-readable | no-world-readable>;
  filter {
    aci regular-expression;
    ari regular-expression;
    service-name regular-expression;
    underlying-interface interface-name;
  }
  flag flag;
  level (all | error | info | notice | verbose | warning);
  no-remote-trace;
}
```

access-concentrator

Syntax	<code>access-concentrator <i>name</i>;</code>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-options],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options]</p>
Release Information	<p>Statement introduced before Junos OS Release 7.4.</p> <p>Support at the [edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options] and [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options] hierarchy levels introduced in Junos OS Release 10.1.</p> <p>Support at the [edit ... family pppoe] hierarchies introduced in Junos OS Release 11.2.</p>
Description	<p>(J Series Services Routers with Point-to-Point Protocol over Ethernet (PPPoE) interfaces)</p> <p>Configure the name of the access concentrator. If you configure a specific access concentrator name on the client and the same access concentrator name server is available, then a PPPoE session is established. If there is a mismatch between the access concentrator names of the client and the server, the PPPoE session gets closed.</p> <p>If you do not configure the access concentrator name, the PPPoE session starts using any available server in the network.</p> <p>(Intelligent Queuing 2 (IQ2) PICs on M120 and M320 routers; MPCs on MX Series routers)</p> <p>Configure an alternative access concentrator name in the AC-NAME tag in a PPPoE control packet for use with a dynamic PPPoE subscriber interface. If you do not configure the access concentrator name, the AC-NAME tag contains the system name.</p>
<div>  <p>NOTE: The [edit ... family pppoe] hierarchies are supported only on MX Series routers with MPCs.</p> </div>	
Options	<i>name</i> —Name of the access concentrator.
Required Privilege	interface—To view this statement in the configuration.
Level	interface-control—To add this statement to the configuration.

- Related Documentation**
- [Identifying the Access Concentrator](#)
 - [Configuring the PPPoE Family for an Underlying Interface on page 47](#)
 - [Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles on page 31](#)
 - [PPPoE Overview](#)

address

Syntax	<code>address (<i>ip-address</i> <i>ipv6-address</i>);</code>
Hierarchy Level	<code>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>],</code> <code>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family <i>family</i>],</code> <code>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i>],</code> <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet],</code> <code>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>]</code>
Release Information	Statement introduced in Junos OS Release 9.2. Support at the <code>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i>]</code> hierarchy level introduced in Junos OS Release 10.1. Support at the <code>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family inet]</code> hierarchy level introduced in Junos OS Release 13.2X50-D10 for EX Series switches.
Description	Configure the interface address.
Options	<i>ip-address</i> —IPv4 address of the interface. <i>ipv6-address</i> —IPv6 address of the interface. When configuring an IPv6 address on a dynamically created interface, use the <i>\$junos-ipv6-address</i> dynamic variable.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring the Protocol Family• Format for Specifying IP Addresses, Network Masks, and Prefixes in Junos OS Configuration Statements• Configuring VLANs for EX Series Switches (CLI Procedure)

chap (Dynamic PPP)

Syntax	<pre>chap { challenge-length minimum <i>minimum-length</i> maximum <i>maximum-length</i>; }</pre>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" ppp-options], [edit dynamic-profiles <i>profile-name</i> interfaces "\$junos-interface-ifd-name" unit "\$junos-interface-unit" ppp-options]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5. Support at the [edit dynamic-profiles <i>profile-name</i> interfaces "\$junos-interface-ifd-name" unit "\$junos-interface-unit" ppp-options] hierarchy level introduced in Junos OS Release 12.2.</p>
Description	<p>Specify CHAP authentication in a PPP dynamic profile.</p> <p>The remaining statement is explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Dynamic Profiles Overview</i> • <i>Configuring Dynamic Authentication for PPP Subscribers</i> • <i>Attaching Dynamic Profiles to Static PPP Subscriber Interfaces</i> • <i>Applying PPP Attributes to L2TP LNS Subscribers Per Inline Service Interface</i>

demux0 (Dynamic Interface)

Syntax demux0 {
 unit *logical-unit-number* {
 demux-options {
 underlying-interface *interface-name*
 }
 family *family* {
 access-concentrator *name*;
 address *address*;
 demux-source {
 source-prefix;
 }
 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;
 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*;
 }
 }

Hierarchy Level [edit [dynamic-profiles](#) *profile-name* [interfaces](#)]

Release Information Statement introduced in Junos OS Release 9.3.

Description Configure the logical demultiplexing (demux) interface in a dynamic profile.

Logical IP demux interfaces do not support IPv4 and IPv6 dual stack.

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 Subscriber Interfaces Using IP Demux Interfaces in Dynamic Profiles](#)
 - [Demultiplexing Interface Overview](#)


direct-connect

Syntax	direct-connect;
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options]</p>
Release Information	Statement introduced in Junos OS 13.3.
Description	Configure the router to ignore any DSL Forum VSAs that it receives in PPPoE control packets when the router is directly connected to CPE devices.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Ignoring DSL Forum VSAs from Directly Connected Devices on page 44 • Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38 • Configuring the PPPoE Family for an Underlying Interface on page 47 • Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7

duplicate-protection (Dynamic PPPoE)

Syntax	duplicate-protection;
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.1.</p> <p>Support for the [edit ... family pppoe] hierarchies introduced in Junos OS Release 11.2.</p>
Description	Prevent 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 media access control (MAC) address is already active on that interface. Duplicate protection is disabled by default. Enabling duplicate protection has no effect on dynamic PPPoE logical interfaces that are already active.
<div style="display: flex; align-items: center;">  <div> <p>NOTE: The [edit ... family pppoe] hierarchies are supported only on MX Series routers with MPCs.</p> </div> </div>	
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38 • Configuring the PPPoE Family for an Underlying Interface on page 47 • Configuring Lockout of PPPoE Subscriber Sessions on page 43 • Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7

dynamic-profile (Dynamic PPPoE)

Syntax	<code>dynamic-profile <i>profile-name</i>;</code>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.1.</p> <p>Support for the [edit ... family pppoe] hierarchies introduced in Junos OS Release 11.2.</p>
Description	<p>Attach a PPPoE dynamic profile to an underlying Ethernet interface. This underlying interface is configured with either the encapsulation ppp-over-ether statement or the family pppoe statement; the two statements are mutually exclusive. When the router creates a dynamic PPPoE logical interface on the underlying interface, it uses the information in the dynamic profile to determine the properties of the dynamic PPPoE logical interface.</p>
<div style="display: flex; align-items: center;">  <div> <p>NOTE: The [edit ... family pppoe] hierarchies are supported only on MX Series routers with MPCs.</p> </div> </div>	
Options	<p><i>profile-name</i>—Name of a previously configured PPPoE dynamic profile, up to 64 characters in length, defined at the [edit dynamic-profiles <i>profile-name</i> interfaces pp0] hierarchy level.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38 • Configuring the PPPoE Family for an Underlying Interface on page 47 • Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7

dynamic-profile (PPPoE Service Name Tables)

Syntax	<code>dynamic-profile <i>profile-name</i>;</code>
Hierarchy Level	<code>[edit protocols pppoe service-name-tables <i>table-name</i> service <i>service-name</i>],</code> <code>[edit protocols pppoe service-name-tables <i>table-name</i> service <i>service-name</i> agent-specifier</code> <code>aci <i>circuit-id-string</i> ari <i>remote-id-string</i>]</code>
Release Information	Statement introduced in Junos OS Release 10.2.
Description	<p>Specify a dynamic profile to instantiate a dynamic PPPoE interface. You can associate a dynamic profile with a named service entry, empty service entry, or any service entry configured in a PPPoE service name table, or with an agent circuit identifier/agent remote identifier (ACI/ARI) pair defined for these services.</p> <p>The dynamic profile associated with a service entry in a PPPoE service name table overrides the dynamic profile associated with the PPPoE underlying interface on which the dynamic PPPoE interface is created.</p> <p>If you include the dynamic-profile statement at the <code>[edit protocols pppoe service-name-tables <i>table-name</i> service <i>service-name</i> agent-specifier aci <i>circuit-id-string</i> ari <i>remote-id-string</i>]</code> hierarchy level, you cannot also include the static-interface statement at this level. The dynamic-profile and static-interface statements are mutually exclusive for ACI/ARI pair configurations.</p>
Options	<i>profile-name</i> —Name of the dynamic profile that the router uses to instantiate a dynamic PPPoE interface.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring PPPoE Service Name Tables• Assigning a Dynamic Profile and Routing Instance to a Service Name or ACI/ARI Pair for Dynamic PPPoE Interface Creation on page 46

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-list name {
        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 {
    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;
      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*
 - *Dynamic Profiles Overview*

encapsulation (Logical Interface)

Syntax	encapsulation (atm-ccc-cell-relay atm-ccc-vc-mux atm-cisco-nlpid atm-mlppp-llc atm-nlpid atm-ppp-llc atm-ppp-vc-mux atm-snap atm-tcc-snap atm-tcc-vc-mux atm-vc-mux ether-over-atm-llc ether-vpls-over-atm-llc ether-vpls-over-fr ether-vpls-over-ppp ethernet ethernet-ccc ethernet-vpls ethernet-vpls-fr frame-relay-ccc frame-relay-ether-type frame-relay-ether-type-tcc frame-relay-ppp frame-relay-tcc gre-fragmentation 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);
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit interfaces rlsq <i>number</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Statement introduced in Junos OS Release 12.1X48 for PTX Series Packet Transport Routers (ethernet , vlan-ccc , and vlan-tcc options only). Statement introduced in Junos OS Release 12.2 for the ACX Series Universal Access Routers. Only the atm-ccc-cell-relay and atm-ccc-vc-mux options are supported on ACX Series routers.
Description	Configure a logical link-layer encapsulation type.
Options	<p>atm-ccc-cell-relay—Use ATM cell-relay encapsulation.</p> <p>atm-ccc-vc-mux—Use ATM virtual circuit (VC) multiplex encapsulation on CCC circuits. When you use this encapsulation type, you can configure the ccc family only.</p> <p>atm-cisco-nlpid—Use Cisco ATM network layer protocol identifier (NLPID) encapsulation. When you use this encapsulation type, you can configure the inet family only.</p> <p>atm-mlppp-llc—For ATM2 IQ interfaces only, use Multilink Point-to-Point (MLPPP) over AAL5 LLC. For this encapsulation type, your router must be equipped with a Link Services or Voice Services PIC. MLPPP over ATM encapsulation is not supported on ATM2 IQ OC48 interfaces.</p> <p>atm-nlpid—Use ATM NLPID encapsulation. When you use this encapsulation type, you can configure the inet family only.</p> <p>atm-ppp-llc—(ATM2 IQ interfaces and MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP only) Use PPP over AAL5 LLC encapsulation.</p> <p>atm-ppp-vc-mux—(ATM2 IQ interfaces and MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP only) Use PPP over ATM AAL5 multiplex encapsulation.</p> <p>atm-snap—(All interfaces including MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP) Use ATM subnetwork attachment point (SNAP) encapsulation.</p> <p>atm-tcc-snap—Use ATM SNAP encapsulation on translational cross-connect (TCC) circuits.</p>

atm-tcc-vc-mux—Use ATM VC multiplex encapsulation on TCC circuits. When you use this encapsulation type, you can configure the **tcc** family only.

atm-vc-mux—(All interfaces including MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP) Use ATM VC multiplex encapsulation. When you use this encapsulation type, you can configure the **inet** family only.

ether-over-atm-llc—(All IP interfaces including MX Series routers with MPC/MIC interfaces using the ATM MIC with SFP) For interfaces that carry IP traffic, use Ethernet over ATM LLC encapsulation. When you use this encapsulation type, you cannot configure multipoint interfaces.

ether-vpls-over-atm-llc—For ATM2 IQ interfaces only, use the Ethernet virtual private LAN service (VPLS) over ATM LLC encapsulation to bridge Ethernet interfaces and ATM interfaces over a VPLS routing instance (as described in RFC 2684, *Multiprotocol Encapsulation over ATM Adaptation Layer 5*). Packets from the ATM interfaces are converted to standard ENET2/802.3 encapsulated Ethernet frames with the frame check sequence (FCS) field removed.

ether-vpls-over-fr—For E1, T1, E3, T3, and SONET interfaces only, use the Ethernet virtual private LAN service (VPLS) over Frame Relay encapsulation to support Bridged Ethernet over Frame Relay encapsulated TDM interfaces for VPLS applications, per RFC 2427, *Multiprotocol Interconnect over Frame Relay*.



NOTE: The SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP, the Channelized SONET/SDH OC3/STM1 (Multi-Rate) MIC with SFP, and the DS3/E3 MIC do not support Ethernet over Frame Relay encapsulation.

ether-vpls-over-ppp—For E1, T1, E3, T3, and SONET interfaces only, use the Ethernet virtual private LAN service (VPLS) over Point-to-Point Protocol (PPP) encapsulation to support Bridged Ethernet over PPP-encapsulated TDM interfaces for VPLS applications.

ethernet—Use Ethernet II encapsulation (as described in RFC 894, *A Standard for the Transmission of IP Datagrams over Ethernet Networks*).

ethernet-ccc—Use Ethernet CCC encapsulation on Ethernet interfaces.

ethernet-vpls—Use Ethernet VPLS encapsulation on Ethernet interfaces that have VPLS enabled and that must accept packets carrying standard Tag Protocol ID (TPID) values.



NOTE: The built-in Gigabit Ethernet PIC on an M7i router does not support extended VLAN VPLS encapsulation.

ethernet-vpls-fr—Use in a VPLS setup when a CE device is connected to a PE device over a time-division multiplexing (TDM) link. This encapsulation type enables the PE device to terminate the outer layer 2 Frame Relay connection, use the 802.1p bits inside the inner Ethernet header to classify the packets, look at the MAC address from the Ethernet header, and use the MAC address to forward the packet into a given VPLS instance.

frame-relay-ccc—Use Frame Relay encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only.

frame-relay-ether-type—Use Frame Relay ether type encapsulation for compatibility with Cisco Frame Relay. The physical interface must be configured with flexible-frame-relay encapsulation.

frame-relay-ether-type-tcc—Use Frame Relay ether type TCC for Cisco-compatible Frame Relay on TCC circuits to connect different media. The physical interface must be configured with flexible-frame-relay encapsulation.

frame-relay-ppp—Use PPP over Frame Relay circuits. When you use this encapsulation type, you can configure the **ppp** family only. J Series routers do not support frame-relay-ppp encapsulation.

frame-relay-tcc—Use Frame Relay encapsulation on TCC circuits for connecting different media. When you use this encapsulation type, you can configure the **tcc** family only.

gre-fragmentation—For adaptive services interfaces only, use GRE fragmentation encapsulation to enable fragmentation of IPv4 packets in GRE tunnels. This encapsulation clears the do not fragment (DF) bit in the packet header. If the packet's size exceeds the tunnel's maximum transmission unit (MTU) value, the packet is fragmented before encapsulation.

multilink-frame-relay-end-to-end—Use MLFR FRF.15 encapsulation. This encapsulation is used only on multilink, link services, and voice services interfaces and their constituent T1 or E1 interfaces, and is supported on LSQ and redundant LSQ interfaces.

multilink-ppp—Use MLPPP encapsulation. This encapsulation is used only on multilink, link services, and voice services interfaces and their constituent T1 or E1 interfaces.

ppp-over-ether—For underlying Ethernet interfaces on J Series routers, use PPP over Ethernet encapsulation. When you use this encapsulation type, you cannot configure the interface address. Instead, configure the interface address on the PPP interface. You also use PPP over Ethernet encapsulation to configure an underlying Ethernet interface for a dynamic PPPoE logical interface on M120 and M320 routers with Intelligent Queuing 2 (IQ2) PICs, and on MX Series routers with MPCs.

ppp-over-ether-over-atm-llc—(J Series routers and MX Series routers with MPCs using the ATM MIC with SFP only) For underlying ATM interfaces, use PPP over Ethernet over ATM LLC encapsulation. When you use this encapsulation type, you cannot configure the interface address. Instead, configure the interface address on the PPP interface.

vlan-bridge—Use Ethernet VLAN bridge encapsulation on Ethernet interfaces that have IEEE 802.1Q tagging, flexible-ethernet-services, and bridging enabled and that must accept packets carrying TPID 0x8100 or a user-defined TPID.

vlan-ccc—Use Ethernet virtual LAN (VLAN) encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only.

vlan-vci-ccc—Use ATM-to-Ethernet interworking encapsulation on CCC circuits. When you use this encapsulation type, you can configure the **ccc** family only.

vlan-tcc—Use Ethernet VLAN encapsulation on TCC circuits. When you use this encapsulation type, you can configure the **tcc** family only.

vlan-vpls—Use Ethernet VLAN encapsulation on VPLS circuits.

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

Related Documentation

- *Configuring Layer 2 Switching Cross-Connects Using CCC*
- *Configuring the Encapsulation for Layer 2 Switching TCCs*
- *Configuring Interface Encapsulation on Logical Interfaces*
- *Configuring MPLS LSP Tunnel Cross-Connects Using CCC*
- *Circuit and Translational Cross-Connects Overview*
- *Identifying the Access Concentrator*
- *Configuring ATM Interface Encapsulation*
- *Configuring VLAN Encapsulation*
- *Configuring Extended VLAN Encapsulation*
- *Configuring ISDN Logical Interface Properties*
- *Configuring ATM-to-Ethernet Interworking*
- *Configuring Interface Encapsulation on PTX Series Packet Transport Routers*
- *Configuring CCC Encapsulation for Layer 2 VPNs*
- *Configuring TCC Encapsulation for Layer 2 VPNs and Layer 2 Circuits*
- *Configuring ATM for Subscriber Access*
- *CoS on ATM IMA Pseudowire Interfaces Overview*
- *Configuring Policing on an ATM IMA Pseudowire*

family

