

## Chapter 7

# Configuring Point-to-Point Protocol over Ethernet

This chapter describes how to configure the Point-to-Point Protocol (PPP) over Ethernet interfaces on E-series routers.

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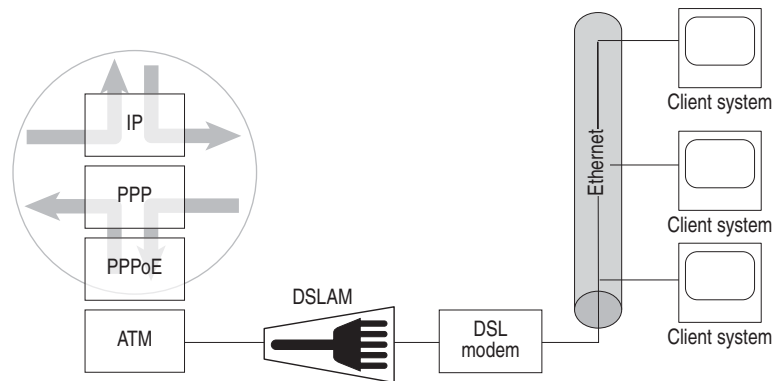
## Overview

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E-series routers use PPP over Ethernet (PPPoE) to enable multiple hosts to open PPP sessions to the router using one or more bridging modems. When service providers want to maintain the session abstraction associated with PPP, PPPoE is used with Broadband Remote Access Server (B-RAS) technologies that provide a bridged Ethernet topology. PPPoE can be configured over ATM or on Ethernet modules with or without VLANs.

Figure 11 shows how PPPoE allows the router to handle multiple PPP sessions originating on an Ethernet module to be multiplexed over one PVC on an ATM interface. PPP, as described in *Chapter 4, Configuring Point-to-Point Protocol*, runs above the PPPoE layer.

**Figure 11: PPPoE over ATM**



The router handles the server part of PPPoE session management and never initiates a setup of a PPPoE session. The router only responds to session requests that are sent to it by the remote PPP client. After the sessions are set up, the router demultiplexes the sessions based on session identifiers assigned to a specific connection.

## PPPoE Stages

PPPoE has two distinct stages: Discovery and Session.

### Discovery

PPPoE includes a Discovery protocol that allows each PPP session to learn the Ethernet address of the remote peer, as well as establish a unique session identifier. When a host wants to initiate a PPPoE session, it must first perform Discovery to identify the Ethernet MAC address of the peer and establish a PPPoE session ID.

Although PPP defines a peer-to-peer relationship, Discovery is inherently a client-server relationship. In the Discovery process, a host acting as a client discovers a remote access concentrator (AC), which acts as the server.

Based on the network topology, there may be more than one remote AC with whom the host can communicate. The Discovery stage allows the host to discover all remote ACs and then select the one to which it wants to connect.

In summary, the Discovery stage consists of the following four steps:

1. The host (PPPoE client) broadcasts a PPPoE Active Discovery Initiation (PADI) packet to all remote ACs in the network.
2. One or more remote ACs respond to the PADI packet by sending a PPPoE Active Discovery Offer (PADO) packet, indicating that they can serve the client request. The PADO packet includes the name of the AC from which it was sent.

3. The host sends a unicast PPPoE Active Discovery Request (PADR) packet to the AC to which it wants to connect.
4. The selected AC sends a PPPoE Active Discovery Session (PADS) packet to confirm the session.

### Session

When Discovery is successfully completed, both the host and the selected remote AC have the information they need to build their point-to-point connection over Ethernet.

The only parameter that you can configure is the number of PPPoE sessions.




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**NOTE:** The router supports dynamic PPPoE interfaces. Also, profiles support PPPoE interfaces. See *Chapter 12, Configuring Dynamic Interfaces* and *Chapter 13, Configuring Dynamic Interfaces Using Bulk Configuration*, for more information.

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## PPPoE Service Name Tables

PPPoE clients use service name tags, as defined in RFC 2516, to request that an AC support certain services. The client includes a specific service name tag in the PADI packet that it broadcasts to remote ACs, or it can include an empty service name tag of zero length to indicate that any service is acceptable.

On receipt of a PADI packet that it can serve, the AC responds with a PADO packet. The PADO packet contains a service name tag that is identical to the one in the PADI, as well as one or more additional service name tags indicating other services that the AC offers.

### Features

PPPoE service name tables enable an AC, such as an E-series router, to support multiple service name tags in addition to the empty service name tag. You can configure up to 16 different PPPoE service name tables per E-series router to:

- Define the set of specific service name tags that the router advertises in the PADO packets sent to PPPoE clients.
- Control whether the router responds to (terminate) or ignores (drop) PADI requests containing an empty service name tag.

## Table Structure

Each entry, or row, in a PPPoE service name table consists of the following components:

- **Service name tag**—Service name tags specify the client services that an AC supports. Every PPPoE service name table includes one empty service name tag, which is a tag of zero length used to represent any service. In addition, you can configure up to 16 specific service name tags per table to specify custom values such as an ISP name or class of service.
- **Action**—Each service name tag has an associated action: terminate (the default action) or drop. For the empty service name tag, you can specify that the router ignore (drop), rather than respond to (terminate), all PADI requests containing the empty service name tag. By contrast, when you configure a specific (custom) service name tag, you cannot specify the action; the default action, terminate, is always used.

For example, Table 14 shows a PPPoE service name table containing four entries: an empty service name tag (“ ”) associated with the drop action, and three specific service name tags. Note that the only action currently supported for a specific service name tag is terminate.

**Table 14: Sample PPPoE Service Name Table**

Service-Name	Action
“myISPService”	Terminate
“myQOSClass1”	Terminate
“myQOSClass2”	Terminate
“ ”	Drop

## Enabling the Table for Use

After you create a PPPoE service name table and populate it with entries, you must enable it for use with a static or dynamic PPPoE interface. To enable a PPPoE service name table for use with a static interface, you assign the table to the PPPoE major interface. To enable a PPPoE service name table for use with a dynamic interface, you add the table to a profile that is dynamically assigned to a PPPoE interface column. For details about configuring and using PPPoE service name tables, see *Configuring PPPoE Service Name Tables* on page 260.

### **Using the PPPoE Remote Circuit ID to Identify Subscribers**

You can enable the router to capture and format a vendor-specific tag containing a PPPoE remote circuit ID transmitted from a digital subscriber line access multiplexer (DSLAM) device. The router can then send this value to a Remote Authentication Dial-In User Service (RADIUS) server or to a Layer 2 Tunneling Protocol (L2TP) network server (LNS) to uniquely identify subscriber locations.

This feature is supported on all modules on which you can configure PPPoE interfaces. The feature is particularly useful in Ethernet-based Broadband Remote Access Server (B-RAS) configurations as a means of uniquely identifying subscribers connected to the router on a single Ethernet link.

For detailed configuration instructions, see *Configuring PPPoE Remote Circuit ID Capture* on page 268.

### **Application**

When a connection between an E-series router and a DSLAM is on an ATM interface, subscribers are typically assigned an ATM PVC to communicate with the router. Each ATM PVC is created on a different ATM 1483 subinterface. When a RADIUS server in this configuration sends messages to the router containing the NAS-Port-Id [87] RADIUS attribute, each ATM 1483 subinterface produces a unique NAS-Port-Id that can differentiate subscribers on the ATM link.

By contrast, when the connection between the router and the DSLAM is on an Ethernet interface that does not use either virtual LANs (VLANs) or stacked VLANs (S-VLANs), the NAS-Port-Id value is the same for all subscribers on the Ethernet link. Enabling the router to capture the remote circuit ID sent from the DSLAM and use it as a RADIUS or L2TP attribute facilitates the process of identifying individual subscribers on an Ethernet link.

### **PPPoE Remote Circuit ID Capture**

When you enable capture of the PPPoE remote circuit ID by issuing the **pppoe remote-circuit-id** command, the E-series router captures the remote circuit ID value if it is sent from the DSLAM. The PPPoE intermediate agent on the DSLAM appends a vendor-specific tag containing the remote circuit ID to the existing PPPoE PADI or PADR packet and sends this packet to the E-series router. The PPPoE remote circuit ID value can be a maximum of 64 characters. The router stores this value on the line module on which the PPPoE interface is configured.

## PPPoE Remote Circuit ID Format

By default, the router formats the captured PPPoE remote circuit ID to include only the agent-circuit-id suboption (suboption 1) of the PPPoE intermediate agent tags sent from the DSLAM. To configure a nondefault format for the captured PPPoE remote circuit ID, you can use one of the **radius remote-circuit-id-format** commands listed in Table 15.

**Table 15: Configuring Nondefault Formats for the PPPoE Remote Circuit ID**

To Configure This Nondefault Format	Use This Command
Include only the agent-remote-id suboption (suboption 2) of the tags supplied by the PPPoE intermediate agent	host1(config)# <b>radius remote-circuit-id-format agent-remote-id</b>
Include both the agent-circuit-id suboption (suboption 1) and the agent-remote-id suboption (suboption 2) of the tags supplied by the PPPoE intermediate agent	host1(config)# <b>radius remote-circuit-id-format agent-circuit-id agent-remote-id</b>
Include the NAS-Identifier [32] RADIUS attribute with either or both of the agent-circuit-id and agent-remote-id suboptions of the tags supplied by the PPPoE intermediate agent	host1(config)# <b>radius remote-circuit-id-format nas-identifier agent-circuit-id</b> or host1(config)# <b>radius remote-circuit-id-format nas-identifier agent-remote-id</b> or host1(config)# <b>radius remote-circuit-id-format nas-identifier agent-circuit-id agent-remote-id</b>
Append the agent-circuit-id suboption to an interface specifier that is consistent with the recommended format in the DSL Forum Technical Report (TR)-101—Migration to Ethernet-Based DSL Aggregation (April 2006).  For details about how the router implements this format, see <i>Format for dsl-forum-1</i> Keyword on page 242.	host1(config)# <b>radius remote-circuit-id-format dsl-forum-1</b>

For more information about configuring the format of the PPPoE remote circuit ID value, see **radius remote-circuit-id-format** on page 272.

## Remote Circuit ID Delimiter

If the format of the PPPoE remote circuit ID consists of two or more components, the router uses a # character by default to delimit the components. Optionally, you can use the **radius remote-circuit-id-delimiter** command to configure a nondefault delimiter character (for example, ! or %) to separate multiple components in the PPPoE remote circuit ID value. For information about how to use this command, see **radius remote-circuit-id-delimiter** on page 272.

## Format for dsl-forum-1 Keyword

When you specify the **radius remote-circuit-id-format** command with the **dsl-forum-1** keyword, the router appends the agent-circuit-id suboption value to an interface specifier that is consistent with the recommended format in the DSL Forum Technical Report (TR)-101—Migration to Ethernet-Based DSL Aggregation (April 2006).

The format of the PPPoE remote circuit ID when you use the **dsl-forum-1** keyword is as follows:

*dslForum1InterfaceSpecifier#agent-circuit-id*

where:

- *dslForum1InterfaceSpecifier* is the interface specifier in **dsl-forum-1** format
- **#** is the default delimiter character
- *agent-circuit-id* is the agent-circuit-id suboption (suboption 1) of the PPPoE intermediate agent tags sent from the DSLAM

If the DSLAM transmits empty data for *agent-circuit-id*, the router appends the value 0/0/0/0/0/0 to *dslForum1InterfaceSpecifier*.