```

Syntax  family family {
        accounting {
            destination-class-usage;
            source-class-usage {
                (input | output | input output);
            }
        }
        access-concentrator name;
        address address {
            ... the address subhierarchy appears after the main [edit interfaces interface-name unit
                logical-unit-number family family-name] hierarchy ...
        }
        bridge-domain-type (bvlan | svlan);
        bundle interface-name;
        core-facing;
        demux-destination {
            destination-prefix;
        }
        demux-source {
            source-prefix;
        }
        direct-connect;
        duplicate-protection;
        dynamic-profile profile-name;
        filter {
            group filter-group-number;
            input filter-name;
            input-list [ filter-names ];
            output filter-name;
            output-list [ filter-names ];
        }
        interface-mode (access | trunk);
        ipsec-sa sa-name;
        isid-list all-service-groups;
        keep-address-and-control;
        mac-validate (loose | strict);
        max-sessions number;
        max-sessions-vsa-ignore;
        mtu bytes;
        multicast-only;
        negotiate-address;
        no-redirects;
        policer {
            arp policer-template-name;
            input policer-template-name;
            output policer-template-name;
        }
        primary;
        protocols [inet iso mpls];
        proxy inet-address address;
        receive-options-packets;
        receive-ttl-exceeded;

```

```

remote (inet-address address | mac-address address);
rpf-check {
    fail-filter filter-name
    mode loose;
}
sampling {
    input;
    output;
}
service {
    input {
        post-service-filter filter-name;
        service-set service-set-name <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>;
(translate-discard-eligible | no-translate-discard-eligible);
(translate-fecn-and-becn | no-translate-fecn-and-becn);
translate-plp-control-word-de;
unnumbered-address interface-name destination address destination-profile profile-name;
vlan-id number;
vlan-id-list [number number-number];
address address {
    arp ip-address (mac | multicast-mac) mac-address <publish>;
    broadcast address;
    destination address;
    destination-profile name;
    eui-64;
    master-only;
    multipoint-destination address dlci dlci-identifier;
    multipoint-destination address {
        epd-threshold cells;
        inverse-arp;
        oam-liveness {
            up-count cells;
            down-count cells;
        }
        oam-period (disable | seconds);
        shaping {
            (cbr rate | rtvbr burst length peak rate sustained rate | vbr burst length peak rate
                sustained rate);
            queue-length number;
        }
        vci vpi-identifier.vci-identifier;
    }
}
preferred;
primary;
vrrp-group group-id {
    (accept-data | no-accept-data);
    advertise-interval seconds;
    authentication-key key;

```



```

authentication-type authentication;
fast-interval milliseconds;
(preempt | no-preempt) {
    hold-time seconds;
}
priority number;
track {
    interface interface-name {
        bandwidth-threshold bits-per-second priority-cost priority;
        priority-cost priority;
    }
    priority-hold-time seconds;
    route prefix routing-instance instance-name priority-cost priority;
}
}
virtual-address [ addresses ];
}
virtual-link-local-address ipv6-address;
}
}

```

Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced before Junos OS Release 7.4. Option max-sessions-vs-a-ignore introduced in Junos OS Release 11.4.
Description	Configure protocol family information for the logical interface.



NOTE: Not all subordinate stanzas are available to every protocol family.

Options *family*—Protocol family:

- **any**—Protocol-independent family used for Layer 2 packet filtering



NOTE: This option is not supported on T4000 Type 5 FPCs.

- **bridge**—(M Series and T Series routers only) Configure only when the physical interface is configured with **ethernet-bridge** type encapsulation or when the logical interface is configured with **vlan-bridge** type encapsulation
- **ethernet-switching**—(M Series and T Series routers only) Configure only when the physical interface is configured with **ethernet-bridge** type encapsulation or when the logical interface is configured with **vlan-bridge** type encapsulation
- **ccc**—Circuit cross-connect protocol suite
- **inet**—Internet Protocol version 4 suite
- **inet6**—Internet Protocol version 6 suite
- **iso**—International Organization for Standardization Open Systems Interconnection (ISO OSI) protocol suite
- **mlfr-end-to-end**—Multilink Frame Relay FRF.15
- **mlfr-uni-nni**—Multilink Frame Relay FRF.16
- **multilink-ppp**—Multilink Point-to-Point Protocol
- **mpls**—Multiprotocol Label Switching (MPLS)
- **pppoe**—Point-to-Point Protocol over Ethernet
- **tcc**—Translational cross-connect protocol suite
- **tnp**—Trivial Network Protocol
- **vpls**—(M Series and T Series routers only) 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

- *Configuring the Protocol Family*
- *Example: Configuring E-LINE and E-LAN Services for a PBB Network on MX Series Routers*
- *Junos OS Services Interfaces Library for Routing Devices*

family (Dynamic Demux Interface)

Syntax `family family {`
 `access-concentrator name;`
 `address address;`
 `demux-source {`
 `source-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>;`
 `}`

Hierarchy Level [edit `dynamic-profiles profile-name interfaces demux0 unit logical-unit-number`]

Release Information Statement introduced in Junos OS Release 9.3.
 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**—Internet Protocol version 4 suite
- **inet6**—Internet Protocol version 6 suite
- **pppoe**—(MX Series routers with MPCs only) Point-to-Point Protocol over Ethernet

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 Subscriber Interfaces Using IP Demux Interfaces in Dynamic Profiles*
 • *Subscriber Interfaces and Demultiplexing Overview*

family (Dynamic PPPoE)

```
Syntax  family family {
        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;
            }
            output filter-name {
                precedence precedence;
            }
        }
    }
```

Hierarchy Level [edit [dynamic-profiles](#) *profile-name* [interfaces](#) pp0 [unit](#) "\$junos-interface-unit"]

Release Information Statement introduced in Junos OS Release 10.1.

Description Configure protocol family information for the logical interface.

Options *family*—Protocol family:

- **inet**—Internet Protocol version 4 suite
- **inet6**—Internet Protocol version 6 suite

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 a Basic PPPoE Dynamic Profile on page 34](#)
- [Configuring a PPPoE Dynamic Profile with Additional Options on page 36](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

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*

filter (Dynamic Firewalls)

Syntax	<pre> filter { adf { counter; input-precedence <i>precedence</i>; not-mandatory; output-precedence <i>precedence</i>; rule <i>rule-value</i>; } input <i>filter-name</i> { <i>precedence</i> <i>precedence</i>; shared-name <i>filter-shared-name</i>; } output <i>filter-name</i> { <i>precedence</i> <i>precedence</i>; shared-name <i>filter-shared-name</i>; } } </pre>
Hierarchy Level	<p>[edit <i>dynamic-profiles</i> <i>profile-name</i> <i>interfaces</i> <i>interface-name</i> <i>unit</i> <i>logical-unit-number</i> <i>family</i> <i>family</i>],</p> <p>[edit <i>dynamic-profiles</i> <i>profile-name</i> <i>interfaces</i> <i>demux0</i> <i>unit</i> <i>logical-unit-number</i> <i>family</i> <i>family</i>],</p> <p>[edit <i>dynamic-profiles</i> <i>profile-name</i> <i>interfaces</i> <i>pp0</i> <i>unit</i> "\$junos-interface-unit" <i>family</i> <i>family</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.2.</p> <p>Support at the [edit <i>dynamic-profiles</i> <i>profile-name</i> <i>interfaces</i> <i>pp0</i> <i>unit</i> "\$junos-interface-unit" <i>family</i> <i>family</i>] hierarchy level introduced in Junos OS Release 10.1.</p> <p><i>shared-name</i> statement added in Junos OS Release 12.2.</p>
Description	<p>Apply a dynamic filter to an interface. You can configure filters for either family inet or family inet6, and the filters can be classic filters, fast update filters, or (for the adf statement) Ascend-Data-Filters. Only the Internet Protocol version 4 (IPv4) protocol family is currently supported for dynamic PPPoE logical interfaces.</p>
Options	<p>input <i>filter-name</i>—Name of one filter to evaluate when packets are received on the interface.</p> <p>output <i>filter-name</i>—Name of one filter to evaluate when packets are transmitted on the interface.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • <i>Firewall Filters Overview</i> • <i>Dynamic Firewall Filters Overview</i> • <i>Classic Filters Overview</i>

- *Basic Classic Filter Syntax*

input (Dynamic Service Sets)

Syntax	<pre>input { service-set service-set-name { service-filter filter-name; } post-service-filter filter-name; }</pre>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> service], [edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> service]
Release Information	Statement introduced in Junos OS Release 9.5. Support at the [edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> service] hierarchy level introduced in Junos OS Release 10.1.
Description	Define the input service sets and filters to be applied to traffic by a dynamic profile. Only the Internet Protocol version 4 (IPv4) protocol family is currently supported for dynamic PPPoE logical interfaces. 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	<ul style="list-style-type: none">• <i>Dynamic Service Sets Overview</i>• <i>Associating Service Sets with Interfaces in a Dynamic Profile</i>

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	<ul style="list-style-type: none">• <i>Physical Interface Configuration Statements Overview</i>• <i>Configuring Aggregated Ethernet Link Protection</i>

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 on page 31](#)
- [Configuring Dynamic VLANs Based on Agent Circuit Identifier Information](#)
- [Subscriber Interface Overview](#)
- [Relationship Between Subscribers and Interfaces in an Access Network](#)
- [Configuring Subscribers over Static Interfaces](#)
- [Demultiplexing Interface Overview](#)

keepalives (Dynamic Profiles)

Syntax	<pre>keepalives { interval <i>seconds</i>; }</pre>
Hierarchy Level	<pre>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit <i>logical-unit-number</i>] [edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit"] [edit dynamic-profiles <i>profile-name</i> interfaces "\$junos-interface-ifd-name" unit "\$junos-interface-unit"]</pre>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Support at the <code>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit"]</code> hierarchy level introduced in Junos OS Release 10.1.</p> <p>Support at the <code>[edit dynamic-profiles <i>profile-name</i> interfaces "\$junos-interface-ifd-name" unit "\$junos-interface-unit"]</code> hierarchy level introduced in Junos OS Release 12.2.</p>
Description	Specify the keepalive interval in a PPP dynamic profile.
Default	Sending of keepalives is enabled by default.
Options	<p>interval <i>seconds</i>—The time in seconds between successive keepalive requests.</p> <p>Range: 1 through 32767 seconds</p> <p>Default: 30 seconds for LNS-based PPP sessions. 10 seconds for all other PPP sessions.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• <i>Dynamic Profiles Overview</i>• <i>Configuring Dynamic Authentication for PPP Subscribers</i>• <i>Applying PPP Attributes to L2TP LNS Subscribers Per Inline Service Interface</i>

max-sessions (Dynamic PPPoE)

Syntax	<code>max-sessions <i>number</i>;</code>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces interface-set <i>interface-set-name</i> pppoe-underlying-options]</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options]</p>
Release Information	<p>Statement introduced in Junos OS Release 10.1.</p> <p>Support for the [edit ... family pppoe] hierarchies introduced in Junos OS Release 11.2.</p> <p>Support at the [edit dynamic-profiles ... interfaces interface-set ... pppoe-underlying-options] hierarchy level introduced in Junos OS Release 12.2.</p>
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.
<div style="display: flex; align-items: center;">  <div> <p>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.</p> </div> </div>	
Options	<p>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.</p> <p>For information about scaling values for PPPoE interfaces, access the <i>Subscriber Management Scaling Values (XLS)</i> spreadsheet from the Downloads box on the <i>Junos OS Subscriber Management</i> pathway page for the current release.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Limiting the Maximum Number of PPPoE Sessions on the Underlying Interface on page 41

- [Defining Agent Circuit Identifier Interface Sets](#)
- [PPPoE Maximum Session Limit Overview on page 10](#)
- [Guidelines for Using PPPoE Maximum Session Limit from RADIUS on page 12](#)
- [Juniper Networks VSAs Supported by the AAA Service Framework](#)
- [Configuring an Interface Set of Subscribers in a Dynamic Profile](#)
- [Subscriber Interfaces and PPPoE Overview on page 3](#)

max-sessions (PPPoE Service Name Tables)

Syntax	max-sessions <i>number</i> ;
Hierarchy Level	[edit protocols pppoe service-name-tables <i>table-name</i> service <i>service-name</i>]
Release Information	Statement introduced in Junos OS Release 10.2.
Description	<p>Configure the maximum number of active PPPoE sessions using either static or dynamic PPPoE interfaces that the router can establish with the specified named service, empty service, or any service entry in a PPPoE service name table. The router maintains a count of active PPPoE sessions for each service entry to determine when the maximum sessions limit has been reached.</p> <p>The router uses the max-sessions value for a PPPoE service name table entry in conjunction with the max-sessions value configured for the PPPoE underlying interface, and with the maximum number of PPPoE sessions supported on your router. If your configuration exceeds any of these maximum session limits, the router is unable to establish the PPPoE session.</p>
Options	<p>number—Maximum number of active PPPoE sessions that the router can establish with the specified PPPoE service name table entry, in the range 1 to the platform-specific maximum PPPoE sessions supported for your router. The default value is equal to the maximum number of PPPoE sessions supported on your routing platform.</p> <p>For information about scaling values for PPPoE interfaces, access the <i>Subscriber Management Scaling Values (XLS)</i> spreadsheet from the Downloads box on the <i>Junos OS Subscriber Management</i> pathway page for the current release.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Limiting the Number of Active PPPoE Sessions Established with a Specified Service Name• Configuring PPPoE Service Name Tables• PPPoE Maximum Session Limit Overview on page 10• Configuring an Interface Set of Subscribers in a Dynamic Profile• Subscriber Interfaces and PPPoE Overview on page 3

max-sessions-vsa-ignore (Static and Dynamic Subscribers)

Syntax	max-sessions-vsa-ignore;
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options]</p>
Release Information	Statement introduced in Junos OS Release 11.4.
Description	<p>Configure the router to ignore (clear) the value returned by RADIUS in the Max-Clients-Per-Interface Juniper Networks vendor-specific attribute (VSA) [26-143], and restore the PPPoE maximum session value on the underlying interface to the value configured in the CLI with the max-sessions statement. The PPPoE maximum session value specifies the maximum number of concurrent static or dynamic PPPoE logical interfaces (sessions) that the router can activate on the PPPoE underlying interface, or the maximum number of active static or dynamic PPPoE sessions that the router can establish with a particular service entry in a PPPoE service name table.</p>
Default	If you do not include the max-sessions-vsa-ignore statement, the maximum session value returned by RADIUS in the Max-Clients-Per-Interface VSA takes precedence over the PPPoE maximum session value configured with the max-sessions statement.
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Limiting the Maximum Number of PPPoE Sessions on the Underlying Interface on page 41 • PPPoE Maximum Session Limit Overview on page 10 • Guidelines for Using PPPoE Maximum Session Limit from RADIUS on page 12 • <i>Juniper Networks VSAs Supported by the AAA Service Framework</i> • <i>Configuring an Interface Set of Subscribers in a Dynamic Profile</i> • Subscriber Interfaces and PPPoE Overview on page 3

no-keepalives (Dynamic Profiles)

Syntax	no-keepalives;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit"]
Release Information	Statement introduced before Junos OS Release 7.4. Support of the [edit dynamic-profiles <i>profile-name</i>] hierarchy level introduced in Junos OS Release 9.5. Support of the [edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit"] hierarchy level introduced in Junos OS Release 10.1.
Description	Disable the sending of keepalives.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Dynamic Profiles Overview</i>• <i>Configuring Dynamic Authentication for PPP Subscribers</i>

output (Dynamic Service Sets)

Syntax	<pre>output { service-set service-set-name { service-filter filter-name; } }</pre>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> service],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> service]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Support of the [edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> service] hierarchy level introduced in Junos OS Release 10.1.</p>
Description	<p>Define the output service sets and filters to be applied to traffic by a dynamic profile. Only the Internet Protocol version 4 (IPv4) protocol family is currently supported for dynamic PPPoE logical interfaces.</p> <p>The remaining statement is explained separately.</p>
Options	<p>service-set-name—Name of the service set.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <i>Dynamic Service Sets Overview</i> <i>Associating Service Sets with Interfaces in a Dynamic Profile</i>

pap (Dynamic PPP)

Syntax	pap;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" ppp-options], [edit dynamic-profiles <i>profile-name</i> interfaces "\$junos-interface-ifd-name" unit "\$junos-interface-unit" ppp-options]
Release Information	Statement introduced in Junos OS Release 9.5. Support at the [edit dynamic-profiles <i>profile-name</i> interfaces "\$junos-interface-ifd-name" unit "\$junos-interface-unit" ppp-options] hierarchy level introduced in Junos OS Release 12.2.
Description	Specify PAP authentication in a PPP dynamic profile.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Dynamic Profiles Overview</i>• <i>Configuring Dynamic Authentication for PPP Subscribers</i>• <i>Attaching Dynamic Profiles to Static PPP Subscriber Interfaces</i>• <i>Applying PPP Attributes to L2TP LNS Subscribers Per Inline Service Interface</i>

post-service-filter (Dynamic Service Sets)

Syntax	<code>post-service-filter <i>filter-name</i>;</code>
Hierarchy Level	[<code>edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> service input</code>], [<code>edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> service input</code>]
Release Information	Statement introduced in Junos OS Release 9.5. Support at the [<code>edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> service input</code>] hierarchy level introduced in Junos OS Release 10.1.
Description	Define the filter to be applied to traffic after service processing. The filter is applied only if a service set is configured and selected. You can configure a postservice filter on the input side of the interface only. Only the Internet Protocol version 4 (IPv4) protocol family is currently supported for dynamic PPPoE logical interfaces.
Options	<i>filter-name</i> —Identifier for the post-service filter.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> <i>Dynamic Service Sets Overview</i> <i>Associating Service Sets with Interfaces in a Dynamic Profile</i>

pp0 (Dynamic PPPoE)