To obtain the value for *dslForum1InterfaceSpecifier*, the router translates an internally generated interface specifier into the format for the **dsl-forum-1** keyword, using the following conventions:

- The **dsl-forum-1** format for ATM interfaces is *atm slot/adapter/port:vpi.vci*
- The **dsl-forum-1** format for Ethernet interfaces is *eth slot/adapter/port:svlanId.vlanId*
- For the E120 router or the E320 router, the router uses the actual *adapter* value (0 or 1) in the **dsl-forum-1** format. For ERX-14xx models, ERX-7xx models, and the ERX-310 router, which do not support an *adapter* value, the router sets the *adapter* value to 0 (zero).
- For Ethernet interfaces that use VLANs but do not use S-VLANs, the router sets the *svlanId* value to 4096 and uses the actual *vlanId* value in the **dsl-forum-1** format.
- For Ethernet interfaces that use neither S-VLANs nor VLANs, the router sets both the *svlanId* value and the *vlanId* value to 4096 in the **dsl-forum-1** format.
- The router ignores subinterface values for ATM and Ethernet interfaces in the translated **dsl-forum-1** format.



**NOTE:** The format of the interface specifier that the router generates internally is different from the interface specifier format that you use to configure interfaces on the router. For information about the interface types and specifiers to use when configuring interfaces on E-series routers, see *Interface Types and Specifiers* in *JUNOS Command Reference Guide, About This Guide*.

**Format Examples for dsl-forum-1 Keyword**

Table 16 provides several examples of how the router uses the conventions described in *Format for dsl-forum-1 Keyword* on page 242 to translate internally generated interface specifiers into the format of the *dslForum1InterfaceSpecifier* value. The examples in the table use adapter 1 for interfaces on an E120 router or E320 router, and adapter 0 (no adapter value) for interfaces on ERX-14xx models, ERX-7xx models, and the ERX-310 router.

**Table 16: Interface Specifier Format Examples for dsl-forum-1 Keyword**

Interface Example	Internal Router Format	How Router Translates	Format of <i>dslForum1InterfaceSpecifier</i>
ATM 1483 subinterface on slot 2, port 0, subinterface 1 with VPI 100 and VCI 101	atm 2/0.1:100.101	<ul style="list-style-type: none"> <li>■ Sets <i>adapter</i> to 0</li> <li>■ Ignores subinterface 1</li> <li>■ Uses other values as supplied</li> </ul>	atm 2/0/0:100.101
ATM 1483 subinterface on slot 3, adapter 1, port 7, subinterface 6 with VPI 200 and VCI 201	atm 3/1/7.6:200.201	<ul style="list-style-type: none"> <li>■ Ignores subinterface 6</li> <li>■ Uses other values as supplied</li> </ul>	atm 3/1/7:200.201
Gigabit Ethernet interface on slot 2, port 0 with no VLAN or S-VLAN subinterfaces	gigabitEthernet 2/0	<ul style="list-style-type: none"> <li>■ Sets <i>adapter</i> to 0</li> <li>■ Sets both <i>svlanId</i> and <i>vlanId</i> to 4096</li> <li>■ Uses other values as supplied</li> </ul>	eth 2/0/0:4096.4096
Gigabit Ethernet interface on slot 4, adapter 1, port 1 with no VLAN or S-VLAN subinterfaces	gigabitEthernet 4/1/1	<ul style="list-style-type: none"> <li>■ Sets both <i>svlanId</i> and <i>vlanId</i> to 4096</li> <li>■ Uses other values as supplied</li> </ul>	eth 4/1/1:4096.4096
Gigabit Ethernet interface on slot 2, port 0, subinterface 1 with VLAN ID 5	gigabitEthernet 2/0.1:5	<ul style="list-style-type: none"> <li>■ Sets <i>adapter</i> to 0</li> <li>■ Ignores subinterface 1</li> <li>■ Sets <i>svlanId</i> to 4096</li> <li>■ Uses other values as supplied</li> </ul>	eth 2/0/0:4096.5
Gigabit Ethernet interface on slot 4, adapter 1, port 1, subinterface 3 with VLAN ID 10	gigabitEthernet 4/1/1.3:10	<ul style="list-style-type: none"> <li>■ Ignores subinterface 3</li> <li>■ Sets <i>svlanId</i> to 4096</li> <li>■ Uses other values as supplied</li> </ul>	eth 4/1/1:4096.10
Gigabit Ethernet interface on slot 2, port 0, subinterface 1 with S-VLAN ID 5 and VLAN ID 6	gigabitEthernet 2/0.1:5-6	<ul style="list-style-type: none"> <li>■ Sets <i>adapter</i> to 0</li> <li>■ Ignores subinterface 1</li> <li>■ Replaces - (hyphen) between <i>svlanId</i> and <i>vlanId</i> with . (period)</li> <li>■ Uses other values as supplied</li> </ul>	eth 2/0/0:5.6
Gigabit Ethernet interface on slot 4, adapter 1, port 1, subinterface 3 with S-VLAN ID 10 and VLAN ID 20	gigabitEthernet 4/1/1.3:10-20	<ul style="list-style-type: none"> <li>■ Ignores subinterface 3</li> <li>■ Replaces - (hyphen) between <i>svlanId</i> and <i>vlanId</i> with . (period)</li> <li>■ Uses other values as supplied</li> </ul>	eth 4/1/1:10.20



### Use by RADIUS or L2TP

Enabling the router to capture and format the PPPoE remote circuit ID sent from the DSLAM has no effect by itself. To use the PPPoE remote circuit ID value, you must send it to a RADIUS server, to an L2TP network server (LNS), or to both by doing one or more of the following:

- Issue the **radius override calling-station-id remote-circuit-id** command to substitute the remote circuit ID value for the standard Calling-Station-Id [31] RADIUS attribute.
- Issue the **radius override nas-port-id remote-circuit-id** command to substitute the remote circuit ID value for the standard NAS-Port-Id [87] RADIUS attribute.
- Issue the **aaa tunnel calling-number-format** command to generate L2TP Calling Number attribute value pair (AVP) 22 in a descriptive format that includes either or both of the agent-circuit-id (suboption 1) and agent-remote-id (suboption 2) suboptions of the PPPoE intermediate agent tags.

For more information about configuring RADIUS and L2TP on E-series routers, see the *JUNOS Broadband Access Configuration Guide*.

### System Event Log

You can use the `radiusSendAttributes` system event log category to troubleshoot applications that use PPPoE remote circuit ID capture. The `radiusSendAttributes` event category logs RADIUS attributes added to outbound RADIUS requests.

You can also use the **log severity debug pppoeControlPacket** command to configure a packet trace log for a PPPoE interface that includes the PPPoE remote circuit ID value captured on that interface. For information about how to use the **log severity debug pppoeControlPacket** command, see *Troubleshooting on page 287*.

For information about how to log system events, see *JUNOS System Event Logging Reference Guide, Chapter 1, System Logging Overview*.

## PPPoE MTU Configuration

To avoid fragmentation and reassembly, Ethernet access networks require larger MTU sizes for PPP traffic. With JUNOS PPPoE MTU, you can control the deployment of larger packet sizes. You can configure PPPoE MTU directly on the PPPoE interface or use a dynamic configuration profile. When you use the PPPoE MTU tag, each PPPoE subinterface can have a unique MTU value. Operational MTU is the lesser of the PPPoE MTU or the lower layer MTU minus the PPPoE overhead.

You can use the **pppoe mtu** command to set the MTU using a combination of lower layer restrictions and controls:

- Greater MTU than the current maximum permitted by RFC 2516, with the default equal to the current maximum setting (1494 octets)
- Optional setting for absolute maximum PPPoE MTU
- Optional use of a larger lower layer MTU

- Optional use of the PPPoE-Max-Mtu tag transmitted from the client

## Platform Considerations

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You can configure PPPoE interfaces on the following E-series routers:

- E120 router
- E320 router
- ERX-1440 router
- ERX-1410 router
- ERX-710 router
- ERX-705 router
- ERX-310 router

## Module Requirements

For information about the modules that support PPPoE interfaces on ERX-14xx models, ERX-7xx models, and the ERX-310 router:

- See *ERX Module Guide, Table 1, Module Combinations* for detailed module specifications.
- See *ERX Module Guide, Appendix A, Module Protocol Support* for information about the modules that support PPPoE.

For information about the modules that support PPPoE interfaces on the E120 router and the E320 router:

- See *E120 and E320 Module Guide, Table 1, Modules and IOAs* for detailed module specifications.
- See *E120 and E320 Module Guide, Appendix A, IOA Protocol Support* for information about the modules that support PPPoE.

## Interface Specifiers

The configuration task examples in this chapter use the *slot/port[.subinterface]* format to specify the physical interface on which you want to configure PPPoE. However, the interface specifier format that you use depends on the router that you are using.

For ERX-7xx models, ERX-14xx models, and ERX-310 routers, use the *slot/port[.subinterface]* format. For example, the following command specifies ATM 1483 subinterface 10 on slot 0, port 1 of an ERX-7xx model, ERX-14xx model, or ERX-310 router.

```
host1(config)#interface atm 0/1.10
```

For E120 and E320 routers, use the *slot/adapter/port[.subinterface]* format, which includes an identifier for the bay in which the I/O adapter (IOA) resides. In the software, adapter 0 identifies the right IOA bay (E120 router) and the upper IOA bay (E320 router); adapter 1 identifies the left IOA bay (E120 router) and the lower IOA bay (E320 router). For example, the following command specifies ATM 1483 subinterface 20 on slot 5, adapter 0, port 0 of an E320 router.

```
host1(config)#interface atm 5/0/0.20
```

For more information about supported interface types and specifiers on E-series routers, see *Interface Types and Specifiers* in *JUNOS Command Reference Guide, About This Guide*.

## References

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For more information about PPPoE, consult the following resources:

- DSL Forum Technical Report (TR)-101—Migration to Ethernet-Based DSL Aggregation (April 2006)
- Extensions to a Method for Transmitting PPP over Ethernet (PPPoE)—draft-carrel-info-pppoe-ext-00.txt (November 2000 expiration)
- IEEE 802.1q (Virtual LANs)
- RFC 2516—Method for Transmitting PPP over Ethernet (PPPoE) (February 1998)



**NOTE:** IETF drafts are valid for only 6 months from the date of issuance. They must be considered as works in progress. Please refer to the IETF Web site at <http://www.ietf.org> for the latest drafts.

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## Before You Configure PPPoE

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Before you attempt to configure a PPPoE interface, configure the physical interface over which PPPoE traffic will flow. The procedures described in this chapter assume that a physical interface has been configured.

## Configuring PPPoE over ATM

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This section provides an example of a common PPPoE over ATM configuration.

See the following resources for additional information:

- *Chapter 1, Configuring ATM*—Provides detailed information about ATM technology and line interface module capabilities.
- *Chapter 9, Configuring Bridged Ethernet*—Provides configuration information about Bridged Ethernet, which allows multiple upper-layer interface types (IP and PPPoE) to be simultaneously multiplexed over the same interface.