```
Syntax  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;
                    }
                    output filter-name {
                        precedence precedence;
                    }
                }
            }
        }
    }
```

Hierarchy Level [edit [dynamic-profiles profile-name interfaces](#)]

Release Information Statement introduced in Junos OS Release 10.1.

Description Configure the dynamic PPPoE logical interface in a dynamic profile. When the router creates a dynamic PPPoE logical interface on an underlying Ethernet interface configured with PPPoE (**ppp-over-ether**) encapsulation, it uses the information in the dynamic profile to determine the properties of the dynamic PPPoE logical 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	<ul style="list-style-type: none"> • Configuring a Basic PPPoE Dynamic Profile on page 34 • Configuring a PPPoE Dynamic Profile with Additional Options on page 36 • Configuring Dynamic Authentication for PPP Subscribers • For information about creating static PPPoE interfaces, see <i>Configuring PPPoE</i>

ppp-options (Dynamic PPP)

Syntax	<pre>ppp-options { authentication [authentication-protocols]; chap { challenge-length minimum <i>minimum-length</i> maximum <i>maximum-length</i>; } initiate-ncp (ip ipv6 dual-stack-passive) on-demand-ip-address; pap; }</pre>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit"], [edit dynamic-profiles <i>profile-name</i> interfaces "\$junos-interface-ifd-name" unit "\$junos-interface-unit"]
Release Information	Statement introduced in Junos OS Release 9.5. Support at the [edit dynamic-profiles <i>profile-name</i> interfaces "\$junos-interface-ifd-name" unit "\$junos-interface-unit"] hierarchy level introduced in Junos OS Release 12.2.
Description	Configure PPP-specific interface properties in a dynamic profile. 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	<ul style="list-style-type: none"> • <i>Dynamic Profiles Overview</i> • <i>Configuring Dynamic Authentication for PPP Subscribers</i> • <i>Attaching Dynamic Profiles to Static PPP Subscriber Interfaces</i> • <i>Applying PPP Attributes to L2TP LNS Subscribers Per Inline Service Interface</i>

pppoe-options (Dynamic PPPoE)

Syntax	<pre>pppoe-options { underlying-interface <i>interface-name</i>; server; }</pre>
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit"]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	<p>Configure the underlying interface and PPPoE server mode for a dynamic PPPoE logical interface in a dynamic profile.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none">• Configuring a Basic PPPoE Dynamic Profile on page 34• Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles on page 31

pppoe-underlying-options (Static and Dynamic Subscribers)

Syntax	<pre>pppoe-underlying-options { access-concentrator <i>name</i>; dynamic-profile <i>profile-name</i>; direct-connect duplicate-protection; max-sessions <i>number</i>; max-sessions-vsa-ignore; service-name-table <i>table-name</i>; short-cycle-protection <lockout-time-min <i>minimum-seconds</i>> <lockout-time-max <i>maximum-seconds</i>> <filter [<i>aci</i>]>; }</pre>
Hierarchy Level	[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i>], [edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i>]
Release Information	Statement introduced in Junos OS Release 10.0.
Description	<p>Configure PPPoE-specific interface properties for the underlying interface on which the router creates a static or dynamic PPPoE logical interface. The underlying interface must be configured with PPPoE (ppp-over-ether) encapsulation.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> • <i>Configuring PPPoE</i> (for static interfaces) • Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38 • <i>Assigning a Service Name Table to a PPPoE Underlying Interface</i>

precedence

Syntax	<code>precedence <i>precedence</i>;</code>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> filter input <i>filter-name</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> filter output <i>filter-name</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family <i>family</i> filter input <i>filter-name</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family <i>family</i> filter output <i>filter-name</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> filter input <i>filter-name</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> filter output <i>filter-name</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.3.</p> <p>The [edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family inet filter input <i>filter-name</i>] hierarchy level and [edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family inet filter output <i>filter-name</i>] hierarchy level introduced in Junos OS Release 10.1.</p>
Description	Apply a precedence to a dynamic filter. Only the Internet Protocol version 4 (IPv4) protocol family is currently supported for dynamic PPPoE logical interfaces.
Options	<p><i>precedence</i>—Precedence value for the filter. The lower the precedence value, the higher the precedence.</p> <p>Range: 0 through 250</p> <p>Default: 0</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> • Firewall Filters Overview • Dynamic Firewall Filters Overview • Classic Filters Overview • Fast Update Filters Overview • Basic Classic Filter Syntax • Basic Fast Update Filter Syntax

routing-instance (PPPoE Service Name Tables)

Syntax	<code>routing-instance <i>routing-instance-name</i>;</code>
Hierarchy Level	<code>[edit protocols pppoe service-name-tables <i>table-name</i> service <i>service-name</i>],</code> <code>[edit protocols pppoe service-name-tables <i>table-name</i> service <i>service-name</i> agent-specifier</code> <code>aci <i>circuit-id-string</i> ari <i>remote-id-string</i>]</code>
Release Information	Statement introduced in Junos OS Release 10.2.
Description	<p>Use in conjunction with the dynamic-profile statement at the same hierarchy levels to specify the routing instance in which to instantiate a dynamic PPPoE interface. You can associate a routing instance with a named service entry, empty service entry, or any service entry configured in a PPPoE service name table, or with an agent circuit identifier/agent remote identifier (ACI/ARI) pair defined for these services.</p> <p>The routing instance associated with a service entry in a PPPoE service name table overrides the routing instance associated with the PPPoE underlying interface on which the dynamic PPPoE interface is created.</p> <p>If you include the routing-instance statement at the <code>[edit protocols pppoe service-name-tables <i>table-name</i> service <i>service-name</i> agent-specifier aci <i>circuit-id-string</i> ari <i>remote-id-string</i>]</code> hierarchy level, you cannot also include the static-interface statement at this level. The routing-instance and static-interface statements are mutually exclusive for ACI/ARI pair configurations.</p>
Options	<i>routing-instance-name</i> —Name of the routing instance in which the router instantiates the dynamic PPPoE interface.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none"> Configuring PPPoE Service Name Tables Assigning a Dynamic Profile and Routing Instance to a Service Name or ACI/ARI Pair for Dynamic PPPoE Interface Creation on page 46

server (Dynamic PPPoE)

Syntax	server;
Hierarchy Level	[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" ppoe-options]
Release Information	Statement introduced in Junos OS Release 10.1.
Description	In a dynamic profile, configure the router to act as a PPPoE server, also known as a remote access concentrator, when a PPPoE logical interface is dynamically created.
Required Privilege Level	interface—To view this statement in the configuration. interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• Configuring a Basic PPPoE Dynamic Profile on page 34• Subscriber Interfaces and PPPoE Overview on page 3

service (Dynamic Service Sets)

Syntax	<pre> 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; } } } </pre>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i>],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i>]</p>
Release Information	<p>Statement introduced in Junos OS Release 9.5.</p> <p>Support at the [edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i>] hierarchy level introduced in Junos OS Release 10.1.</p>
Description	<p>Define the service sets and filters to be applied to an interface. This statement is not supported for family inet6.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> <i>Dynamic Service Sets Overview</i> <i>Associating Service Sets with Interfaces in a Dynamic Profile</i>

service-filter (Dynamic Service Sets)

Syntax	<code>service-filter <i>filter-name</i>;</code>
Hierarchy Level	<code>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> service input service-set <i>service-set-name</i>],</code> <code>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family <i>family</i> service output service-set <i>service-set-name</i>],</code> <code>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> service input service-set <i>service-set-name</i>],</code> <code>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> service output service-set <i>service-set-name</i>]</code>
Release Information	Statement introduced in Junos OS Release 9.5. Support at the <code>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> service input service-set <i>service-set-name</i>]</code> and <code>[edit dynamic-profiles <i>profile-name</i> interfaces pp0 unit "\$junos-interface-unit" family <i>family</i> service output service-set <i>service-set-name</i>]</code> hierarchy levels introduced in Junos OS Release 10.1.
Description	Define the filter to be applied to traffic before it is accepted for service processing. Configuration of a service filter is optional; if you include the service-set statement without a service-filter definition, the router software assumes that the match condition is true and selects the service set for processing automatically. Only the Internet Protocol version 4 (IPv4) protocol family is currently supported for dynamic PPPoE logical interfaces.
Options	<i>filter-name</i> —Identifies the filter to be applied in service processing.
Required Privilege Level	<code>interface</code> —To view this statement in the configuration. <code>interface-control</code> —To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Dynamic Service Sets Overview</i>• <i>Associating Service Sets with Interfaces in a Dynamic Profile</i>

service-name-tables

Syntax	<pre> service-name-tables <i>table-name</i> { service <i>service-name</i> { drop; delay <i>seconds</i>; terminate; dynamic-profile <i>profile-name</i>; routing-instance <i>routing-instance-name</i>; max-sessions <i>number</i>; agent-specifier { aci <i>circuit-id-string</i> ari <i>remote-id-string</i> { drop; delay <i>seconds</i>; terminate; dynamic-profile <i>profile-name</i>; routing-instance <i>routing-instance-name</i>; static-interface <i>interface-name</i>; } } } } </pre>
Hierarchy Level	[edit protocols pppoe]
Release Information	<p>Statement introduced in Junos OS Release 10.0.</p> <p>dynamic-profile, routing-instance, max-sessions, and static-interface options introduced in Junos OS Release 10.2.</p>
Description	<p>Create and configure a PPPoE service name table. Specify the action taken for each service and remote access concentrator on receipt of a PPPoE Active Discovery Initiation (PADI) packet. You can also specify the dynamic profile and routing instance that the router uses to instantiate a dynamic PPPoE interface, and the maximum number of active PPPoE sessions that the router can establish with the specified service. A maximum of 32 PPPoE service name tables is supported per router.</p>
Options	<p>table-name—Name of the PPPoE service name table, a string of up to 32 alphanumeric characters.</p> <p>The remaining statements are explained separately.</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>
Related Documentation	<ul style="list-style-type: none"> Configuring PPPoE Service Name Tables Creating a Service Name Table

service-set (Dynamic Service Sets)

Syntax	<code>service-set service-set-name { service-filter filter-name; }</code>
Hierarchy Level	<code>[edit dynamic-profiles profile-name interfaces interface-name unit logical-unit-number family family service input]</code> , <code>[edit dynamic-profiles profile-name interfaces interface-name unit logical-unit-number family family service output]</code> , <code>[edit dynamic-profiles profile-name interfaces pp0 unit "\$junos-interface-unit" family family service input]</code> , <code>[edit dynamic-profiles profile-name interfaces pp0 unit "\$junos-interface-unit" family family service output]</code>
Release Information	Statement introduced in Junos OS Release 9.5. Support at the <code>[edit dynamic-profiles profile-name interfaces pp0 unit "\$junos-interface-unit" family family service input]</code> and <code>[edit dynamic-profiles profile-name interfaces pp0 unit "\$junos-interface-unit" family family service output]</code> hierarchy levels introduced in Junos OS Release 10.1.
Description	Define one or more service sets in a dynamic profile. Service sets are applied to an interface. If you define multiple service sets, the router software evaluates the filters in the order in which they appear in the configuration. Only the Internet Protocol version 4 (IPv4) protocol family is currently supported for dynamic PPPoE logical interfaces.
Options	service-set-name —Name of the service set. 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	<ul style="list-style-type: none"><i>Dynamic Service Sets Overview</i><i>Associating Service Sets with Interfaces in a Dynamic Profile</i>

short-cycle-protection (Static and Dynamic Subscribers)

Syntax	<code>short-cycle-protection <lockout-time-min <i>minimum-seconds</i>> <lockout-time-max <i>maximum-seconds</i>> <filter [aci]> ;</code>
Hierarchy Level	<p>[edit dynamic-profiles <i>profile-name</i> interfaces demux0 unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit dynamic-profiles <i>profile-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit interfaces demux0 unit <i>logical-unit-number</i> family pppoe]</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> family pppoe],</p> <p>[edit logical-systems <i>logical-system-name</i> interfaces <i>interface-name</i> unit <i>logical-unit-number</i> pppoe-underlying-options]</p>
Release Information	Statement introduced in Junos OS Release 11.4.
Description	<p>Configure the router to temporarily prevent (lock out) a failed or short-lived (also known as short-cycle) PPPoE subscriber session from reconnecting for a default or configurable period of time. You can optionally override the default lockout time, 1 through 300 seconds (5 minutes), by specifying the minimum lockout time and maximum lockout time as part of the short-cycle-protection statement. You can optionally specify the lockout based on the ACI, which locks out all PPPoE subscriber sessions that come from the same household and share the same ACI string.</p>
Options	<p>filter aci—(Optional) Agent circuit identifier (ACI) lockout for all subscriber sessions.</p> <p>lockout-time-min <i>minimum-seconds</i>—(Optional) Minimum lockout time for failed or short-lived PPPoE subscriber sessions. The <i>minimum-seconds</i> value must be less than or equal to the <i>maximum-seconds</i> value. Setting <i>minimum-seconds</i> and <i>maximum-seconds</i> to the same value causes the lockout time to become fixed at that value.</p> <p>Range: 1 through 86400 (24 hours)</p> <p>Default: 1</p> <p>lockout-time-max <i>maximum-seconds</i>—(Optional) Maximum lockout time for failed or short-lived PPPoE subscriber sessions. The <i>maximum-seconds</i> value must be equal to or greater than the <i>minimum-seconds</i> value. Setting <i>maximum-seconds</i> and <i>minimum-seconds</i> to the same value causes the lockout time to become fixed at that value.</p> <p>Range: 1 through 86400 (24 hours)</p> <p>Default: 300 (5 minutes)</p>
Required Privilege Level	<p>interface—To view this statement in the configuration.</p> <p>interface-control—To add this statement to the configuration.</p>

- Related Documentation**
- [Configuring Lockout of PPPoE Subscriber Sessions on page 43](#)
 - [PPPoE Subscriber Session Lockout Overview on page 13](#)
 - [Understanding the Lockout Period for PPPoE Subscriber Session Lockout on page 18](#)
 - [Configuring Dynamic PPPoE Subscriber Interfaces Using Dynamic Profiles on page 31](#)
 - [Example: Configuring a Static PPPoE Subscriber Interface on a Static Underlying VLAN Demux Interface over Aggregated Ethernet on page 56](#)

underlying-interface (Dynamic PPPoE)

- Syntax** `underlying-interface interface-name;`
- Hierarchy Level** [edit [dynamic-profiles](#) *profile-name* [interfaces](#) [pp0](#) unit “\$junos-interface-unit” [ppoe-options](#)]
- Release Information** Statement introduced in Junos OS Release 10.1.
- Description** In a dynamic profile, configure the underlying interface on which the router creates the dynamic PPPoE logical interface.
- Options** *interface-name*—Variable used to specify the name of the underlying interface on which the PPPoE logical interface is dynamically created. In the **underlying-interface** *interface-name* statement for dynamic PPPoE logical interfaces, you must use the predefined variable `$junos-underlying-interface` in place of *interface-name*. When the router creates the dynamic PPPoE interface, the `$junos-underlying-interface` predefined variable is dynamically replaced with the name of the underlying interface supplied by the network when the subscriber logs in.
- Required Privilege Level** interface—To view this statement in the configuration.
interface-control—To add this statement to the configuration.
- Related Documentation**
- [Configuring a Basic PPPoE Dynamic Profile on page 34](#)
 - [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

unit (Dynamic Demux Interface)

Syntax `unit logical-unit-number {`
 `demux-options {`
 `underlying-interface interface-name`
 `}`
 `family family {`
 `access-concentrator name;`
 `address address;`
 `demux-source {`
 `source-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;`
 `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;`

Hierarchy Level [edit `dynamic-profiles profile-name interfaces demux0`]

Release Information Statement introduced in Junos OS Release 9.3.

Description Configure a dynamic logical interface on the physical device. You must configure a logical interface to be able to use the physical device.

Options *logical-unit-number*—Either the specific unit number of the interface or the unit number variable (`$junos-interface-unit`). The variable is used to specify the unit of the interface when a new demux interface is dynamically created. The static unit number variable is dynamically replaced with the unit number that DHCP supplies when the subscriber logs in.

The remaining statements are explained separately.

Required Privilege	interface—To view this statement in the configuration.
Level	interface-control—To add this statement to the configuration.
Related Documentation	<ul style="list-style-type: none">• <i>Configuring Dynamic Subscriber Interfaces Using IP Demux Interfaces in Dynamic Profiles</i>• <i>Configuring an IP Demultiplexing Interface</i>

unit (Dynamic PPPoE)

```

Syntax  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;
                }
                output filter-name {
                    precedence precedence;
                }
            }
        }
        filter {
            input filter-name;
            output filter-name;
        }
    }

```

Hierarchy Level [edit [dynamic-profiles profile-name interfaces pp0](#)]

Release Information Statement introduced in Junos OS Release 10.1.

Description In a dynamic profile, configure a logical unit number for the dynamic PPPoE logical interface. You must configure a logical interface to be able to use the router.

Options *logical-unit-number*—Variable used to specify the unit number when the PPPoE logical interface is dynamically created. In the **unit** *logical-unit-number* statement for dynamic PPPoE logical interfaces, you must use the predefined variable **\$junos-interface-unit** in place of *logical-unit-number*. The **\$junos-interface-unit** predefined variable is dynamically replaced with the unit number supplied by the router when the subscriber logs in.

The remaining statements are explained separately.

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

Related Documentation

- [Configuring a Basic PPPoE Dynamic Profile on page 34](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

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-vs-a-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](#)
- [Configuring Static Underlying VLAN Interfaces to Use Agent Circuit Identifier Information](#)
- [Agent Circuit Identifier-Based Dynamic VLANs Components Overview](#)

unnumbered-address (Dynamic PPPoE)

Syntax `unnumbered-address interface-name;`

Hierarchy Level [edit [dynamic-profiles profile-name interfaces pp0 unit "\\$junos-interface-unit" family inet](#)]

Release Information Statement introduced in Junos OS Release 10.1.

Description For dynamic PPPoE 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.

Options *interface-name*—Interface from which the local address is derived. The interface name must include a logical unit number and must have a configured address.

The **destination** 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

- [Configuring a Basic PPPoE Dynamic Profile on page 34](#)
- [Dynamic PPPoE Subscriber Interfaces over Static Underlying Interfaces Overview on page 7](#)

PART 3

Administration

- [Monitoring Dynamic PPPoE for Subscriber Access on page 151](#)
- [Monitoring Commands on page 155](#)

CHAPTER 7

Monitoring Dynamic PPPoE for Subscriber Access

- [Clearing Lockout of PPPoE Subscriber Sessions on page 151](#)
- [Verifying and Managing Dynamic PPPoE Configuration on page 152](#)

Clearing Lockout of PPPoE Subscriber Sessions

Purpose	Clear the lockout condition for the PPPoE subscriber session associated with a unique MAC source address.
Action	<ul style="list-style-type: none">• To clear the lockout condition for PPPoE subscriber sessions associated with all MAC source addresses on all underlying interfaces: <pre>user@host> clear pppoe lockout</pre>• To clear the lockout condition for the PPPoE subscriber session associated with the specified MAC source address: <pre>user@host> clear pppoe lockout mac-address <i>mac-address</i></pre>• To clear the lockout condition for all PPPoE subscriber sessions on the specified underlying interface: <pre>user@host> clear pppoe lockout underlying-interfaces <i>underlying-interface-name</i></pre>• To clear the lockout condition for the PPPoE subscriber session associated with the specified MAC source address on the specified underlying interface: <pre>user@host> clear pppoe lockout mac-address <i>mac-address</i> underlying-interfaces <i>underlying-interface-name</i></pre>• To verify that the lockout condition has been cleared: <pre>user@host> show pppoe lockout</pre>
Related Documentation	<ul style="list-style-type: none">• PPPoE Subscriber Session Lockout Overview on page 13• Configuring Lockout of PPPoE Subscriber Sessions on page 43• Verifying and Managing Dynamic PPPoE Configuration on page 152• CLI Explorer

Verifying and Managing Dynamic PPPoE Configuration

Purpose View or clear information about dynamic PPPoE logical interfaces, underlying interfaces for dynamic PPPoE logical interfaces, and PPPoE statistics.

- Action**
- To display information about the properties of all PPPoE underlying interfaces associated with a dynamic PPPoE profile:
`user@host> show pppoe underlying-interfaces`
 - To display information about the PPPoE properties of a specified underlying interface associated with a dynamic PPPoE profile:
`user@host> show pppoe underlying-interfaces interface-name`
 - To display session-specific information about PPPoE interfaces, including whether the interface was dynamically created or statically created:
`user@host> show pppoe interfaces`
 - To display information for a specified PPPoE service name table, including the assigned dynamic profile and routing instance, if configured:
`user@ host> show pppoe service-name-tables table-name`
 - To display information about all active PPPoE sessions on the router:
`user@host > show pppoe sessions`
 - To display information for all active PPPoE sessions established for a specified service name:
`user@host > show pppoe sessions service service-name`
 - To display information for all active PPPoE sessions established for a specified agent circuit identifier (ACI) or agent remote identifier (ARI) string:
`user@host > show pppoe sessions aci "west-ge-2/0/3"`
`user@host > show pppoe sessions ari "sunnyvale"`
 - To display PPPoE control packet statistics for all PPPoE sessions:
`user@host> show pppoe statistics`
 - To display PPPoE control packet statistics for a specified PPPoE underlying interface:
`user@host> show pppoe statistics interface-name`
 - To clear (reset) PPPoE control packet statistics for all PPPoE sessions:
`user@host> clear pppoe statistics`
 - To clear (reset) PPPoE control packet statistics for a specified underlying Ethernet interface:
`user@host> clear pppoe statistics underlying-interface-name`
 - To display summary information about PPPoE subscriber sessions currently undergoing lockout or currently in a lockout grace period on all PPPoE underlying interfaces:
`user@host> show pppoe lockout`

- To display summary information about PPPoE subscriber sessions currently undergoing lockout or currently in a lockout grace period on the specified PPPoE underlying interface:

```
user@host> show pppoe lockout underlying-interface-name
```

Related
Documentation

- [CLI Explorer](#)

CHAPTER 8

Monitoring Commands

- `clear pppoe logout`
- `clear pppoe statistics`
- `show interfaces (10-Gigabit Ethernet)`
- `show interfaces (Gigabit Ethernet)`
- `show pppoe interfaces`
- `show pppoe logout`
- `show pppoe service-name-tables`
- `show pppoe sessions`
- `show pppoe statistics`
- `show pppoe underlying-interfaces`

clear pppoe logout

Syntax	<code>clear pppoe logout</code> <code><mac-address <i>mac-address</i>></code> <code><aci <i>circuit-id</i>></code> <code><underlying-interfaces <i>underlying-interface-name</i>></code>
Release Information	Command introduced in Junos OS Release 11.4.
Description	Clear the logout condition for the PPPoE client associated with the specified MAC source address.
Options	<p>none—Clear the logout condition for the PPPoE clients associated with all MAC source addresses on all PPPoE underlying interfaces.</p> <p>aci—(Optional) Clear the logout condition for the PPPoE client associated with the specified agent circuit identifier (ACI).</p> <p>mac-address <i>mac-address</i>—(Optional) Clear the logout condition for the PPPoE client associated with the specified MAC source address.</p> <p>underlying-interfaces <i>underlying-interface-name</i>—(Optional) Clear the logout condition for all PPPoE clients associated with the specified PPPoE underlying interface.</p>
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• Clearing Lockout of PPPoE Subscriber Sessions on page 151• Configuring Lockout of PPPoE Subscriber Sessions on page 43
List of Sample Output	<p>clear pppoe logout aci (Clear agent circuit identifier (ACI) on All Underlying Interfaces) on page 156</p> <p>clear pppoe logout aci quoted-aci-regexp(Clear agent circuit identifier (ACI) on Specified Underlying Interface) on page 156</p> <p>clear pppoe logout (Clear All MAC Source Addresses on All Underlying Interfaces) on page 157</p> <p>clear pppoe logout mac-address (Clear Specified MAC Source Address) on page 157</p> <p>clear pppoe logout underlying-interfaces (Clear All MAC Source Addresses on Specified Underlying Interface) on page 157</p> <p>clear pppoe logout mac-address underlying-interfaces (Clear Specified MAC Source Address on Specified Underlying Interface) on page 157</p>

Sample Output

[clear pppoe logout aci \(Clear agent circuit identifier \(ACI\) on All Underlying Interfaces\)](#)

```
user@host> clear pppoe logout aci
```

[clear pppoe logout aci quoted-aci-regexp\(Clear agent circuit identifier \(ACI\) on Specified Underlying Interface\)](#)

```
user@host> clear pppoe logout underlying-interfaces demux0.214 aci "Relay-identifier atm
3/0:100\.*"
```

clear pppoe lockdown (Clear All MAC Source Addresses on All Underlying Interfaces)

```
user@host> clear pppoe lockdown
```

clear pppoe lockdown mac-address (Clear Specified MAC Source Address)

```
user@host> clear pppoe lockdown mac-address 00:1d:72:bc:53:30
```

clear pppoe lockdown underlying-interfaces (Clear All MAC Source Addresses on Specified Underlying Interface)

```
user@host> clear pppoe lockdown underlying-interfaces ge-1/0/0.101
```

clear pppoe lockdown mac-address underlying-interfaces (Clear Specified MAC Source Address on Specified Underlying Interface)

```
user@host> clear pppoe lockdown mac-address 00:1d:72:bc:53:30 underlying-interfaces  
ge-1/0/0.101
```

clear pppoe statistics

Syntax	<code>clear pppoe statistics</code> <code><interface <i>interface-name</i>></code> <code><underlying-interface-name></code>
Release Information	Command introduced before Junos OS Release 7.4. <i>underlying-interface-name</i> option introduced in Junos OS Release 9.5.
Description	(J Series routers, M120 routers, M320 routers, and MX Series routers only) Reset PPPoE session statistics information.
Options	none —Reset PPPoE statistics for all interfaces. interface <i>interface-name</i> —(J Series routers) (Optional) Reset PPPoE statistics for the specified interface. <i>underlying-interface-name</i> —(M120 routers, M320 routers, and MX Series routers) (Optional) Reset PPPoE statistics for the specified underlying PPPoE interface.
Required Privilege Level	clear
Related Documentation	<ul style="list-style-type: none">• show pppoe statistics on page 218
List of Sample Output	clear pppoe statistics on page 158 clear pppoe statistics interface (PPPoE Interfaces on J Series Routers) on page 158 clear pppoe statistics (PPPoE Underlying Interfaces on M Series and MX Series Routers) on page 158
Output Fields	When you enter this command, you are provided feedback on the status of your request.

Sample Output

clear pppoe statistics

```
user@host> clear pppoe statistics
```

clear pppoe statistics interface (PPPoE Interfaces on J Series Routers)

```
user@host> clear pppoe statistics interface pp0.1073741827
```

clear pppoe statistics (PPPoE Underlying Interfaces on M Series and MX Series Routers)