- *Chapter 12, Configuring Dynamic Interfaces*—Provides detailed information about configuring ATM to support dynamic interfaces.
- *JUNOS Physical Layer Configuration Guide, Chapter 5, Configuring Ethernet Interfaces*

To configure PPPoE over ATM:

1. Configure a physical interface.

```
host1(config)#interface atm 0/1
```

2. Configure the ATM 1483 subinterface.

```
host1(config-if)#interface atm 0/1.20
```

3. Configure a PVC by specifying the *vcd* (virtual circuit descriptor), the *vpi* (virtual path identifier), the *vci* (virtual channel identifier), and the encapsulation type.

```
host1(config-if)#atm pvc 10 22 100 aal5snap
```

4. Select PPPoE as the encapsulation method.

```
host1(config-subif)#encapsulation pppoe
```

5. Configure a maximum number of PPPoE sessions on the interface.

```
host1(config-if)#pppoe sessions 128
```

6. Create a PPPoE subinterface.

```
host1(config-subif)#interface atm 0/1.20.1
```

7. Select PPP as the encapsulation method.

```
host1(config-subif)#encapsulation ppp
```

8. (Optional) Configure maximum transfer unit (MTU) parameters.

```
host1(config-if)#pppoe mtu 1380
```

9. (Optional) Configure an access concentrator (AC) name on the PPPoE interface.

```
host1(config-subif)#pppoe acname CYM9876
```

10. (Optional) Set up the router to prevent a client from establishing more than one session using the same MAC address.

```
host1(config-subif)#pppoe duplicate-protection
```

11. Assign an IP address and subnet mask to the PVC.

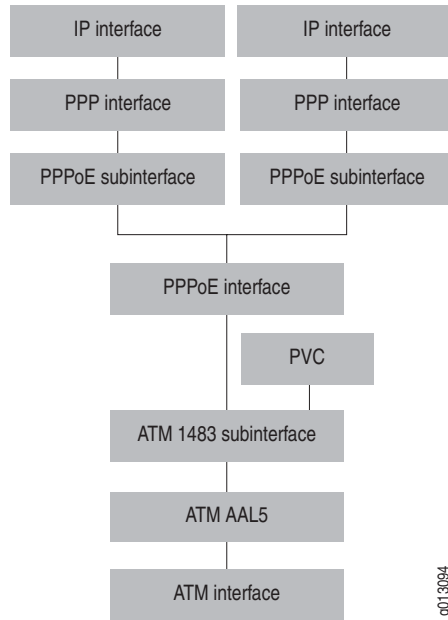
```
host1(config-subif)#ip address 192.32.10.20 255.255.255.0
```

12. (Optional) Configure additional PPPoE subinterfaces by completing Steps 6 through 11 using unique numbering.

```
host1(config-subif)#interface atm 0/1.20.2
```

Figure 12 illustrates the interface stack for this configuration.

**Figure 12: Example of PPPoE over ATM Stacking**



g013094

**atm pvc**

- Use to configure a PVC on an ATM interface.
- The following parameters are mandatory:
  - *vcd*—Virtual circuit descriptor, which identifies a virtual circuit in the range 1–2147483647. The *vcd* is a unique number that you assign, which identifies a virtual circuit. The *vcd value* has no relationship to the *vpi* and *vci* values and has meaning only to the E-series router.
  - *vpi*—Virtual path identifier of the PVC. The VPI is an 8-bit field in the ATM cell header. The VPI value is unique on a single link, not throughout the ATM network, because it has meaning only to the E-series router. The VPI value must match the value on the switch. The parameters *vpi* and *vci* cannot be both set to 0; if one is 0, the other cannot be 0.
  - *vci*—Virtual channel identifier. The VCI is a 16-bit field in the ATM cell header. The VCI value is unique on a single link, not throughout the ATM network, because it has meaning only to the E-series router. The parameters *vpi* and *vci* cannot be both set to 0; if one is 0, the other cannot be 0.
  - encapsulation type:
    - **aal5snap**—Specifies a logical link control (LLC) encapsulated circuit. An LLC/Subnetwork Access Protocol (LLC/SNAP) header precedes the protocol datagram.
    - **aal5mux ip**—Specifies a multiplexed circuit used for IP only.
    - **aal5autoconfig**—Enables the autodetection of a 1483 encapsulation (LLC/SNAP or VC multiplexed).
- Example  

```
host1(config-if)#atm pvc 10 100 22 aal5autoconfig
```
- Use the **no** version to remove the specified PVC.

**encapsulation ppp**

- Use to specify PPP as the encapsulation method for the interface.
- Example  

```
host1(config-subif)#encapsulation ppp
```
- Use the **no** version to disable PPP on an interface.

**encapsulation pppoe**

- Use to specify PPPoE as the encapsulation method for the interface.
- Example  

```
host1(config-subif)#encapsulation pppoe
```
- Use the **no** version to disable PPPoE on an interface.

**interface atm**

- Use to configure an ATM interface.
- To specify an ATM interface for ERX-7xx models, ERX-14xx models, and ERX-310 routers, use the *slot/port.[subinterface]* format.
  - *slot*—Number of the chassis slot
  - *port*—Port number on the I/O module
  - *subinterface*—Number of the subinterface in the range 1–2147483647
- To specify an ATM interface for E120 and E320 routers, use the *slot/adapter/port[.subinterface]* format.
  - *slot*—Number of the chassis slot
  - *adapter*—Identifier for the IOA within the E320 chassis, either 0 or 1, where:
    - 0 indicates that the IOA is installed in the right IOA bay (E120 router) or the upper IOA bay (E320 router).
    - 1 indicates that the IOA is installed in the left IOA bay (E120 router) or the lower IOA bay (E320 router).
  - *port*—Port number on the IOA
  - *subinterface*—Number of the subinterface in the range 1–2147483647
- For more information, see *Creating a Basic Configuration* in *Chapter 1, Configuring ATM*.
- Examples
 

```
host1(config)#interface atm 0/1.19
host1(config)#interface atm 0/0/1.19
```
- Use the **no** version to remove the interface or subinterface.

**ip address**

- Use to assign an IP address and subnet mask to a subinterface.
- Example
 

```
host1(config-if)#ip address 192.1.1.1 255.255.255.0
```
- Use the **no** version to remove an IP address or disable IP processing.

**pppoe acName**

- Use to configure an access concentrator (AC) name on the PPPoE interface. When the AC (the server) receives a PPPoE Active Discovery Initiation (PADI) packet that it can serve, it replies by sending a PPPoE Active Discovery Offer (PADO) packet. The PADO packet contains the AC name configured using this command.
- If the AC name is not configured, the router name is used.
- The AC name can be a maximum of 64 characters.

- Example  
host1(config-subif)#**pppoe acName CYM9876**
- Use the **no** version to remove the AC name.

**pppoe duplicate-protection**

- Use to prevent a client from establishing more than one session using the same MAC address.
- This feature is disabled by default.
- Example  
host1(config-subif)#**pppoe duplicate-protection**
- Use the **no** version to disable duplicate protection.

**pppoe mtu**

- Use to set the MTU using a combination of lower layer restrictions and controls.
- You can specify an MTU greater than the current maximum permitted by RFC 2516, in the range 66–65535.
- You can use the **use-lower-layer** keyword to use the lower layer interface value minus any PPPoE overhead. You can use the **use-mtu-tag** keyword to use the provided PPPoE mtu tag value.
- Example  
host1(config-profile)#**pppoe mtu 1380**
- Use the **no** version to restore the default value, 1494.

**pppoe sessions**

- Use to specify the maximum number of PPPoE subinterfaces permitted on an interface, in the range 1–8000 (ERX routers) or 1–16,000 (E120 and E320 routers). The default value is 8000 (ERX routers) or 16,000 (E120 and E320 routers).
- The **pppoe sessions** command affects only those subinterfaces that you create after issuing this command. Previously created interfaces remain, even if their number exceeds the new value for **pppoe sessions**.
- Example  
host1(config-if)#**pppoe sessions 128**
- Use the **no** version to restore the default value, 8000 (ERX routers) or 16,000 (E120 and E320 routers).



## Configuring PPPoE for Ethernet Modules

You can configure PPPoE on Fast Ethernet (FE), Gigabit Ethernet (GE), and 10-Gigabit Ethernet (10GE) modules. You can configure Ethernet interfaces with IP only, with PPPoE only, with both IP and PPPoE, and with or without VLANs.

This section provides information about configuring PPPoE without VLANs. If you want to configure PPPoE with VLANs, see *JUNOS Physical Layer Configuration Guide, Chapter 5, Configuring Ethernet Interfaces*, which shows common VLAN configurations such as:

- PPPoE over VLAN
- IP over VLAN and PPPoE over VLAN



**NOTE:** *JUNOS Physical Layer Configuration Guide, Chapter 5, Configuring Ethernet Interfaces* provides other non-VLAN configuration examples, such as configurations using MPLS.

For more information about specific Ethernet modules and the protocols and applications they support, see:

- *ERX Module Guide, Appendix A, Module Protocol Support* (for ERX-7xx models, ERX-14xx models, and ERX-310 routers)
- *E120 and E320 Module Guide, Appendix A, IOA Protocol Support* (for E120 routers and E320 routers)

### PPPoE Interface and Subinterface Limits

PPPoE subinterfaces can be distributed in any way across I/O module ports. For example, you can configure the maximum supported number of PPPoE subinterfaces on one port of an FE-2 I/O module and no PPPoE subinterfaces on the other port.

For information about current system maximums supported for PPPoE interfaces and subinterfaces, see *JUNOS Release Notes, Appendix A, System Maximums*.

### Configuring PPPoE Without VLANs

To configure PPPoE over an Ethernet interface without VLANs:

1. Specify a Fast Ethernet, Gigabit Ethernet, or 10-Gigabit Ethernet interface.

```
host1(config)#interface fastEthernet 4/1
```

2. Specify PPPoE as the encapsulation method on the interface.

```
host1(config-if)#pppoe
```

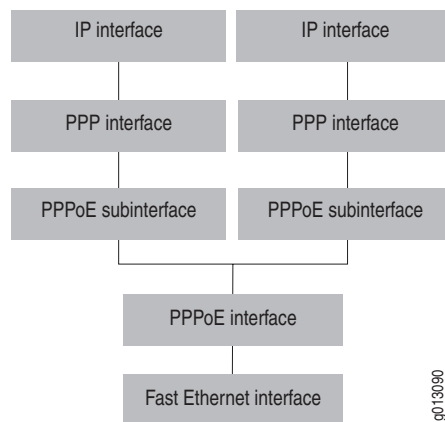
3. Create a PPPoE subinterface.

```
host1(config-if)#pppoe subinterface fastEthernet 4/1.1
```

4. Specify PPP as the encapsulation method on the interface.  
`host1(config-subif)#encapsulation ppp`
5. (Optional) Configure an access concentrator (AC) name on the PPPoE interface.  
`host1(config-subif)#pppoe acname CYM9876`
6. (Optional) Set up the router to prevent a client from establishing more than one session using the same MAC address.  
`host1(config-subif)#pppoe duplicate-protection`
7. Assign an IP address and mask.  
`host1(config-if)#ip address 192.6.129.5 255.255.255.0`
8. (Optional) Configure additional PPPoE subinterfaces by completing Steps 3 through 7 using unique numbering.

Figure 13 illustrates the interface stack for this configuration.

**Figure 13: Example of PPPoE Stacking**



### ***encapsulation ppp***

- Use to specify PPP as the encapsulation method for the interface.
- Example  
`host1(config-if)#encapsulation ppp`
- Use the **no** version to disable PPP on an interface.

**interface fastEthernet**

- Use to select a Fast Ethernet interface.
- For more information, see *JUNOS Physical Layer Configuration Guide, Chapter 5, Configuring Ethernet Interfaces*.
- Example  
host1(config)#**interface fastEthernet 1/0**
- Use the **no** version to remove IP from an interface or subinterface. You must issue the **no** version from the highest level down; you cannot remove an interface or subinterface if the one above it still exists.

**interface gigabitEthernet****interface tenGigabitEthernet**

- Use to select a Gigabit Ethernet interface or a 10-Gigabit Ethernet interface.
- To specify a Gigabit Ethernet interface for ERX-7xx models, ERX-14xx models, and ERX-310 routers, use the *slot/port[.subinterface]* format.
- To specify a Gigabit Ethernet interface or 10-Gigabit Ethernet interface for E120 and E320 routers, use the *slot/adapter/port[.subinterface]* format.
- For more information, see *JUNOS Physical Layer Configuration Guide, Chapter 5, Configuring Ethernet Interfaces*.
- Examples  
host1(config)#**interface gigabitEthernet 1/0**  
host1(config)#**interface gigabitEthernet 4/0/1**  
host1(config)#**interface tenGigabitEthernet 4/0/1**
- Use the **no** version to remove IP from an interface. You must issue the **no** version from the highest level down; you cannot remove an interface or subinterface if the one above it still exists.