```
user@host> clear pppoe statistics ge-4/0/3.2
```

show interfaces (10-Gigabit Ethernet)

Syntax	<pre>show interfaces <i>xe-fpc/pic/port</i> <brief detail extensive terse> <descriptions> <media> <snmp-index <i>snmp-index</i>> <statistics></pre>
Release Information	Command introduced in Junos OS Release 8.0.
Description	(M320, M120, MX Series, and T Series routers and EX Series switches only) Display status information about the specified 10-Gigabit Ethernet interface.
Options	<p><i>xe-fpc/pic/port</i>—Display standard information about the specified 10-Gigabit Ethernet interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
Required Privilege Level	view
List of Sample Output	<p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, IQ2) on page 174</p> <p>show interfaces extensive (10-Gigabit Ethernet, WAN PHY Mode) on page 177</p> <p>show interfaces extensive (10-Gigabit Ethernet, DWDM OTN PIC) on page 179</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode) on page 181</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode, Transmit-Only) on page 181</p> <p>show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode, Receive-Only) on page 182</p>
Output Fields	See Table 5 on page 160 for the output fields for the show interfaces (10-Gigabit Ethernet) command.

Table 5: 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 <i>Common Output Fields Description</i> .	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: <ul style="list-style-type: none"> 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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels

Table 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Link flags	Information about the link. Possible values are described in the “Links Flags” section under <i>Common Output Fields Description</i> .	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.	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 specified
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 specified
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

detail
extensive

Table 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Traffic statistics	<p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> • 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. <p>Gigabit Ethernet and 10-Gigabit Ethernet IQ PICs count the overhead and CRC bytes.</p> <p>For Gigabit Ethernet IQ PICs, the input byte counts vary by interface type. For more information, see Table 5 on page 160.</p>	detail extensive
Input errors	<p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> • 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 the 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 <code>ignore-l3-incompletes</code> 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 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Output errors	<p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> • Carrier transitions—Number of times the interface has gone from down to up. This number does not normally increment quickly, increasing only when the cable is unplugged, the far-end system is powered down and then up, or another problem occurs. If the number of carrier transitions increments quickly (perhaps once every 10 seconds), the cable, the far-end system, or the PIC or PIM is malfunctioning. • Errors—Sum of the outgoing frame aborts and FCS errors. • Drops—Number of packets dropped by the output queue of the I/O Manager ASIC. If the interface is saturated, this number increments once for every packet that is dropped by the ASIC's RED mechanism. • Collisions—Number of Ethernet collisions. The Gigabit Ethernet PIC supports only full-duplex operation, so for Gigabit Ethernet PICs, this number should always remain 0. If it is nonzero, there is a software bug. • Aged packets—Number of packets that remained in shared packet SDRAM so long that the system automatically purged them. The value in this field should never increment. If it does, it is most likely a software bug or possibly malfunctioning hardware. • FIFO errors—Number of FIFO errors in the send direction as reported by the ASIC on the PIC. If this value is ever nonzero, the PIC is probably malfunctioning. • HS link CRC errors—Number of errors on the high-speed links between the ASICs responsible for handling the 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)	<p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> • Queued packets—Number of queued packets. • Transmitted packets—Number of transmitted packets. • Dropped packets—Number of packets dropped by the ASIC's RED mechanism. 	detail extensive
Ingress queues	Total number of ingress queues supported on the specified interface. Displayed on IQ2 interfaces.	extensive
Queue counters (Ingress)	<p>CoS queue number and its associated user-configured forwarding class name. Displayed on IQ2 interfaces.</p> <ul style="list-style-type: none"> • 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

Table 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Active alarms and Active defects	<p>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 routing device configuration, an alarm can ring the red or yellow alarm bell on the routing device, or turn on the red or yellow alarm LED on the craft interface. These fields can contain the value None or Link.</p> <ul style="list-style-type: none"> • 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
OTN alarms	Active OTN alarms identified on the interface.	detail extensive
OTN defects	OTN defects received on the interface.	detail extensive
OTN FEC Mode	<p>The FECmode configured on the interface.</p> <ul style="list-style-type: none"> • efec—Enhanced forward error correction (EFEC) is configured to detect and correct bit errors. • gfec—G.709 Forward error correction (GFEC) mode is configured to detect and correct bit errors. • none—FEC mode is not configured. 	detail extensive
OTN Rate	<p>OTN mode.</p> <ul style="list-style-type: none"> • fixed-stuff-bytes—Fixed stuff bytes 11.0957 Gbps. • no-fixed-stuff-bytes—No fixed stuff bytes 11.0491 Gbps. • pass-through—Enable OTN passthrough mode. • no-pass-through—Do not enable OTN passthrough mode. 	detail extensive
OTN Line Loopback	Status of the line loopback, if configured for the DWDM OTN PIC. Its value can be: enabled or disabled .	detail extensive
OTN FEC statistics	<p>The forward error correction (FEC) counters for the DWDM OTN PIC.</p> <ul style="list-style-type: none"> • 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
OTN FEC alarms	<p>OTN FEC excessive or degraded error alarms triggered on the interface.</p> <ul style="list-style-type: none"> • FEC Degrade—OTU FEC Degrade defect. • FEC Excessive—OTU FEC Excessive Error defect. 	detail extensive
OTN OC	<p>OTN OC defects triggered on the interface.</p> <ul style="list-style-type: none"> • LOS—OC Loss of Signal defect. • LOF—OC Loss of Frame defect. • LOM—OC Loss of Multiframe defect. • Wavelength Lock—OC Wavelength Lock defect. 	detail extensive

Table 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
OTN OTU	OTN OTU defects detected on the interface <ul style="list-style-type: none"> • AIS—OTN AIS alarm. • BDI—OTN OTU BDI alarm. • IAE—OTN OTU IAE alarm. • TTIM—OTN OTU TTIM alarm. • SF—OTN ODU bit error rate fault alarm. • SD—OTN ODU bit error rate defect alarm. • TCA-ES—OTN ODU ES threshold alarm. • TCA-SES—OTN ODU SES threshold alarm. • TCA-UAS—OTN ODU UAS threshold alarm. • TCA-BBE—OTN ODU BBE threshold alarm. • BIP—OTN ODU BIP threshold alarm. • BBE—OTN OTU BBE threshold alarm. • ES—OTN OTU ES threshold alarm. • SES—OTN OTU SES threshold alarm. • UAS—OTN OTU UAS threshold alarm. 	detail extensive
Received DAPI	Destination Access Port Interface (DAPI) from which the packets were received.	detail extensive
Received SAPI	Source Access Port Interface (SAPI) from which the packets were received.	detail extensive
Transmitted DAPI	Destination Access Port Interface (DAPI) to which the packets were transmitted.	detail extensive
Transmitted SAPI	Source Access Port Interface (SAPI) to which the packets were transmitted.	detail extensive
PCS statistics	(10-Gigabit Ethernet interfaces) Displays Physical Coding Sublayer (PCS) fault conditions from the WAN PHY or the LAN PHY device. <ul style="list-style-type: none"> • Bit errors—High bit error rate. Indicates the number of bit errors when the PCS receiver is operating in normal mode. • Errored blocks—Loss of block lock. The number of errored blocks when PCS receiver is operating in normal mode. 	detail extensive

Table 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
MAC statistics	<p>Receive and Transmit statistics reported by the PIC's MAC subsystem, including the following:</p> <ul style="list-style-type: none"> • 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 6 on page 174 • 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—Number of frames that exceed 1518 octets. • Jabber frames—Number of frames that were longer than 1518 octets (excluding framing bits, but including FCS octets), and had either an FCS error or an alignment error. This definition of jabber is different from the definition in IEEE-802.3 section 8.2.1.5 (10BASE5) and section 10.3.1.4 (10BASE2). These documents define jabber as the condition in which any packet exceeds 20 ms. The allowed range to detect jabber is from 20 ms to 150 ms. • Fragment frames—Total number of packets that were less than 64 octets in length (excluding framing bits, but including FCS octets), and had either an FCS error or an alignment error. Fragment frames normally increment because both runts (which are normal occurrences caused by collisions) and noise hits are counted. • VLAN tagged frames—Number of frames that are VLAN tagged. The system uses the TPID of 0x8100 in the frame to determine whether a frame is tagged or not. • Code violations—Number of times an event caused the PHY to indicate "Data reception error" or "invalid data symbol error." 	extensive
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 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Filter statistics	<p>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.</p> <ul style="list-style-type: none"> • 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 routing device from the far-end system, either there is a bad ARP entry on the far-end system, or multicast routing is not on and the far-end system is sending many multicast packets to the local routing device (which the routing device 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	<p>(10-Gigabit Ethernet interfaces, WAN PHY mode) SONET error information:</p> <ul style="list-style-type: none"> • 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. <p>Subfields are:</p> <ul style="list-style-type: none"> • PHY Lock—Phase-locked loop • PHY Light—Loss of optical signal 	extensive

Table 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
WIS section	<p>(10-Gigabit Ethernet interfaces, WAN PHY mode) SONET error information:</p> <ul style="list-style-type: none"> • 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. <p>Subfields are:</p> <ul style="list-style-type: none"> • 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	<p>(10-Gigabit Ethernet interfaces, WAN PHY mode) Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> • 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. State other than OK indicates a problem. <p>Subfields are:</p> <ul style="list-style-type: none"> • 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 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
WIS path	<p>(10-Gigabit Ethernet interfaces, WAN PHY mode) Active alarms and defects, plus counts of specific SONET errors with detailed information.</p> <ul style="list-style-type: none"> • 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. <p>Subfields are:</p> <ul style="list-style-type: none"> • 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 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 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Autonegotiation information	<p>Information about link autonegotiation.</p> <ul style="list-style-type: none"> • Negotiation status: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • Link mode—Depending on the capability of the attached Ethernet device, either Full-duplex or Half-duplex. • Flow control—Types of flow control supported by the remote Ethernet device. For Fast Ethernet interfaces, the type is None. For Gigabit Ethernet interfaces, types are Symmetric (link partner supports PAUSE on receive and transmit), Asymmetric (link partner supports PAUSE on transmit), and Symmetric/Asymmetric (link partner supports both PAUSE on receive and transmit or only PAUSE receive). • 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 link partner: <ul style="list-style-type: none"> • Flow control—Types of flow control supported by the remote Ethernet device. For Gigabit Ethernet interfaces, types are Symmetric (link partner supports PAUSE on receive and transmit), Asymmetric (link partner supports PAUSE on transmit), and Symmetric/Asymmetric (link partner supports both PAUSE on receive and transmit or only PAUSE receive). • 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	<p>(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 routing device at the other end of the fiber. The transmitted path trace value is the message that this routing device transmits.</p>	extensive
Packet Forwarding Engine configuration	<p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> • Destination slot—FPC slot number. 	extensive

Table 5: 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. <ul style="list-style-type: none"> • 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 <i>Common Output Fields Description</i> .	All levels

Table 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
VLAN-Tag	<p>Rewrite profile applied to incoming or outgoing frames on the outer (Out) VLAN tag or for both the outer and inner (In) VLAN tags.</p> <ul style="list-style-type: none"> • 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:	<p>IP demultiplexing (demux) value that appears if this interface is used as the demux underlying interface. The output is one of the following:</p> <ul style="list-style-type: none"> • Source Family Inet • Destination Family Inet 	detail extensive none
Encapsulation	Encapsulation on the logical interface.	All levels
Protocol	Protocol family. Possible values are described in the “Protocol Field” section under <i>Common Output Fields Description</i> .	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
Traffic statistics	<p>Number and rate of bytes and packets received and transmitted on the specified interface set.</p> <ul style="list-style-type: none"> • 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 routing device.	extensive

Table 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
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 <i>Common Output Fields Description</i> .	detail extensive
Donor interface	(Unnumbered Ethernet) Interface from which an unnumbered Ethernet interface borrows an IPv4 address.	detail extensive none
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 parenthesis 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 parenthesis 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 <i>Common Output Fields Description</i> .	detail extensive none
<i>protocol-family</i>	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 address flag (possible values are described in the “Addresses Flags” section under <i>Common Output Fields Description</i> .	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 interlace.	detail extensive none

Table 5: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Generation	Unique number for use by Juniper Networks technical support only.	detail extensive

For Gigabit Ethernet IQ PICs, traffic and MAC statistics output varies. [Table 6 on page 174](#) describes the traffic and MAC statistics for two sample interfaces, each of which is sending traffic in packets of 500 bytes (including 478 bytes for the Layer 3 packet, 18 bytes for the Layer 2 VLAN traffic header, and 4 bytes for cyclic redundancy check [CRC] information). In [Table 6 on page 174](#), the **ge-0/3/0** interface is the inbound physical interface, and the **ge-0/0/0** interface is the outbound physical interface. On both interfaces, traffic is carried on logical unit .50 (VLAN 50).

Table 6: 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	
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 includes 6 bytes for the destination MAC address + 4 bytes for VLAN + 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 extensive (10-Gigabit Ethernet, LAN PHY Mode, IQ2)

```

user@host> show interfaces xe-5/0/0 extensive
Physical interface: xe-5/0/0, Enabled, Physical link is Up
  Interface index: 177, SNMP ifIndex: 99, Generation: 178
  Link-level type: Ethernet, MTU: 1518, LAN-PHY mode, Speed: 10Gbps, Loopback:

```

```

None, Source filtering: Enabled,
Flow control: Enabled
Device flags : Present Running
Interface flags: SNMP-Traps Internal: 0x4000
Link flags : None
CoS queues : 8 supported, 4 maximum usable queues
Schedulers : 1024
Hold-times : Up 0 ms, Down 0 ms
Current address: 00:14:f6:b9:f1:f6, Hardware address: 00:14:f6:b9:f1:f6
Last flapped : Never
Statistics last cleared: Never
Traffic statistics:
Input bytes : 6970332384 0 bps
Output bytes : 0 0 bps
Input packets: 81050506 0 pps
Output packets: 0 0 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 : 6970299398 0 bps
Input packets: 81049992 0 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: 0, 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 81049992 81049992 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
PCS statistics Seconds
Bit errors 0
Errored blocks 0

```

```

MAC statistics:
Total octets          6970332384
Total packets        81050506
Unicast packets      81050000
Broadcast packets    506
Multicast packets    0
CRC/Align errors     0
FIFO errors          0
MAC control frames   0
MAC pause frames     0
Oversized frames     0
Jabber frames        0
Fragment frames      0
VLAN tagged frames   0
Code violations       0

Filter statistics:
Input packet count    81050506
Input packet rejects  506
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

Packet Forwarding Engine configuration:
Destination slot: 5

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 xe-5/0/0.0 (Index 71) (SNMP ifIndex 95) (Generation 195)
Flags: SNMP-Traps 0x4000 VLAN-Tag [ 0x8100.100 ] Encapsulation: ENET2
Egress account overhead: 100
Ingress account overhead: 90

Traffic statistics:
Input bytes : 0
Output bytes : 46
Input packets: 0
Output packets: 1

IPv6 transit statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0

Local statistics:
Input bytes : 0
Output bytes : 46
Input packets: 0
Output packets: 1

Transit statistics:
Input bytes : 0
Output bytes : 0
Input packets: 0
Output packets: 0
Input bytes : 0 bps
Output bytes : 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: 253, Route table: 0
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 192.1.1/24, Local: 192.1.1.1, Broadcast: 192.1.1.255,
Generation: 265
Protocol multiservice, MTU: Unlimited, Generation: 254, Route table: 0
  Flags: None
  Policer: Input: __default_arp_policer__

```

show interfaces extensive (10-Gigabit Ethernet, WAN PHY Mode)

```

user@host> show interfaces xe-1/0/0 extensive
Physical interface: xe-1/0/0, Enabled, Physical link is Up
  Interface index: 141, SNMP ifIndex: 34, Generation: 47
  Link-level type: Ethernet, MTU: 1514, Speed: 10Gbps, Loopback: Disabled
  WAN-PHY mode
  Source filtering: Disabled, Flow control: Enabled
  Device flags   : Present Running
  Interface flags: SNMP-Traps 16384
  Link flags     : None
  CoS queues     : 4 supported
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:05:85:a2:10:9d, Hardware address: 00:05:85:a2:10:9d
  Last flapped   : 2005-07-07 11:22:34 PDT (3d 12:28 ago)
  Statistics last cleared: Never
  Traffic statistics:
    Input bytes :                0                0 bps
    Output bytes :               0                0 bps
    Input packets:              0                0 pps
    Output packets:             0                0 pps
  Input errors:
    Errors: 0, Drops: 0, Framing errors: 0, Runts: 0, Policed discards: 0,
    L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
    HS Link CRC errors: 0, HS Link FIFO overflows: 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
  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 : LOL, LOS, LBL
  Active defects: LOL, LOS, LBL, SEF, AIS-L, AIS-P
  PCS statistics
    Seconds  Count
    Bit errors  0        0
    Errored blocks  0        0
  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          0
  Output packet pad count        0          0
  Output packet error count      0          0
CAM destination filters: 0, CAM source filters: 0
PMA PHY:
  Seconds      Count  State
  PLL lock     0      0 OK
  PHY light    63159  1 Light Missing
WIS section:
  BIP-B1        0      0
  SEF           434430  434438 Defect Active
  LOS           434430  1 Defect Active
  LOF           434430  1 Defect Active
  ES-S          434430
  SES-S         434430
  SEFS-S        434430
WIS line:
  BIP-B2        0      0
  REI-L         0      0
  RDI-L         0      0 OK
  AIS-L         434430  1 Defect Active
  BERR-SF       0      0 OK
  BERR-SD       0      0 OK
  ES-L          434430
  SES-L         434430
  UAS-L         434420
  ES-LFE        0
  SES-LFE       0
  UAS-LFE       0
WIS path:
  BIP-B3        0      0
  REI-P         0      0
  LOP-P         0      0 OK
  AIS-P         434430  1 Defect Active
  RDI-P         0      0 OK
  UNEQ-P        0      0 OK
  PLM-P         0      0 OK
  ES-P          434430
  SES-P         434430
  UAS-P         434420
  ES-PFE        0
  SES-PFE       0
  UAS-PFE       0
Received path trace:
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Transmitted path trace: orissa so-1/0/0
6f 72 69 73 73 61 20 73 6f 2d 31 2f 30 2f 30 00 orissa so-1/0/0.
Packet Forwarding Engine configuration:

```



```

Destination slot: 1
CoS information:
  CoS transmit queue      Bandwidth      Buffer      Priority  Limit
                           %      bps      %      bytes
  0 best-effort           95      950000000  95        0      low      none
  3 network-control       5       50000000  5         0      low      none

```

show interfaces extensive (10-Gigabit Ethernet, DWDM OTN PIC)