**ip address**

- Use to assign an IP address and subnet mask to an interface or subinterface.
- Example  
host1(config-if)#**ip address 192.1.1.1 255.255.255.0**
- Use the **no** version to remove an IP address or disable IP processing.

**pppoe**

- Use to specify PPPoE as the encapsulation method for the interface.
- This command creates a PPPoE major interface.
- Example  
host1(config-if)#**pppoe**
- Use the **no** version to remove the PPPoE major interface.

***pppoe acName***

- Use to configure an access concentrator (AC) name on the PPPoE interface. When the AC (the server) receives a PPPoE Active Discovery Initiation (PADI) packet that it can serve, it replies by sending a PPPoE Active Discovery Offer (PADO) packet. The PADO packet contains the AC name configured using this command.
- If the AC name is not configured, the router name is used.
- The AC name can be a maximum of 64 characters.
- Example  
host1(config-subif)#**pppoe acName CYM9876**
- Use the **no** version to remove the AC name.

***pppoe duplicate-protection***

- Use to prevent a client from establishing more than one session using the same MAC address.
- This feature is disabled by default.
- Example  
host1(config-subif)#**pppoe duplicate-protection**
- Use the **no** version to disable duplicate protection.

***pppoe subinterface fastEthernet***

- Use to create a PPPoE subinterface on a Fast Ethernet module.
- On ERX-7xx models, ERX-14xx models, and the ERX-310 router, use the *slot/port/pppoeSubinterface* format.
- Example  
host1(config)#**pppoe subinterface fastEthernet 4/1.1**
- Use the **no** version to remove the PPPoE subinterface.

**Configuring PADM Messages**

You can configure PPPoE to issue and display a PPPoE Active Discovery Message (PADM). The PADM message is a control message that servers send to clients. The clients may act on the control message, but are not required to do so. There are two types of PADM messages:

- Message of the minute (MOTM)—Informs clients of interesting system information
- URL—Typically spawns an Internet browser with the specified URL as the initial page

You can configure the router to send PADM messages as follows:

- Send MOTM messages to all clients connected to the router.
- Send MOTM and URL messages to all clients connected to a subinterface.
- Configure profiles to send MOTM and URL messages to new clients created when the profile is dynamically attached to an IP interface.



**NOTE:** You can use the **pppoe motm** command at three different points in the configuration process: Privileged Exec, Interface Configuration, and Profile Configuration modes. You can use the **pppoe url** command at two different points in the configuration process: Interface Configuration and Profile Configuration modes. Note the differences described in guidelines below.

#### **pppoe motm**

- Use to cause the PPPoE application to send a PADM message of the minute (MOTM) message to all PPPoE clients connected to the router. The MOTM string is passed with no changes.
- The message string is not saved in nonvolatile storage (NVS).
- Use in Privileged Exec mode.
- Example  
host1#**pppoe motm Router going down at 10:00 p.m.**
- Use the **no** version to disable the message.

#### **pppoe motm**

- Use in the context of a PPPoE subinterface to cause the PPPoE application to send the specified PADM message to the client as it is configured (if connected).
- The message is also sent whenever the subinterface transitions from down to up.
- The message string is saved in nonvolatile storage (NVS).
- Use in Interface Configuration mode.
- Example  
host1(config-if)#**interface fastEthernet 1/0.1.1**  
host1(config-if)#**pppoe motm Router going down at 10:00 p.m.**
- Use the **no** version to disable the message.

#### **pppoe motm**

- Use in a profile to cause the PPPoE application to send the string to the new client that is created when the profile is dynamically attached to an IP interface.
- The message string is saved in nonvolatile storage (NVS).
- Use in Profile Configuration mode.

- Example  
host1(config-profile)#**pppoe motm Router going down now**
- Use the **no** version to disable the message.

**pppoe url**

- Use in the context of a PPPoE subinterface to cause the PPPoE application to send the specified PADM message to the client as it is configured (if connected).
- The message is also sent whenever the subinterface transitions from down to up.
- The message string is saved in nonvolatile storage (NVS).
- Use in Interface Configuration mode.
- Example  
host1(config-if)#**interface fastEthernet 1/0.1.1**  
host1(config-if)#**pppoe url http://www.relevanturl.com**
- Use the **no** version to disable the message.

**pppoe url**

- Use in a profile to cause the PPPoE application to send the string to the new client that is created when the profile is dynamically attached to an IP interface.
- The message string is saved in nonvolatile storage (NVS).
- PPPoE substitutes the following characters for information in the specified URL string before transmitting:
  - %U user and domain name
  - %u user name
  - %d domain name
  - %D profile name
  - %% % character
- Use in Profile Configuration mode.
- Example  
host1(config-profile)#**pppoe url http://www.relevanturl.com**
- Use the **no** version to disable the message.

## Configuring PADN Messages

You can configure PPPoE to receive PPPoE Active Discovery Network (PADN) messages. When a client connects to a PPPoE server, such as an E-series router, the client receives configuration information from the server via the PADN message. This PADN information associates the PPPoE sessions with a set of routes. The client can use this set of routes to determine which session to use based on the destination IP address.

The PADN packet data is relevant only when the PPP network layer is “up.” To reach an up state, PPP alerts PPPoE after the Network Control Protocol (NCP) completes negotiation.

The routes of interest can be maintained on the router in domain maps.



**NOTE:** For information about domain mapping, see *JUNOS Broadband Access Configuration Guide, Chapter 1, Configuring Remote Access*.

### **aaa domain-map**

- Use to map a domain name between a PPP client’s domain name and a virtual router.
- Example
 

```
host1(config)#aaa domain-map xyz.com
host1(config-domain-map)#padn 10.2.25.6 255.255.255.0 10
host1(config-domain-map)#padn 20.2.0.0 255.255.0.0 11
```
- Use the **no** version to delete the map entry.

### **padn**

- Use to configure PADN parameters for a domain name.
- You may send up to a maximum of 16 PADNs per domain name.
- Example
 

```
host1(config-domain-map)#padn 10.2.25.6 255.255.255.255 13
```
- Use the **no** version to delete PADN parameters for the domain name.

## Configuring PPPoE Service Name Tables

To configure PPPoE service name tables on the router:

1. Create the PPPoE service name table.
2. (Optional) Add entries to populate the PPPoE service name table. You can:
  - Configure specific service names to represent custom values.
  - Specify a nondefault action for the empty service name entry.
3. Enable the PPPoE service name table for use with a static or dynamic interface.

The following sections describe how to perform these tasks.

### Creating and Populating PPPoE Service Name Tables

To create and populate a PPPoE service name table on the router:

1. From Global Configuration mode, create a PPPoE service name table by assigning it a name.

```
host1(config)#pppoe-service-name-table myServiceTable1
```

This command accesses PPPoE Service Name Table Configuration mode and builds a default PPPoE service name table named `myServiceTable1`. The table contains a single empty service name entry associated with the default action, `terminate`, as shown in Table 17. With no further service name entries, this table directs the router to respond to all PADI requests containing an empty service name tag.

**Table 17: Default PPPoE Service Name Table**

Service-Name	Action
" "	Terminate

2. (Optional) From PPPoE Service Name Table Configuration mode, create entries to populate the PPPoE service name table. You can configure up to 16 specific service name entries per table, or modify the action for the empty service name tag.

```
host1(config-pppoe-service-name-table)#service myISPService
host1(config-pppoe-service-name-table)#service myQOSClass1
host1(config-pppoe-service-name-table)#service myQOSClass2
host1(config-pppoe-service-name-table)#service empty-service-name drop
```



These commands build the PPPoE service name table shown in Table 18. This table directs the router to send a PADO packet in response to all PADI requests containing the myISPService, myQOSClass1, or myQOSClass2 service name tag, and to ignore (drop) all PADI requests containing empty service name tags.

**Table 18: PPPoE Service Name Table with Entries**

Service-Name	Action
"myISPService"	Terminate
"myQOSClass1"	Terminate
"myQOSClass2"	Terminate
" "	Drop

3. Exit PPPoE Service Name Table Configuration mode.

```
host1(config-pppoe-service-name-table)#exit
```

4. (Optional) Use the appropriate **show** command to verify the creation of the PPPoE service name table and entries.

```
host1(config)#show pppoe-service-name-table name myServiceTable1
```

5. (Optional) Repeat Steps 1 through 4 to configure additional PPPoE service name tables on the router.

### **pppoe-service-name-table**

- Use from Global Configuration mode to create a PPPoE service name table.
- You can create a maximum of 16 PPPoE service name tables per E-series router.
- Specify a table name of up to 31 alphanumeric characters.
- This command accesses PPPoE Service Name Table Configuration mode, which enables you to configure entries for the PPPoE service name table.
- Example  

```
host1(config)#pppoe-service-name-table myServiceTable1
```
- Use the **no** version to remove the specified PPPoE service name table from the router.

### **service**

- Use to add a specific service name tag to a PPPoE service name table, or to modify the action for the empty service name tag in a PPPoE service name table.
- Each PPPoE service name table includes one empty service name tag, and can optionally include up to 16 additional specific service name entries.
- For each specific service name tag that you configure, assign a name of up to 31 alphanumeric characters.
- You cannot configure the action for a specific service name tag; the default action, terminate, is always used.

- For an empty service name tag, you can specify that the AC, such as an E-series router, ignore (drop), rather than respond to (terminate), all PADI requests from the client that contain an empty service name tag.
- Examples
 

```
host1(config-pppoe-service-name-table)#service myISPService
host1(config-pppoe-service-name-table)#service empty-service-name drop
```
- Use the **no** version to restore the default action, terminate, for an empty service name tag, or to remove the specified non-empty service name tag from the PPPoE service name table.

### ***Enabling PPPoE Service Name Tables for Use with Static Interfaces***

To enable a PPPoE service name table for use with a static interface, assign the service name table to the PPPoE major interface.

#### **PPPoE over ATM Configurations**

To enable a PPPoE service name table for use with a static interface in PPPoE over ATM configurations:

1. Configure an ATM physical interface.
 

```
host1(config)#interface atm 3/0
```
2. Configure an ATM 1483 subinterface.
 

```
host1(config-if)#interface atm 3/0.1
```
3. Configure an ATM PVC by specifying the VCD, the VPI, the VCI, and the encapsulation type.
 

```
host1(config-subif)#atm pvc 10 100 22 aal5snap
```
4. Select PPPoE as the encapsulation method on the interface. This command creates the PPPoE major interface.
 

```
host1(config-subif)#encapsulation pppoe
```
5. Assign the PPPoE service name table to the PPPoE major interface.
 

```
host1(config-subif)#pppoe service-name-table myServiceTable1
```

#### ***atm pvc***

- Use to configure a PVC on an ATM interface.
- For details about specifying the mandatory VCD, VPI, VCI, and encapsulation type parameters, see **atm pvc** on page 250.
- Example
 

```
host1(config-if)#atm pvc 10 100 22 aal5snap
```
- Use the **no** version to remove the specified PVC.

**encapsulation pppoe**

- Use to specify PPPoE as the encapsulation method for the interface.
- This command creates a PPPoE major interface.
- Example  

```
host1(config-subif)#encapsulation pppoe
```
- Use the **no** version to disable PPPoE on an interface.

**interface atm**

- Use to configure an ATM interface.
- For information about specifying the ATM interface or subinterface, see **interface atm** on page 251.
- Examples  

```
host1(config)#interface atm 3/1.19  
host1(config)#interface atm 3/0/1.19
```
- Use the **no** version to remove the interface or subinterface.