```

user@host> show interfaces ge-7/0/0 extensive
Physical interface: ge-7/0/0, Enabled, Physical link is Down
Interface index: 143, SNMP ifIndex: 508, Generation: 208
Link-level type: Ethernet, MTU: 1514, Speed: 10Gbps, BPDU Error: None,
MAC-REWRITE Error: None, Loopback: Disabled, Source filtering: Disabled,
Flow control: Enabled
Device flags   : Present Running Down
Interface flags: Hardware-Down SNMP-Traps Internal: 0x4000
Link flags    : None
Wavelength    : 1550.12 nm, Frequency: 193.40 THz
CoS queues    : 8 supported, 8 maximum usable queues
Hold-times    : Up 0 ms, Down 0 ms
Current address: 00:05:85:70:2b:72, Hardware address: 00:05:85:70:2b:72
Last flapped  : 2011-04-20 15:48:54 PDT (18:39:49 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 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, Policed discards: 0,
L3 incompletes: 0, L2 channel errors: 0, L2 mismatch timeouts: 0,
FIFO errors: 0, Resource errors: 0
Output errors:
Carrier transitions: 2, Errors: 0, Drops: 0, Collisions: 0, Aged packets: 0,
FIFO errors: 0, HS link CRC errors: 0, MTU errors: 0, Resource errors: 0
Egress queues: 8 supported, 4 in use
Queue counters:      Queued packets  Transmitted packets      Dropped packets

  0 best-effort           0              0              0

  1 expedited-fo         0              0              0

  2 assured-forw         0              0              0

  3 network-cont
Queue number:      Mapped forwarding classes
  0                best-effort
  1                expedited-forwarding
  2                assured-forwarding
  3                network-control
Active alarms  : LINK
Active defects : LINK
MAC statistics:
Total octets      Receive      Transmit
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
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
OTN alarms               : None
OTN defects              : None
OTN FEC Mode             : GFEC
OTN Rate                 : Fixed Stuff Bytes 11.0957Gbps
OTN Line Loopback       : Enabled
OTN FEC statistics :
  Corrected Errors          0
  Corrected Error Ratio (   0 sec average) 0e-0
OTN FEC alarms:          Seconds    Count  State
  FEC Degrade             0          0  OK
  FEC Excessive           0          0  OK
OTN OC:                  Seconds    Count  State
  LOS                     2          1  OK
  LOF                     67164      2  Defect Active
  LOM                     67164      71  Defect Active
  Wavelength Lock         0          0  OK
OTN OTU:
  AIS                     0          0  OK
  BDI                     65919      4814  Defect Active
  IAE                     67158      1  Defect Active
  TTIM                    7          1  OK
  SF                      67164      2  Defect Active
  SD                      67164      3  Defect Active
  TCA-ES                  0          0  OK
  TCA-SES                 0          0  OK
  TCA-UAS                 80         40  OK
  TCA-BBE                 0          0  OK
  BIP                     0          0  OK
  BBE                     0          0  OK
  ES                      0          0  OK
  SES                     0          0  OK
  UAS                     587         0  OK
Received DAPI:
00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Received SAPI:

```

```

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Transmitted DAPI:
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Transmitted SAPI:
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
OTN Received Overhead Bytes:
  APS/PCC0: 0x02, APS/PCC1: 0x42, APS/PCC2: 0xa2, APS/PCC3: 0x48
  Payload Type: 0x03
OTN Transmitted Overhead Bytes:
  APS/PCC0: 0x00, APS/PCC1: 0x00, APS/PCC2: 0x00, APS/PCC3: 0x00
  Payload Type: 0x03
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
Packet Forwarding Engine configuration:
  Destination slot: 7
CoS information:
  Direction : Output
  CoS transmit queue      Bandwidth      Buffer Priority
Limit
      0 best-effort        95      9500000000    95      0      low
none
      3 network-control    5       500000000    5       0      low
none
...

```

show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode)

```

user@host> show interfaces xe-7/0/0 extensive
Physical interface: xe-7/0/0, Enabled, Physical link is Up
  Interface index: 173, SNMP ifIndex: 212, Generation: 174
  Link-level type: Ethernet, MTU: 1514, LAN-PHY mode, Speed: 10Gbps,
  Unidirectional: Enabled,
  Loopback: None, Source filtering: Disabled, Flow control: Enabled
  Device flags   : Present Running
...

```

show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode, Transmit-Only)

```

user@host> show interfaces xe-7/0/0-tx extensive
Physical interface: xe-7/0/0-tx, Enabled, Physical link is Up
  Interface index: 176, SNMP ifIndex: 137, Generation: 177
  Link-level type: Ethernet, MTU: 1514, LAN-PHY mode, Speed: 10Gbps,
  Unidirectional: Tx-Only
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : None
  CoS queues     : 8 supported, 8 maximum usable queues
  Hold-times     : Up 0 ms, Down 0 ms
  Current address: 00:05:85:73:e4:83, Hardware address: 00:05:85:73:e4:83
  Last flapped   : 2007-06-01 09:08:19 PDT (3d 02:31 ago)
  Statistics last cleared: Never
Traffic statistics:
  Input bytes   :                0                0 bps

```

```

Output bytes :      322891152287160      9627472888 bps
Input packets:              0              0 pps
Output packets:    328809727380      1225492 pps

...

Filter statistics:
  Output packet count      328810554250
  Output packet pad count      0
  Output packet error count    0
...

Logical interface xe-7/0/0-tx.0 (Index 73) (SNMP ifIndex 138) (Generation 139)

Flags: SNMP-Traps Encapsulation: ENET2
Egress account overhead: 100
Ingress account overhead: 90
Traffic statistics:
  Input bytes :              0
  Output bytes :    322891152287160
  Input packets:              0
  Output packets:    328809727380
IPv6 transit 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 :    322891152287160      9627472888 bps
  Input packets:              0              0 pps
  Output packets:    328809727380      1225492 pps
IPv6 transit statistics:
  Input bytes :              0
  Output bytes :              0
  Input packets:              0
  Output packets:            0
Protocol inet, MTU: 1500, Generation: 147, Route table: 0
  Addresses, Flags: Is-Preferred Is-Primary
    Destination: 10.11.12/24, Local: 10.11.12.13, Broadcast: 10.11.12.255,
  Generation: 141
Protocol multiservice, MTU: Unlimited, Generation: 148, Route table: 0
  Flags: None
  Policer: Input: __default_arp_policer__

```

show interfaces extensive (10-Gigabit Ethernet, LAN PHY Mode, Unidirectional Mode, Receive-Only)

```

user@host> show interfaces xe-7/0/0-rx extensive
Physical interface: xe-7/0/0-rx, Enabled, Physical link is Up
  Interface index: 174, SNMP ifIndex: 118, Generation: 175
  Link-level type: Ethernet, MTU: 1514, LAN-PHY mode, Speed: 10Gbps,
  Unidirectional: Rx-Only
  Device flags   : Present Running
  Interface flags: SNMP-Traps Internal: 0x4000
  Link flags     : None
  CoS queues     : 8 supported, 8 maximum usable queues

```

```

Hold-times      : Up 0 ms, Down 0 ms
Current address: 00:05:85:73:e4:83, Hardware address: 00:05:85:73:e4:83
Last flapped   : 2007-06-01 09:08:22 PDT (3d 02:31 ago)
Statistics last cleared: Never
Traffic statistics:
Input bytes :      322857456303482      9627496104 bps
Output bytes :              0              0 bps
Input packets:      328775413751      1225495 pps
Output packets:              0              0 pps

...

Filter statistics:
Input packet count      328775015056
Input packet rejects    1
Input DA rejects        0

...

Logical interface xe-7/0/0-rx.0 (Index 72) (SNMP ifIndex 120) (Generation 138)

Flags: SNMP-Traps Encapsulation: ENET2
Traffic statistics:
Input bytes :      322857456303482
Output bytes :              0
Input packets:      328775413751
Output packets:              0
IPv6 transit 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 :      322857456303482      9627496104 bps
Output bytes :              0              0 bps
Input packets:      328775413751      1225495 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: 145, Route table: 0
Addresses, Flags: Is-Preferred Is-Primary
Destination: 192.1.1/24, Local: 192.1.1.1, Broadcast: 192.1.1.255,
Generation: 139
Protocol multiservice, MTU: Unlimited, Generation: 146, Route table: 0
Flags: None
Policer: Input: __default_arp_policer__

```

show interfaces (Gigabit Ethernet)

Syntax	<code>show interfaces <i>ge-fpc/pic/port</i></code> <code><brief detail extensive terse></code> <code><descriptions></code> <code><media></code> <code><snmp-index <i>snmp-index</i>></code> <code><statistics></code>
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	<p><i>ge-fpc/pic/port</i>—Display standard information about the specified Gigabit Ethernet interface.</p> <p>brief detail extensive terse—(Optional) Display the specified level of output.</p> <p>descriptions—(Optional) Display interface description strings.</p> <p>media—(Optional) Display media-specific information about network interfaces.</p> <p>snmp-index <i>snmp-index</i>—(Optional) Display information for the specified SNMP index of the interface.</p> <p>statistics—(Optional) Display static interface statistics.</p>
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	<ul style="list-style-type: none">• <i>Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration</i>
List of Sample Output	<p>show interfaces (Gigabit Ethernet) on page 199</p> <p>show interfaces (Gigabit Ethernet on MX Series Routers) on page 199</p> <p>show interfaces extensive (Gigabit Ethernet on MX Series Routers showing interface transmit statistics configuration) on page 200</p> <p>show interfaces brief (Gigabit Ethernet) on page 200</p> <p>show interfaces detail (Gigabit Ethernet) on page 201</p> <p>show interfaces extensive (Gigabit Ethernet IQ2) on page 202</p> <p>show interfaces (Gigabit Ethernet Unnumbered Interface) on page 205</p> <p>show interfaces (ACI Interface Set Configured) on page 205</p>
Output Fields	Table 7 on page 185 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 8 on page 198 .

Table 7: 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 <i>Common Output Fields Description</i> .	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: <ul style="list-style-type: none"> • 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 <i>Common Output Fields Description</i> .	All levels
Interface flags	Information about the interface. Possible values are described in the “Interface Flags” section under <i>Common Output Fields Description</i> .	All levels

Table 7: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Link flags	Information about the link. Possible values are described in the “Links Flags” section under <i>Common Output Fields Description</i> .	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 7: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Traffic statistics	<p>Number and rate of bytes and packets received and transmitted on the physical interface.</p> <ul style="list-style-type: none"> • 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. <p>Gigabit Ethernet and 10-Gigabit Ethernet IQ PICs count the overhead and CRC bytes.</p> <p>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.</p>	detail extensive
Input errors	<p>Input errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> • 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 7: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Output errors	<p>Output errors on the interface. The following paragraphs explain the counters whose meaning might not be obvious:</p> <ul style="list-style-type: none"> • 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. <p>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.</p> <ul style="list-style-type: none"> • 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)	<p>CoS queue number and its associated user-configured forwarding class name.</p> <ul style="list-style-type: none"> • Queued packets—Number of queued packets. • Transmitted packets—Number of transmitted packets. • Dropped packets—Number of packets dropped by the ASIC's RED mechanism. <p>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.</p>	detail extensive
Ingress queues	Total number of ingress queues supported on the specified interface. Displayed on IQ2 interfaces.	extensive

Table 7: 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. <ul style="list-style-type: none"> • 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 . <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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. <ul style="list-style-type: none"> • Bit errors—High bit error rate. Indicates the number of bit errors when the PCS receiver is operating in normal mode. • Errored blocks—Loss of block lock. The number of errored blocks when the PCS receiver is operating in normal mode. 	detail extensive

Table 7: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
MAC statistics	<p>Receive and Transmit statistics reported by the PIC's MAC subsystem, including the following:</p> <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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. <p>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.</p> • 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 7: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Filter statistics	<p>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.</p> <ul style="list-style-type: none"> • 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	<p>(10-Gigabit Ethernet interfaces, WAN PHY mode) SONET error information:</p> <ul style="list-style-type: none"> • 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. <p>Subfields are:</p> <ul style="list-style-type: none"> • PHY Lock—Phase-locked loop • PHY Light—Loss of optical signal 	extensive

Table 7: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
WIS section	<p>(10-Gigabit Ethernet interfaces, WAN PHY mode) SONET error information:</p> <ul style="list-style-type: none"> • 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. <p>Subfields are:</p> <ul style="list-style-type: none"> • 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	<p>(10-Gigabit Ethernet interfaces, WAN PHY mode) Active alarms and defects, plus counts of specific SONET errors with detailed information:</p> <ul style="list-style-type: none"> • 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. <p>Subfields are:</p> <ul style="list-style-type: none"> • 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 7: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
WIS path	<p>(10-Gigabit Ethernet interfaces, WAN PHY mode) Active alarms and defects, plus counts of specific SONET errors with detailed information:</p> <ul style="list-style-type: none"> • 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. <p>Subfields are:</p> <ul style="list-style-type: none"> • 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 7: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
Autonegotiation information	<p>Information about link autonegotiation.</p> <ul style="list-style-type: none"> • Negotiation status: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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	<p>(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.</p>	extensive
Packet Forwarding Engine configuration	<p>Information about the configuration of the Packet Forwarding Engine:</p> <ul style="list-style-type: none"> • Destination slot—FPC slot number. 	extensive

Table 7: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
CoS information	<p>Information about the CoS queue for the physical interface.</p> <ul style="list-style-type: none"> • 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 <i>Common Output Fields Description</i> .	All levels

Table 7: show interfaces Gigabit Ethernet Output Fields (*continued*)

Field Name	Field Description	Level of Output
VLAN-Tag	<p>Rewrite profile applied to incoming or outgoing frames on the outer (Out) VLAN tag or for both the outer and inner (In) VLAN tags.</p> <ul style="list-style-type: none"> • 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	<p>IP demultiplexing (demux) value that appears if this interface is used as the demux underlying interface. The output is one of the following:</p> <ul style="list-style-type: none"> • 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 <i>Common Output Fields Description</i> .	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 7: 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	<p>Number and rate of bytes and packets received and transmitted on the specified interface set.</p> <ul style="list-style-type: none"> • 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	<p>Number and rate of bytes and packets transiting the switch.</p> <p>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.</p>	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 <i>Common Output Fields Description</i> .	detail extensive
Donor interface	(Unnumbered Ethernet) Interface from which an unnumbered Ethernet interface borrows an IPv4 address.	detail extensive none

Table 7: 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 <i>Common Output Fields Description</i> .	detail extensive none
<i>protocol-family</i>	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 <i>Common Output Fields Description</i> .	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 8: 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	<p>Traffic statistics:</p> <p>Input bytes: 496 bytes per packet, representing the Layer 2 packet</p> <p>MAC statistics:</p> <p>Received octets: 500 bytes per packet, representing the Layer 2 packet + 4 bytes</p>	The additional 4 bytes are for the CRC.
Inbound logical interface	show interfaces ge-0/3/0.50 extensive	<p>Traffic statistics:</p> <p>Input bytes: 478 bytes per packet, representing the Layer 3 packet</p>	

Table 8: 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      500000000   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      500000000   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 7 on page 185](#).

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 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	<p>none—Display interface information for all PPPoE interfaces.</p> <p>brief detail—(Optional) Display the specified level of output.</p> <p>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.</p> <p>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.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration
List of Sample Output	show pppoe interfaces on page 209 show pppoe interfaces (Status for the Specified Interface) on page 209 show pppoe interfaces brief on page 210 show pppoe interfaces detail on page 210 show pppoe interfaces extensive (J Series Services Routers only) on page 210 show pppoe interfaces (PPPoE Subscriber Interface with ACI Interface Set) on page 210
Output Fields	Table 9 on page 207 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 9: 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 9: 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 <i>hh:mm:ss</i> .	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 9: show pppoe interfaces Output Fields (*continued*)

Field Name	Field Description	Level of Output
Packet Type	<p>Number of packets sent and received during the PPPoE session, categorized by packet type and packet errors:</p> <ul style="list-style-type: none"> • 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	<p>(J Series Services Routers only) Information about timeouts that occurred during the PPPoE session:</p> <ul style="list-style-type: none"> • 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 interface	State	Session ID	Remote 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 lockout

Syntax	show pppoe lockout <underlying-interface-name>
Release Information	Command introduced in Junos OS Release 11.4.
Description	Display summary information about PPPoE clients currently undergoing lockout or currently in a lockout grace period on all PPPoE underlying logical interfaces or on a specified PPPoE underlying logical interface.
Options	<p>none—Display information about the lockout condition and the lockout grace period for PPPoE clients on all PPPoE underlying logical interfaces.</p> <p>underlying-interface-name—(Optional) Name of the PPPoE underlying logical interface.</p>
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Verifying and Managing Dynamic PPPoE Configuration on page 152 • Configuring Lockout of PPPoE Subscriber Sessions on page 43
List of Sample Output	show pppoe lockout underlying-interface-name on page 212
Output Fields	Table 10 on page 211 lists the output fields for the show pppoe lockout command. Output fields are listed in the approximate order in which they appear.

Table 10: show pppoe lockout Output Fields

Field Name	Field Description
<i>underlying-Interface-name</i>	Name of the PPPoE underlying logical interface.
Index	Index number of the logical interface, which reflects its initialization sequence.
Short-cycle Protection level	State of PPPoE short cycle protection: On 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.
Lockout Time (seconds)	<p>Displays the PPPoE lockout time range, the number of PPPoE clients in lockout condition, and the number of PPPoE clients in a lockout grace period:</p> <ul style="list-style-type: none"> • 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 <i>lockout grace period</i> occurs when the time between lockout events is greater than either 15 minutes or the maximum lockout time.

Table 10: show pppoe lockout Output Fields (*continued*)

Field Name	Field Description
Client Address	MAC source address of the PPPoE client.
Current	Current lockout time, in seconds; displays 0 (zero) if the PPPoE client is not undergoing lockout.
Elapsed	Time elapsed into the lockout period, in seconds; displays 0 (zero) if the PPPoE client is not undergoing lockout
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.

Sample Output

show pppoe lockout underlying-interface-name

```

user@host> show pppoe lockout xe-1/0/0.0
xe-1/0/0.0 Index 10305
  Lockout Time (seconds): Min: 1, Max: 300
    Total clients in lockout: 2
    Total clients in lockout grace period: 1

Client Address           Current  Elapsed  Next
02:01:00:00:00:05        16       10       32
04:01:00:00:00:ab       256      168      300
0b:cd:ef:00:00:23         0         0         8

```

show pppoe service-name-tables

Syntax	show pppoe service-name-tables <table-name>
Release Information	Command introduced in Junos OS Release 10.0.
Description	(M120 routers, M320 routers, and MX Series routers only) Display configuration information about PPPoE service name tables.
Options	none —Display the names of configured PPPoE service name tables. table-name —(Optional) Name of a configured PPPoE service name table.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> • Verifying a PPPoE Configuration • Verifying and Managing Dynamic PPPoE Configuration on page 152
List of Sample Output	show pppoe service-name-tables on page 214 show pppoe service-name-tables (For the Specified Table Name) on page 214
Output Fields	Table 11 on page 213 lists the output fields for the show pppoe service-name-tables command. Output fields are listed in the approximate order in which they appear.

Table 11: show pppoe service-name-tables Output Fields

Field Name	Field Description	Level of Output
Service Name Table	Name of the PPPoE service name table.	none
Service Name	Name of a configured service in the PPPoE service name table: <ul style="list-style-type: none"> • <empty>—Service of zero length that represents an unspecified service • <any>—Default service for non-empty service entries that do not match the configured empty or named service entries • service-name—Named service entry 	none
Action	Action taken when the PPPoE underlying interface receives a PPPoE Active Discovery Initiation (PADI) packet with the specified named service, empty service, any service, or ACI/ARI pair: <ul style="list-style-type: none"> • Delay seconds—Number of seconds that the interface delays before responding with a PPPoE Active Discovery Offer (PADO) packet • Drop—Interface drops (ignores) the packet. • Terminate—Interface responds immediately with a PADO packet 	none
Dynamic Profile	Name of the dynamic profile with which the router creates a dynamic PPPoE subscriber interface. A dynamic profile can be assigned to a named service, empty service, any service, or ACI/ARI pair.	none

Table 11: show pppoe service-name-tables Output Fields (*continued*)

Field Name	Field Description	Level of Output
Routing Instance	Name of the routing instance in which to instantiate the dynamic PPPoE subscriber interface. A routing instance can be assigned to a named service, empty service, any service, or ACI/ARI pair.	none
Max Sessions	Maximum number of active PPPoE sessions that the router can establish with the specified named service, empty service, or any service.	none
Active Sessions	Current count of active PPPoE sessions created using the specified named service, empty service, or any service. The Active Sessions value cannot exceed the Max Sessions value.	none
ACI	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. An ACI can be configured as part of an ACI/ARI pair for a named service, empty service, or any service.	none
ARI	Agent remote identifier (ARI) 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. An ARI can be configured as part of an ACI/ARI pair for a named service, empty service, or any service.	none
Static Interface	Name of the static PPPoE interface reserved for exclusive use by the PPPoE client with matching ACI/ARI information. A static interface can be configured only for an ACI/ARI pair.	none

Sample Output

show pppoe service-name-tables

```

user@host> show pppoe service-name-tables
Service Name Table: test1
Service Name Table: test2
Service Name Table: test3

```

show pppoe service-name-tables (For the Specified Table Name)

```

user@host> show pppoe service-name-tables Table1
Service Name Table: Table1
  Service Name: <empty>
    Action: Terminate
    Dynamic Profile: BasicPppoeProfile
    Max Sessions: 100
    Active Sessions: 3
  Service Name: <any>
    Action: Drop
    ACI: velorum-ge-2/0/3
    ARI: westford
      Action: Terminate
      Static Interface: pp0.100
    ACI: volantis-ge-5/0/5
    ARI: sunnyvale

```

```
      Action: Terminate
      Static Interface: pp0.101
Service Name: Wholesale
      Action: Terminate
      Dynamic Profile: WholesalePppoeProfile
      Routing Instance: WholesaleRI
      Max Sessions: 16000
      Active Sessions: 4
```

show pppoe sessions

Syntax	<pre>show pppoe sessions <aci circuit-id-string> <ari remote-id-string> <service service-name></pre>	
Release Information	Command introduced in Junos OS Release 10.2.	
Description	(M120 routers, M320 routers, and MX Series routers only) Display information about all active PPPoE sessions on the router, or about the active PPPoE sessions established for a specified service name, agent circuit identifier (ACI), or agent remote identifier (ARI).	
Options	<p>none—Display information for all active PPPoE sessions on the router.</p> <p>aci circuit-id-string—(Optional) Display information only for active PPPoE sessions established with the specified agent circuit identifier. The agent circuit identifier corresponds to the DSLAM interface that initiated the service request.</p> <p>ari remote-id-string—(Optional) Display information only for active PPPoE sessions established with the specified agent remote identifier. The agent remote identifier corresponds to the subscriber associated with the DSLAM interface that initiated the service request.</p> <p>service service-name—(Optional) Display information only for active PPPoE sessions established with the specified service, where <i>service-name</i> can be empty, any, or a named service.</p>	
Required Privilege Level	view	
Related Documentation	<ul style="list-style-type: none"> • Verifying a PPPoE Configuration • Verifying and Managing Dynamic PPPoE Configuration on page 152 	
List of Sample Output	show pppoe sessions (For All Active Sessions) on page 217 show pppoe sessions (For All Active Sessions Matching the Agent Circuit Identifier) on page 217	
Output Fields	Table 12 on page 216 lists the output fields for the show pppoe sessions command. Output fields are listed in the approximate order in which they appear.	

Table 12: show pppoe sessions Output Fields

Field Name	Field Description	Level of Output
Interface	Name of the statically-created or dynamically-created PPPoE interface for the active PPPoE session.	none
Underlying interface	Interface on which PPPoE is running.	none

Table 12: show pppoe sessions Output Fields (*continued*)

Field Name	Field Description	Level of Output
State	State of the PPPoE session; displays Session Up for active PPPoE sessions.	none
Session ID	PPPoE session identifier.	none
Remote MAC	MAC address of the remote side of the connection, either the access concentrator or the PPPoE client.	none

Sample Output

show pppoe sessions (For All Active Sessions)

```

user@host> show pppoe sessions
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 sessions (For All Active Sessions Matching the Agent Circuit Identifier)

```

user@host> show pppoe sessions aci "velorum-ge-2/0/3"
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

```

show pppoe statistics

Syntax	<code>show pppoe statistics</code> <code><logical-interface-name></code>
Release Information	Command introduced before Junos OS Release 7.4. <i>logical-interface-name</i> option introduced in Junos OS Release 10.1.
Description	(J Series Services Routers, M120 routers, M320 routers, and MX Series routers only) Display statistics information about PPPoE interfaces.
Options	none —Display PPPoE statistics for all interfaces. <i>logical-interface-name</i> —(Optional) Name of a PPPoE underlying logical interface. Supported for M120 routers, M320 routers, and MX Series routers only.
Required Privilege Level	view
Related Documentation	<ul style="list-style-type: none"> <code>show ppp address-pool</code> show pppoe underlying-interfaces on page 220
List of Sample Output	show pppoe statistics on page 219 show pppoe statistics (For the Specified Underlying Interface Only) on page 219
Output Fields	Table 13 on page 218 lists the output fields for the show pppoe statistics command. Output fields are listed in the approximate order in which they appear.

Table 13: show pppoe statistics Output Fields

Field Name	Field Description
Active PPPoE sessions	<p>Total number of active PPPoE sessions and the number of packets sent and received during the PPPoE session, categorized by packet type and packet errors:</p> <ul style="list-style-type: none"> 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.

Table 13: show pppoe statistics Output Fields (*continued*)

Field Name	Field Description
Timeouts	<p>Information about timeouts that occurred during the PPPoE session (not displayed for M120, M320, and MX Series routers):</p> <ul style="list-style-type: none"> • PADI—No PADR packet has been received within the timeout period. (This value is always zero and is not supported.) • PADO—No PPPoE Active Discovery Offer packet has been received within the timeout period. • PADR—No PADS packet has been received within the timeout period.

Sample Output

show pppoe statistics

```

user@host> show pppoe statistics
Active PPPoE sessions: 1
  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
  Timeouts
  PADI            0
  PADO            0
  PADR            0

```

show pppoe statistics (For the Specified Underlying Interface Only)

```

user@host> show pppoe statistics ge-4/0/3.2
Active PPPoE sessions: 4
  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

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	<ul style="list-style-type: none"> • Verifying and Managing Dynamic PPPoE Configuration on page 152 • Configuring an Underlying Interface for Dynamic PPPoE Subscriber Interfaces on page 38 • Configuring the PPPoE Family for an Underlying Interface on page 47 • Verifying and Managing Agent Circuit Identifier-Based Dynamic VLAN Configuration
List of Sample Output	show pppoe underlying-interfaces brief on page 223 show pppoe underlying-interfaces detail on page 223 show pppoe underlying-interfaces extensive on page 223 show pppoe underlying-interfaces extensive (PPPoE client in lockout condition) on page 224 show pppoe underlying-interfaces lockout on page 224 show pppoe underlying-interfaces detail (Autosensing Configured for ACI-based Dynamic VLANs) on page 225
Output Fields	Table 14 on page 220 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: <ul style="list-style-type: none"> • 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): <ul style="list-style-type: none"> • 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 <i>lockout grace period</i> 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,
```


PART 4

Troubleshooting

- [Acquiring Troubleshooting Information on page 229](#)

CHAPTER 9

Acquiring Troubleshooting Information

- [Collecting Subscriber Access Logs Before Contacting Juniper Technical Support on page 229](#)

Collecting Subscriber Access Logs Before Contacting Juniper Technical Support

Problem 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 235](#)

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