**pppoe service-name-table**

- Use from Subinterface Configuration mode to assign a PPPoE service name table to a PPPoE major interface for use by a static ATM 1483 subinterface.
- Specify the name of the PPPoE service name table configured with the **pppoe-service-name-table** command from Global Configuration mode.
- Example  

```
host1(config-subif)#pppoe service-name-table myServiceTable1
```
- Use the **no** version to remove the PPPoE service name table assignment.

**PPPoE over Ethernet Configurations**

To enable a PPPoE service name table for use with a static interface in PPPoE over Ethernet configurations:

1. Configure a Fast Ethernet, Gigabit Ethernet, or 10-Gigabit Ethernet physical interface.

```
host1(config)#interface fastEthernet 4/1
```

2. Select PPPoE as the encapsulation method on the interface. This command creates the PPPoE major interface.

```
host1(config-if)#pppoe
```

3. Assign the PPPoE service name table to the PPPoE major interface.

```
host1(config-if)#pppoe service-name-table myServiceTable1
```

**interface fastEthernet**

- Use to select a Fast Ethernet interface.
- Example  
host1(config)#**interface fastEthernet 4/1**
- Use the **no** version to remove IP from an interface or subinterface. You must issue the **no** version from the highest level down; you cannot remove an interface or subinterface if the one above it still exists.

**interface gigabitEthernet****interface tenGigabitEthernet**

- Use to select a Gigabit Ethernet interface or a 10-Gigabit Ethernet interface.
- For information about specifying the Gigabit Ethernet or 10-Gigabit Ethernet interface or subinterface, see **interface gigabitEthernet** and **interface tenGigabitEthernet** on page 255.
- Examples  
host1(config)#**interface gigabitEthernet 1/0**  
host1(config)#**interface gigabitEthernet 4/0/1**  
host1(config)#**interface tenGigabitEthernet 4/0/1**
- Use the **no** version to remove IP from an interface. You must issue the **no** version from the highest level down; you cannot remove an interface or subinterface if the one above it still exists.

**pppoe**

- Use to specify PPPoE as the encapsulation method for the interface.
- This command creates a PPPoE major interface.
- Example  
host1(config-if)#**pppoe**
- Use the **no** version to remove the PPPoE major interface.

**pppoe service-name-table**

- Use from Interface Configuration mode to assign a PPPoE service name table to a PPPoE major interface for use by a static Fast Ethernet, Gigabit Ethernet, or 10-Gigabit Ethernet interface.
- Specify the name of the PPPoE service name table configured with the **pppoe-service-name-table** command from Global Configuration mode.
- Example  
host1(config-if)#**pppoe service-name-table myServiceTable1**
- Use the **no** version to remove the PPPoE service name table assignment.

## Enabling PPPoE Service Name Tables for Use with Dynamic Interfaces

To enable a PPPoE service name table for use with a dynamic interface, add the service name table to a profile that is dynamically assigned to the interface.

For complete details, see *Configuring a Dynamic Interface from a Profile* in *Chapter 12, Configuring Dynamic Interfaces*.

To enable a PPPoE service name table for use with a dynamic interface:

1. Create a profile by assigning it a name.

```
host1(config)#profile baseProfile
```

2. Assign the PPPoE service name table to the profile as a PPPoE characteristic.

```
host1(config-profile)#pppoe service-name-table myServiceTable1
```

3. Exit Profile Configuration mode.

```
host1(config-profile)#exit
```

4. Configure a physical interface.

On ERX-7xx models, ERX-14xx models, and the ERX-310 router:

```
host1(config-if)#interface atm 3/0.1
```

5. Configure an ATM PVC by specifying the VCD, the VPI, the VCI, and the encapsulation type.

```
host1(config-subif)#atm pvc 10 100 22 aal5snap
```

6. Apply the profile to the interface.

```
host1(config-subif)#profile pppoe baseProfile
```

7. Enable the PPPoE dynamic encapsulation type.

```
host1(config-subif)#auto-configure pppoe
```

### **atm pvc**

- Use to configure a PVC on an ATM interface.
- For details about specifying the mandatory VCD, VPI, VCI, and encapsulation type parameters, see **atm pvc** on page 250.

- Example

```
host1(config-if)#atm pvc 10 100 22 aal5snap
```

- Use the **no** version to remove the specified PVC.

**auto-configure**

- Use to configure an ATM 1483 subinterface to support a dynamic interface. Specifies the type(s) of dynamic encapsulation that will be accepted/detected by the ATM 1483 subinterface.
- This command causes the layers above ATM 1483 to become dynamic.
- Select **pppoe** as the dynamic next upper interface type.
- Example  

```
host1(config-subif)#auto-configure pppoe
```
- Use the **no** version to disable detection of the specified encapsulation.

**interface atm**

- Use to configure an ATM interface.
- For information about specifying the ATM interface or subinterface, see **interface atm** on page 251.
- Examples  

```
host1(config)#interface atm 3/0.1
host1(config)#interface atm 3/0/0.1
```
- Use the **no** version to remove the interface or subinterface.

**pppoe service-name-table**

- Use from Profile Configuration mode to assign a PPPoE service name table to a profile for use by the dynamic PPPoE interface column associated with the profile.
- Specify the name of the PPPoE service name table configured with the **pppoe-service-name-table** command from Global Configuration mode.
- Example  

```
host1(config-profile)#pppoe service-name-table myServiceTable1
```
- Use the **no** version to remove the PPPoE service name table assignment.

**profile**

- Use from Global Configuration mode to create a profile name of up to 80 characters.
- Use from Subinterface Configuration mode to assign a profile to an interface. Specify **pppoe** as the encapsulation type to which the profile applies.
- Examples  

```
host1(config)#profile myProfile
host1(config-subif)#profile pppoe myProfile
```
- Use the **no** version to remove a profile (from Global Configuration mode) or to remove the profile assignment (from Subinterface Configuration mode).

## Configuring PADS Packet Content

---

By default, an E-series router acting as an AC sends both the AC-Name and AC-Cookie tags as part of the PADS packet when it confirms a session with a PPPoE client. These tags are defined in RFC 2516 as follows:

- AC-Name—String that uniquely identifies the particular AC
- AC-Cookie—Tag used by the AC to help protect against denial of service (DoS) attacks

If necessary for compatibility with your network equipment, you can issue the **pppoe pads disable-ac-info** command to prevent the router from sending the AC-Name and AC-Cookie tags in the PADS packet.

### ***pppoe pads disable-ac-info***

- Use to prevent the router from sending the AC-Name and AC-Cookie tags in the PADS packet.
- The **pppoe pads disable-ac-info** command affects PADS packets sent only on PPPoE interfaces configured on the router after the command is issued. It has no effect on PADS packets sent on previously created PPPoE interfaces.
- Example  
host1(config)#**pppoe pads disable-ac-info**
- Use the **no** version to restore the default behavior, which is to send the AC-Name and AC-Cookie tags in the PADS packet.

## Configuring PPPoE Remote Circuit ID Capture

---

To capture and use the PPPoE remote circuit ID:

1. Configure a static or dynamic PPPoE interface.

For instructions on configuring a static PPPoE interface, see *Configuring PPPoE over ATM* on page 247 or *Configuring PPPoE for Ethernet Modules* on page 253.

For instructions on configuring a dynamic PPPoE interface, see *Chapter 12, Configuring Dynamic Interfaces*.

2. Configure capture of the PPPoE remote circuit ID on this interface.
  - a. Enable the router to capture the PPPoE remote circuit ID transmitted from the DSLAM by using one of the following methods:

- For a static PPPoE interface, issue the **pppoe remote-circuit-id** command from Interface Configuration mode or Subinterface Configuration mode.

```
host1(config-if)#pppoe remote-circuit-id
```

- For a dynamic PPPoE interface, issue the **pppoe remote-circuit-id** command from Profile Configuration mode as a characteristic of the profile assigned to the dynamic PPPoE interface column.

```
host1(config)#profile pppoeTest  
host1(config-profile)#pppoe remote-circuit-id
```

By default, the router formats the captured PPPoE remote circuit ID to include only the agent-circuit-id suboption (suboption 1) of the PPPoE intermediate agent tags sent from the DSLAM.

- b. (Optional) Use the **show pppoe interface** command (for static PPPoE interfaces) or the **show profile** command (for dynamic PPPoE interfaces) to verify that PPPoE remote circuit capture is enabled.

```
host1#show pppoe interface fastEthernet 4/1.1  
host1#show profile name pppoeTest
```

For information about how to use these commands, see **show pppoe interface** on page 275 and **show profile** on page 283.



3. (Optional) Configure the format of the captured PPPoE remote circuit ID value.

- a. Configure RADIUS to specify a nondefault format for the PPPoE remote circuit ID value.

- For example, the following command formats the PPPoE remote circuit ID to include only the agent-remote-id suboption (suboption 2) of the tags supplied by the PPPoE intermediate agent.

```
host1(config)#radius remote-circuit-id-format agent-remote-id
```

- The following command formats the PPPoE remote circuit ID to include the NAS-Identifier [32] RADIUS attribute with both the agent-circuit-id and agent-remote-id suboptions of the tags supplied by the PPPoE intermediate agent.

```
host1(config)#radius remote-circuit-id-format nas-identifier
agent-circuit-id agent-remote-id
```

- The following command formats the PPPoE remote circuit ID to append the agent-circuit-ID suboption to an interface specifier that is consistent with the recommended format in the DSL Forum Technical Report (TR)-101—Migration to Ethernet-Based DSL Aggregation (April 2006). For details about how the router implements this format, see *Format for dsl-forum-1 Keyword* on page 242.

```
host1(config)#radius remote-circuit-id-format dsl-forum-1
```

- b. Configure RADIUS to specify a nondefault delimiter character to separate components in the PPPoE remote circuit ID value. (The default delimiter character is #.)

```
host1(config)#radius remote-circuit-id-delimiter %
```

- c. Use the **show radius remote-circuit-id format** command and the **show radius remote-circuit-id-delimiter** command to verify the format and delimiter settings for the PPPoE remote circuit ID value.

```
host1#show radius remote-circuit-id-format
host1#show radius remote-circuit-id-delimiter
```

For information about how to use these commands, see **show radius remote-circuit-id-format** on page 287 and **show radius remote-circuit-id-delimiter** on page 287.

4. Send the PPPoE remote circuit ID value to a RADIUS server, to an LNS, or to both.
  - a. Configure RADIUS to use the PPPoE remote circuit ID captured from the DSLAM in place of either (or both) of the Calling-Station-Id [31] and NAS-Port-Id [87] RADIUS attributes.

```
host1(config)#radius override calling-station-id remote-circuit-id
host1(config)#radius override nas-port-id remote-circuit-id
```

- b. Configure the E-series L2TP access controller (LAC) to generate L2TP Calling Number AVP 22 in fixed format or one of several formats that includes either or both of the agent-circuit-id (suboption 1) and agent-remote-id (suboption 2) suboptions of the tags supplied by the PPPoE intermediate agent.

```
host1(config)#aaa tunnel calling-number-format fixed
or
host1(config)#aaa tunnel calling-number-format descriptive
include-agent-circuit-id include-agent-remote-id
or
host1(config)#aaa tunnel calling-number-format include-agent-circuit-id
```

- c. (Optional) Configure a fallback format for the L2TP Calling Number AVP 22. The fallback format is used only when you have configured the calling number format as anything other than fixed and the PPPoE agent ID is null or unavailable.

```
host1(config)#aaa tunnel calling-number-format fallback fixed
or
host1(config)#aaa tunnel calling-number-format fallback descriptive
```

- d. (Optional) Use the **show radius override** command to verify the override settings configured for RADIUS, and the **show aaa tunnel-parameters** command to verify the parameters configured for L2TP tunnel definitions.

```
host1#show radius override
host1#show aaa tunnel-parameters
```

For information about how to use these commands, see **show radius override** on page 286 and **show aaa tunnel-parameters** on page 275.

### **aaa tunnel calling-number-format**

- Use to configure the format used by the E-series LAC to generate the L2TP Calling Number AVP 22.
- The fixed format is similar to the fixed format of RADIUS attribute 31 (Calling-Station-Id). The LAC uses this format in ICRQ packets that it sends to the LNS.
- Several different descriptive formats include information about the interface and either or both of the suboptions supplied by the PPPoE intermediate agent, agent-circuit-id and agent-remote-id.

- Several simpler formats include only either or both of the PPPoE suboptions, agent-circuit-id and agent-remote-id.
- Example 1  

```
host1(config)#aaa tunnel calling-number-format descriptive
include-agent-circuit-id
```
- Example 2  

```
host1(config)#aaa tunnel calling-number-format descriptive
include-agent-circuit-id include-agent-remote-id
```
- Example 3  

```
host1(config)#aaa tunnel calling-number-format include-agent-circuit-id
```
- Use the **no** version to restore the default calling number format, descriptive.

#### **aaa tunnel calling-number-format-fallback**

- Use to configure the fallback format that the E-series LAC uses to generate the L2TP Calling Number AVP 22 in the event that the PPPoE agent ID is null or unavailable.
- The fallback format is used only when the configured calling number format includes either or both of the agent-circuit-id and agent-remote-id.
- The calling number format determines what element triggers use of the fallback format:

Calling Number Format	Fallback Trigger
agent-circuit-id	agent-circuit-id is empty
agent-circuit-id include-agent-remote-id	Both agent-circuit-id and agent-remote-id are empty.
agent-remote-id	agent-remote-id is empty
descriptive include-agent-circuit-id	agent-circuit-id is empty
descriptive include-agent-circuit-id include-agent-remote-id	Both agent-circuit-id and agent-remote-id are empty.
descriptive include-agent-remote-id	agent-remote-id is empty

- You can specify either descriptive format or fixed format.
- Example  

```
host1(config)#aaa tunnel calling-number-format-fallback fixed
```
- Use the **no** version to restore the default format, descriptive.

#### **pppoe remote-circuit-id**

- Use to enable a static PPPoE interface (from Interface Configuration mode or Subinterface Configuration mode) or a dynamic PPPoE interface (from Profile Configuration mode) to capture and process a vendor-specific tag containing a remote circuit ID transmitted from a DSLAM.
- The router can then send this value to a RADIUS server or to an L2TP network server (LNS) to uniquely identify subscriber locations.

- Examples

```
host1(config-if)#pppoe remote-circuit-id
host1(config-profile)#pppoe remote-circuit-id
```

- Use the **no** version to restore the default behavior, which is not to capture and process the PPPoE remote circuit ID.

#### ***radius override calling-station-id remote-circuit-id***

- Use to configure RADIUS to override the standard use of the Calling-Station-Id [31] RADIUS attribute and instead use the PPPoE remote circuit ID transmitted from a DSLAM.

- Example

```
host1(config)#radius override calling-station-id remote-circuit-id
```

- Use the **no** version to restore the default Calling-Station-Id value, which is the telephone number from which the call originated.

#### ***radius override nas-port-id remote-circuit-id***

- Use to configure RADIUS to override the standard use of the NAS-Port-Id [87] RADIUS attribute and instead use the PPPoE remote circuit ID transmitted from a DSLAM.

- Example

```
host1(config)#radius override nas-port-id remote-circuit-id
```

- Use the **no** version to restore the default NAS-Port-Id value, which is the physical interface of the network access server (NAS) that is authenticating the user.

#### ***radius remote-circuit-id-delimiter***

- Use to configure the delimiter character that the router uses to set off multiple components in the format of the PPPoE remote circuit ID value captured from a DSLAM.

- Example

```
host1(config)#radius remote-circuit-id-delimiter !
```

- Use the **no** version to restore the default delimiter character, #.

#### ***radius remote-circuit-id-format***

- Use to configure the format of the PPPoE remote circuit ID value captured from a DSLAM.
- By default, the router formats the PPPoE remote circuit ID to include only the agent-circuit-id suboption (suboption 1) of the tags supplied by the PPPoE intermediate agent.

- You can use this command to configure one of the following nondefault formats for the PPPoE remote circuit ID value:
  - To include the agent-circuit-id suboption, use the **agent-circuit-id** keyword.
  - To include the agent-remote-id suboption (suboption 2) of the tags supplied by the PPPoE intermediate agent, use the **agent-remote-id** keyword.
  - To include the NAS-Identifier [32] RADIUS attribute, use the **nas-identifier** keyword. If you include the **nas-identifier** keyword, you must also include either or both of the **agent-circuit-id** and **agent-remote-id** keywords.
  - To append the agent-circuit-ID value to an interface specifier that is consistent with the recommended format in the DSL Forum Technical Report (TR)-101—Migration to Ethernet-Based DSL Aggregation (April 2006), use the **dsl-forum-1** keyword. For details about how the router implements this format, see *Format for dsl-forum-1 Keyword* on page 242.
- RADIUS overrides the standard use of the Calling-Station-Id [31] or NAS-Port-Id [87] attribute with the PPPoE remote circuit ID only if the DSLAM transmits non-empty data for at least one of the agent-circuit-id or agent-remote-id values. If the DSLAM transmits empty data, then RADIUS does not override the Calling-Station-Id [31] or NAS-Port-Id [87] RADIUS attribute with the PPPoE remote circuit ID and instead uses the standard value for the RADIUS attribute.
- If a single component in a multi-component PPPoE remote circuit ID format is empty, the router represents the empty component as two consecutive delimiter characters (## by default).
- Example 1—Formats the PPPoE remote circuit ID value to include only the agent-remote-id suboption of the tags supplied by the PPPoE intermediate agent.  
 host1(config)#**radius remote-circuit-id-format agent-remote-id**
- Example 2—Formats the PPPoE remote circuit ID value to include both the agent-circuit-id and agent-remote-id suboptions of the tags supplied by the PPPoE intermediate agent.  
 host1(config)#**radius remote-circuit-id-format agent-circuit-id agent-remote-id**
- Example 3—Formats the PPPoE remote circuit ID value to include the NAS-Identifier [32] RADIUS attribute with the agent-circuit-id suboption of the tags supplied by the PPPoE intermediate agent.  
 host1(config)#**radius remote-circuit-id-format nas-identifier agent-circuit-id**
- Example 4—Formats the PPPoE remote circuit ID value to include the NAS-Identifier [32] RADIUS attribute with the agent-remote-id suboption of the tags supplied by the PPPoE intermediate agent.  
 host1(config)#**radius remote-circuit-id-format nas-identifier agent-remote-id**

- Example 5—Formats the PPPoE remote circuit ID value to include the NAS-Identifier [32] RADIUS attribute with both the agent-circuit-id and agent-remote-id suboptions of the tags supplied by the PPPoE intermediate agent.

```
host1(config)#radius remote-circuit-id-format nas-identifier agent-circuit-id
agent-remote-id
```

- Example 6—Formats the PPPoE remote circuit ID value to use the format for the **dsl-forum-1** keyword. For details about how the router implements this format, see *Format for dsl-forum-1 Keyword* on page 242.

```
host1(config)#radius remote-circuit-id-format dsl-forum-1
```

- Use the **no** version to restore the default format, agent-circuit-id.

## Monitoring PPPoE

Use the commands described in this section to display information about PPPoE interfaces and subinterfaces.

You can set a statistics baseline for PPPoE interfaces, subinterfaces, and circuits using the **baseline pppoe interface** command.

You can use the output filtering feature of the **show** command to include or exclude lines of output based on a text string you specify. See *JUNOS System Basics Configuration Guide, Chapter 2, Command-Line Interface* for details.



**NOTE:** The E120 router and E320 router output for **monitor** and **show** commands is identical to output from other E-series routers, except that the E120 and E320 router output also includes information about the adapter identifier in the interface specifier (*slot/adapter/port*).

### **baseline pppoe interface**

- Use to set a statistics baseline for PPPoE interfaces, subinterfaces, and circuits.
- The router implements the baseline by reading and storing the statistics at the time the baseline is set and then subtracting this baseline whenever baseline-relative statistics are retrieved.
- You cannot set a baseline for groups of interfaces, subinterfaces, or circuits. You must set them one at a time.
- When baselining is requested, the time since the last baseline was set is displayed in *hours:minutes:seconds* or *days/hours* format. If a baseline has not been set, the message “No baseline has been set” is displayed instead.
- Use the optional **delta** keyword with PPPoE **show** commands to specify that baselined statistics will be shown.
- Examples
 

```
host1#baseline pppoe interface atm 2/0.1.1
host1#baseline pppoe interface atm 2/0/0.1.1
```
- There is no **no** version.

**show aaa tunnel-parameters**

- Use to display tunnel parameters that are configured for L2TP tunnel definitions, including the calling number format.
- Field descriptions
  - Tunnel password—Default tunnel password
  - Tunnel client-name—Hostname that the LAC sends to the LNS when communicating about the tunnel
  - Tunnel nas-port-method—Default NAS port type
  - Tunnel nas-port ignore—Whether the router uses the tunnel peer's NAS-Port [5] attribute; enabled or disabled
  - Tunnel nas-port-type ignore—Whether the router uses the tunnel peer's NAS-Port-Type [61] attribute; enabled or disabled
  - Tunnel assignmentId format—Value of the tunnel assignment ID that is passed to PPP/L2TP
  - Tunnel calling number format—Format configured for L2TP Calling Number AVP 22 generated by the LAC
- Example

```

host1#show aaa tunnel-parameters
Tunnel password is 3&92k5b#q4
Tunnel client-name is host1
Tunnel nas-port-method is none
Tunnel nas-port ignore disabled
Tunnel nas-port-type ignore disabled
Tunnel assignmentId format is assignmentId
Tunnel calling number format is descriptive, includes agent-circuit-id and
agent-remote-id

```

**show pppoe interface**

- Use to display parameters on a PPPoE interface or a PPPoE subinterface.
- If you do not specify an interface and subinterface, the router displays the PPPoE interface and Status parameters for all configured interfaces.
- If you specify an interface with no subinterface, the router displays the PPPoE interface and Status parameters for that interface.
- If you specify an interface and subinterface, the router displays detailed parameters available for that subinterface.
- Field descriptions
  - PPPoE interface—Interface identifier. For more information about specifying the physical interface, see *Interface Types and Specifiers* in *JUNOS Command Reference Guide, About This Guide*.
  - Status—Operational status of the interface; possible values are:
    - operStatusUp—Interface or subinterface is operational
    - Down—Interface or subinterface is not operational
    - LowerLayerDown—Subinterface is not operational because an underlying interface is down

- full—Displays configuration, status, and statistics information
- max sessions—Number of maximum allowable PPP sessions configured
- mtu—Maximum transfer unit (MTU) value; when derived from the PPPoE MTU tag, the value can only be determined from an active session.
- acName—Name of PPPoE access concentrator
- will not send ac info in PADS packet—When the **pppoe pads disable-ac-info** command is issued, indicates that the router does not send the AC-Name and AC-Cookie tags in the PADS packet
- duplicate-protection—Whether duplicate protection is enabled or disabled for the interface
- capture remote circuit id—Whether capture of the PPPoE remote circuit ID sent from the DSLAM is enabled or disabled for the interface
- active connections—Number of live PPP connections
- configured subinterfaces—Number of PPPoE subinterfaces you configured on an interface
- Assigned profile—Name of profile assigned to dynamic PPPoE interface
- PPPoE Statistics Counters
  - PADI received/PADI transmitted—Number of initiation control packets received/transmitted
  - PADO received/PADO transmitted—Number of offer control packets received/transmitted
  - PADR received/PADR transmitted—Number of request control packets received/transmitted
  - PADS received/PADS transmitted—Number of session confirmation control packets received/transmitted
  - PADT received/PADT transmitted—Number of termination control packets received/transmitted
  - PADM received/PADM transmitted—Number of message control packets received/transmitted
  - PADN received/PADN transmitted—Number of network control packets received/transmitted
- PAD packets received—Total number of control packets received on the interface
- PAD packets transmitted—Total number of control packets transmitted on the interface
- Invalid PAD Packets
  - Invalid Version—Number of control packets received with an invalid version
  - Invalid PAD Code—Number of control packets received with an invalid code
  - Invalid PAD Tags—Number of control packets received with invalid tags



- ❑ Invalid PAD Tag length—Number of control packets received with an invalid tag length
- ❑ Invalid PAD Type—Number of control packets received with an invalid type
- ❑ Invalid PADI Session—Number of invalid PPPoE Active Discovery Initiation sessions
- ❑ Invalid PADR Session—Number of invalid PPPoE Active Discovery Request sessions
- ❑ Invalid PAD packet length—Number of control packets received with an invalid packet length
- ❑ Invalid PAD packets—Number of invalid control packets received
- Total Invalid PAD packets—Total number of invalid control packets received on the interface
- Insufficient Resources—Number of requests denied because of an inadequate number of sessions; check the number of active clients
- Lockout Configuration (seconds)—Encapsulation type lockout settings for the PPPoE client associated with the dynamic PPPoE subinterface column; for more information about these fields, see *Configuring Encapsulation Type Lockout for PPPoE Clients* in *Chapter 12, Configuring Dynamic Interfaces*
  - ❑ Min—Minimum lockout time, in seconds
  - ❑ Max—Maximum lockout time, in seconds
  - ❑ Total clients in active lockouts—Number of PPPoE clients currently undergoing dynamic encapsulation type lockout
  - ❑ Total clients in lockout grace period—Number of PPPoE clients currently in a lockout grace period

■ Example 1

```
host1#show pppoe interface atm 1/0.1
```

```
PPPoE interface ATM 1/0.1 is operStatusUp (dynamic)
  PPPoE interface ATM 1/0.1 has max sessions = 4000
  PPPoE interface ATM 1/0.1 has acName of 11111111111111
  PPPoE interface ATM 1/0.1 will not send ac info in PADS packet
  PPPoE interface ATM 1/0.1 is in duplicate-protection
  PPPoE interface ATM 1/0.1 will capture remote circuit ID
  PPPoE interface ATM 1/0.1 has 1 active connections,
    out of 1 configured subinterfaces
Assigned profile (any)           : baseProfile
PPPoE Statistics
Counters:
  PADI received      0
  PADI transmitted   1
  PADO received      1
  PADO transmitted   0
  PADR received      0
  PADR transmitted   1
  PADS received      1
  PADS transmitted   0
  PADT received      0
  PADT transmitted   0
  PADM received      1
  PADM transmitted   0
  PADN received      0
```

```

PADN transmitted      0
PAD packets received  2
PAD packets transmitted 2
Invalid PAD Packets:
  Invalid Version      0
  Invalid PAD Code     0
  Invalid PAD Tags     0
  Invalid PAD Tag length 0
  Invalid PAD Type     0
  Invalid PADI Session 0
  Invalid PADR Session 0
  Invalid PAD packet length 3
  Invalid PAD packets  0
Total Invalid PAD packets 3

Insufficient Resources 0
Lockout Configuration (seconds): Min 5, Max 60
Total clients in active lockouts: 0
Total clients in lockout grace period: 0

```

■ Example 2—Uses the default MTU value (1494)

```

host1#show pppoe interface full
PPPoE interface FastEthernet 2/0 is operStatusUp
  PPPoE interface FastEthernet 2/0 has max sessions = 8000
  PPPoE interface FastEthernet 2/0 mtu 1494
  PPPoE interface FastEthernet 2/0 has no acName set
  PPPoE interface FastEthernet 2/0 autoconfigured subinterfaces
  PPPoE interface FastEthernet 2/0 has 1 active connections,
    out of 1 configured subinterfaces
Assigned profile (any)      : pppoetest
PPPoE Statistics
Counters:
  PADI received      42
  PADI transmitted   0
  PADO received      0
  PADO transmitted   8
  PADR received      8
  PADR transmitted   0
  PADS received      0
  PADS transmitted   8
  PADT received      0
  PADT transmitted   7
  PADM received      0
  PADM transmitted   0
  PADN received      0
  PADN transmitted   0
PAD packets received      50
PAD packets transmitted   23

Invalid PAD Packets:
  Invalid Version      0
  Invalid PAD Code     0
  Invalid PAD Tags     0
  Invalid PAD Tag length 0
  Invalid PAD Type     0
  Invalid PADI Session 0
  Invalid PADR Session 0
  Invalid PAD packet length 0
  Invalid PAD packets  0
Total Invalid PAD packets 0

Insufficient Resources 0

```

Lockout Configuration (seconds): Min 10, Max 120  
 Total clients in active lockouts: 0  
 Total clients in lockout grace period: 0

■ Example 3—Uses the PPPoE MTU tag

```
host1#show pppoe interface full
PPPoE interface FastEthernet 2/0 is operStatusUp
  PPPoE interface FastEthernet 2/0 has max sessions = 8000
  PPPoE interface FastEthernet 2/0 will use tag value for mtu
  PPPoE interface FastEthernet 2/0 has no acName set
  PPPoE interface FastEthernet 2/0 autoconfigured subinterfaces
  PPPoE interface FastEthernet 2/0 has 1 active connections,
    out of 1 configured subinterfaces
Assigned profile (any)      : pppoetest
PPPoE Statistics
  Counters:
    PADI received          44
    PADI transmitted       0
    PADO received          0
    PADO transmitted      10
    PADR received          10
    PADR transmitted       0
    PADS received          0
    PADS transmitted      10
    PADT received          0
    PADT transmitted       9
    PADM received          0
    PADM transmitted       0
    PADN received          0
    PADN transmitted       0
  PAD packets received      54
  PAD packets transmitted   29

  Invalid PAD Packets:
    Invalid Version         0
    Invalid PAD Code        0
    Invalid PAD Tags        0
    Invalid PAD Tag length  0
    Invalid PAD Type        0
    Invalid PADI Session    0
    Invalid PADR Session    0
    Invalid PAD packet length 0
    Invalid PAD packets     0
    Total Invalid PAD packets 0

  Insufficient Resources 0

Lockout Configuration (seconds): Min 5, Max 60
Total clients in active lockouts: 0
Total clients in lockout grace period: 0
```

**show pppoe interface summary**

- Use to display the operational and administrative status of all configured PPPoE interfaces.
- Field descriptions
  - Total PPPoE interfaces—Number of configured PPPoE interfaces included in summary
  - Administrative Status
    - Up—Number of interfaces not affected by manual administrative intervention
    - Down—Number of interfaces that cannot flow because of manual administrative intervention
  - Operational Status
    - Up—Number of interfaces that are operational
    - Down—Number of interfaces that are not operational
    - LowerLayerDown—Number of interfaces that are not operational because an underlying interface is down
    - NotPresent—Number of interfaces that are not operational because hardware is unavailable

## ■ Example

```
host1:01#show pppoe interface summary
Total PPPoE interfaces: 16
```

```
Administrative Status:
```

```
    Up: 15
    Down: 1
```

```
Operational Status:
```

```
    Up: 15
    Down: 1
    LowerLayerDown: 1
    NotPresent: 0
```

**show pppoe-service-name-table**

- Use to display the contents of a PPPoE service name table configured on the router.
- The command displays the table name, action (terminate or drop) associated with the empty service name tag, and the name of each specific service name entry in the table.
- You must specify the name of the PPPoE service name table configured with the **pppoe-service-name-table** command from Global Configuration mode.
- To display the names of PPPoE service name tables that you can specify to complete the command, issue the **show pppoe-service-name-table name ?** command.

- Field descriptions
  - Service Name Table—Name of the PPPoE service name table configured with the **pppoe-service-name-table** command
  - Empty service name action—Action (terminate or drop) associated with the empty service name tag in the PPPoE service name table
  - Service name—Name of the specific (custom) service name tag configured with the **service** command
- Example 1—Displays the names of PPPoE service name tables that you can specify to complete the command

```
host1#show pppoe-service-name-table name ?
myDefaultTable myDefaultTable service-name-table
myServiceTable1 myServiceTable1 service-name-table
myServiceTable2 myServiceTable2 service-name-table
myServiceTable3 myServiceTable3 service-name-table
```

- Example 2—Displays the contents of a default PPPoE service name table with no specific service name entries

```
host1#show pppoe-service-name-table name myDefaultTable
Service Name Table myDefaultTable
Empty service name action: terminate
```

- Example 3—Displays the contents of a PPPoE service name table that has three specific service name entries and the nondefault action (drop) associated with the empty service name tag

```
host1#show pppoe-service-name-table name myServiceTable1
Service Name Table myServiceTable1
Empty service name action: drop
Service name: myISPService
Service name: myQOSClass1
Service name: myQOSClass2
```

- Example 4—Displays the names of all PPPoE service name tables configured on the router

```
host1#show pppoe-service-name-table brief
Service-Name Table:
myServiceTable1
myServiceTable2
```

### **show pppoe subinterface**

- Use to display parameters for PPPoE subinterfaces.
- If you do not specify a subinterface, the router displays the configured PPPoE subinterface number and status for all configured PPPoE subinterfaces.
- If you specify an interface with no subinterface, the router displays the status for the subinterfaces associated with the interface.
- If you specify an interface and subinterface, the router displays detailed parameters available for that subinterface.
- To display configuration, status, and statistics information, use the **full** keyword.

- Field descriptions
  - PPPoE subinterface—Interface specifier
  - Status—Operational status of the interface. Possible values are:
    - operStatusUp—Interface or subinterface is operational
    - Down—Interface or subinterface is not operational
    - LowerLayerDown—Subinterface is not operational because an underlying interface or subinterface is down
  - URL String—URL string sent in the PADM message to PPPoE clients
  - MOTM String—Message of the minute string sent in the PADM message to PPPoE clients
  - session id—Session ID of the subinterface
  - source MAC address—MAC address of PPPoE client
  - MTU—Maximum transfer unit (MTU) value; when derived from the PPPoE MTU tag, the value can only be determined from an active session.
  - In Octets—Number of octets received on the subinterface
  - Out Octets—Number of octets transmitted on the subinterface
  - In Packets—Number of packets received on the subinterface
  - Out Packets—Number of packets transmitted on the subinterface

- Example 1

```

host1:v0#show pppoe subinterface fastEthernet 1/1.1.1
PPPoE subinterface fastEthernet 1/1.1.1 is operStatusUp
    URL String: http://www.urlofinterest.com
    MOTM String: a horse walks into a bar
PPPoE subinterface fastEthernet 1/1.1.1 has a session id of 1
PPPoE Statistics
    In Octets: 480
    Out Octets: 256
    In Packets: 8
    Out Packets: 8
  
```

- Example 2

```

host1:v0#show pppoe subinterface full
PPPoE subinterface FastEthernet 2/0.11 is operStatusUp (dynamic)
    PPPoE subinterface FastEthernet 2/0.11 has a session id of 8
    PPPoE subinterface FastEthernet 2/0.11 has source MAC address 0090.1a40.280a
    PPPoE subinterface FastEthernet 2/0.11 has a MTU of 1494
PPPoE Statistics
    In Octets: 165922
    Out Octets: 108283
    In Packets: 3607
    Out Packets: 3608
  
```

**show pppoe subinterface summary**

- Use to display the operational and administrative status of all configured PPPoE subinterfaces.
- Field descriptions
  - Total PPPoE subinterfaces—Number of configured PPPoE subinterfaces included in summary
  - Administrative Status
    - Up—Number of subinterfaces not affected by manual administrative intervention
    - Down—Number of subinterfaces that cannot flow because of manual administrative intervention
  - Operational Status
    - Up—Number of subinterfaces that are operational
    - Down—Number of subinterfaces that are not operational
    - LowerLayerDown—Number of subinterfaces that are not operational because an underlying interface is down
    - NotPresent—Number of subinterfaces that are not operational because hardware is unavailable
- Example

```
host1:01#show pppoe subinterface summary
Total PPPoE subinterfaces: 116
```

```
Administrative Status:
    Up: 115
    Down: 1
```

```
Operational Status:
    Up: 115
    Down: 1
    LowerLayerDown: 1
    NotPresent: 0
```

**show profile**

- Use to display information about profiles.
- To display information about a specific profile, use the **name** keyword.
- To display a list of profiles configured on the router, use the **brief** keyword.
- Field descriptions
  - Profile—Name of the profile that is displayed
  - IP address—IP address and subnet mask of the interface, or none if the interface is unnumbered
  - Unnumbered interface—Specifier for the unnumbered interface, or none if the interface is numbered
  - Router—Name of the virtual router (VR) assigned to the profile; interfaces created by the profile are attached to this VR
  - Directed Broadcast—Enabled or disabled

- ICMP Redirects—Enabled or disabled
- Access Route Addition—Enabled or disabled
- Network Address Translation—Enabled or disabled; domain location (inside or outside)
- Source-Address Validation—Enabled or disabled
- Ignore DF Bit—Enabled or disabled
- Filter Option Packets—Router filters out packets with IP options; enabled or disabled
- Administrative MTU—MTU size configured on the profile
- TCP MSS value—Maximum segment size for TCP SYN packets traveling through the interface
- Inactivity Timer—Inactivity timer setting; enabled or disabled
- Route Map Name—Route map applied to the IP interface subscriber; enabled or disabled
- Auto Detect—Router automatically detects packets that do not match any entries in the demultiplexer table; enabled or disabled
- Auto Configure—Dynamic creation of subscriber interfaces on a primary IP interface; enabled or disabled
- IGMP—Enabled or disabled
- static-groups—Displays address of any static groups configured for IGMP
- Input policy—Name of input policy and whether statistics are enabled or disabled
- Output policy—Name of output policy and whether statistics are enabled or disabled
- PPP Keepalive—PPP keepalive period, in seconds
- PPP Magic Number—Enabled or disabled
- PPP Peer DNS Priority—Enabled or disabled
- PPP Peer WINS Priority—Enabled or disabled
- PPP Authentication—Type of authentication configured: PAP, CHAP, or none
- PPP Authentication Router—Name of authentication virtual router
- PPP Negotiate MRU—MRU configured for the profile
- PPP Packet Log—Enabled or disabled
- PPP State Log—Enabled or disabled
- PPP Chap Challenge Length—Minimum and maximum Chap Challenge length
- PPP Passive Mode—Enabled or disabled
- PPP Multilink—Enabled or disabled
- PPP IPCP netmask option—Enabled or disabled
- PPP AAA Profile—AAA profile associated with this PPP interface



- PPP Multilink Fragmentation—Enabled or disabled
- PPP Multilink Fragment Size—Multilink fragment size for this PPP interface
- PPP Multilink Reassembly—Enabled or disabled
- PPP Multilink Mrru—Multilink MRRU value for this PPP interface
- PPP Initiate IP—Initiation of IPv4 over this PPP interface; enabled or disabled
- PPP Initiate IPv6—Initiation of IPv6 over this PPP interface; enabled or disabled
- PPPoE Max Sessions—Maximum number of PPPoE subinterfaces that can be on an interface
- PPPoE Always-offer—Router offers to set up a session for the client, even if the router has insufficient resources to establish a session; enabled or disabled
- PPPoE Remote-Circuit-Id—The router captures and processes a vendor-specific tag containing a remote circuit ID transmitted from a digital subscriber line access multiplexer (DSLAM); enabled or disabled
- PPPoE Log PPpoeControlPacket—Enabled or disabled
- PPPOE duplicate-protect—Enabled or disabled
- PPPoE ACNAME—Access concentrator name
- PPPoE URL—URL sent in PADM message to PPPoE clients
- PPPoE MOTM—Message of the minute sent in the PADM message to PPPoE clients
- PPPoE Service-Name Table—Name of the PPPoE service name table, if configured for the specified profile
- Example—Displays configuration information for a PPPoE profile assigned to a dynamic interface

```

host1#show profile name pppoeProfile
Profile                               : pppoeProfile
Unnumbered interface on              : loopback 1
Router                               : default
Directed Broadcast                   : Disabled
ICMP Redirects                       : Disabled
Access Route Addition                : Enabled
Network Address Translation          : Disabled
Source-Address Validation             : Disabled
Ignore DF Bit                        : Disabled
Filter Option Packets                 : Disabled
Administrative MTU                    : 1500
TCP MSS value                        : 0
Inactivity Timer                     : Disabled
Route Map Name                       : Disabled
Auto Detect                          : Disabled
Auto Configure                       : Disabled

IGMP                                 : Enabled
static-groups                        :
Input policy: bobb statistics enabled
Output policy: bobb statistics enabled

```

```

PPP Keepalive           : 30
PPP Magic Number        : enabled
PPP Peer DNS Priority    : disabled
PPP Peer WINS Priority   : disabled
PPP Authentication      : pap/chap
PPP Authentication Router :
PPP Negotiate MRU       : (use lower layer MRU)
PPP Packet Log          : disabled
PPP State Log           : disabled
PPP Chap Challenge Length : 16 - 32
PPP Passive Mode        : disabled
PPP Multilink           : disabled
PPP IPCP Netmask Option : disabled
PPP AAA Profile         :
PPP Multilink Fragmentation : disabled
PPP Multilink Fragment Size : (use MTU)
PPP Multilink Reassembly : disabled
PPP Multilink Mrru      : (use MRU)
PPP Initiate IP         : disabled
PPP Initiate IPv6       : disabled
PPPoE Max Sessions     : 2
PPPoE Always-offer      : Disabled
PPPoE Remote-Circuit-Id : Enabled
PPPoE Log PPPoEControlPacket: Disabled
PPPoE duplicate-protect : Enabled
PPPoE ACNAME            : CYM9876
PPPoE URL               : http://www.urllofinterest.com
PPPoE MOTM              : goodmorning
PPPoE Service-Name table : myServiceTable1

```

### **show radius override**

- Use to display the current override settings configured on the RADIUS client (LNS) for the NAS-IP-Address [4], NAS-Port-Id [87], Calling-Station-Id [31], and NAS-Identifier [32] RADIUS attributes.
- Field descriptions
  - nas-ip-addr—Override setting for the NAS-IP-Address attribute
  - nas-port-id—Override setting for the NAS-Port-Id attribute; value is remote-circuit-id if configured with **radius override nas-port-id remote-circuit-id** command
  - calling-station-id—Override setting for the Calling-Station-Id attribute; value is remote-circuit-id if configured with **radius override calling-station-id remote-circuit-id** command
  - nas-info—Virtual router that generates the NAS-IP-Address and NAS-Identifier attributes for AAA broadcast accounting packets; current virtual router or authentication virtual router
- Example
 

```

host1#show radius override
nas-ip-addr:      nas-ip-addr
nas-port-id:      remote-circuit-id
calling-station-id: remote-circuit-id
nas-info:         from current virtual router

```

**show radius remote-circuit-id-delimiter**

- Use to display the delimiter character configured to set off components in the PPPoE remote circuit ID value captured from a DSLAM.
- The default delimiter character is #.
- Example

```
host1#show radius remote-circuit-id-delimiter
%
```

**show radius remote-circuit-id-format**

- Use to display the format configured for the PPPoE remote circuit ID value captured from a DSLAM.
- If the PPPoE remote circuit ID value is configured to include any or all of the agent-circuit-id, agent-remote-id, and nas-identifier components, the display lists the components included and the order in which they appear.
- If the PPPoE remote circuit ID value is configured to use the format for the **dsl-forum-1** keyword of the **radius remote-circuit-id-format** command, the display indicates that this format is in effect.
- The default format is agent-circuit-ID.
- Example

```
host1#show radius remote-circuit-id-format
nas-identifier agent-circuit-id agent-remote-id
```

## Troubleshooting

---

Use the **pppoeControlPacket** log to diagnose problems on your PPPoE interfaces.

**log severity debug pppoeControlPacket**

- Use to configure a packet trace log for a PPPoE interface. You must specify a PPPoE major interface.
- Specify one of the following interface types and a corresponding interface specifier. For more information, see *Interface Types and Specifiers* in *JUNOS Command Reference Guide, About This Guide*.
  - **fastEthernet**
  - **gigabitEthernet**
  - **atm**
  - **tenGigabitEthernet**
- The packet trace log for a PPPoE interface displays only the first 256 bytes of packet data. Data in excess of 256 bytes does not appear in the packet trace log.
- You also configure logging to direct the output to a specific destination. For information, see *JUNOS System Event Logging Reference Guide, Chapter 1, System Logging Overview*.

### ■ Example

```

host1(config-if)#ip address 164.10.6.71 255.255.255.0
host1(config-if)#log severity debug pppoeControlPacket atm 10/0.1
host1:v0#DEBUG 07/25/2000 15:13:19 pppoeControlPacket (interface atm 10/0.1): PADI rx from
00-09-01-a0-00-2e
DEBUG 07/25/2000 15:13:19 pppoeControlPacket (interface atm 10/0.1): PAD0 tx to 00-09-01-a0-00-2e
DEBUG 07/25/2000 15:13:19 pppoeControlPacket (interface atm 10/0.1): PADR rx from 00-09-01-a0-00-2e
DEBUG 07/25/2000 15:13:19 pppoeControlPacket (interface atm 10/0.1): PADS tx to 00-09-01-a0-00-2e,
connection made using session id 3 on sub interface 1

RX-a0-00-2e:v0#
RX-a0-00-2e:v0#
RX-a0-00-2e:v0#
RX-a0-00-2e:v0#
RX-a0-00-2e:v0#
RX-a0-00-2e:v0#
RX-a0-00-2e:v0#config t
Enter configuration commands, one per line. End with CNTL/Z.
RX-a0-00-2e:v0(config)#interface atm 10/1.1.1
RX-a0-00-2e:v0(config-if)#ppp shut
RX-a0-00-2e:v0(config-if)#DEBUG 07/25/2000 15:13:38 pppoeControlPacket (interface atm 10/0.1): PADT rx
from 00-09-01-a0-00-2e
RX-a0-00-2e:v0(config-if)#
RX-a0-00-2e:v0(config-if)#no ppp shut
RX-a0-00-2e:v0(config-if)#pppoe test
RX-a0-00-2e:v0(config-if)#DEBUG 07/25/2000 15:13:49 pppoeControlPacket (interface atm 10/0.1): PADI rx
from 00-09-01-a0-00-2e
DEBUG 07/25/2000 15:13:49 pppoeControlPacket (interface atm 10/0.1): PAD0 tx to 00-09-01-a0-00-2e
DEBUG 07/25/2000 15:13:49 pppoeControlPacket (interface atm 10/0.1): PADR rx from 00-09-01-a0-00-2e
DEBUG 07/25/2000 15:13:49 pppoeControlPacket (interface atm 10/0.1): PADS tx to 00-09-01-a0-00-2e,
connection made using session id 4 on sub interface 1

RX-a0-00-2e:v0(config-if)#
RX-a0-00-2e:v0(config-if)#exit

```