



Configuring the PPPoE Intermediate Agent

This chapter describes PPPoE Intermediate Agent on Cisco ME 3400E series switches. It includes the following sections:

- [Understanding PPPoE Intermediate Agent, page 10-1](#)
- [Configuring PPPoE IA, page 10-2](#)
- [Displaying Configuration Parameters, page 10-12](#)
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- [Debugging PPPoE Intermediate Agent, page 10-14](#)
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Note

For complete syntax and usage information for the switch commands used in this chapter, refer to the *Cisco ME 3400E Ethernet Access Switch Command Reference, Cisco IOS Release 12.2(60)EZ* at: http://www.cisco.com/en/US/partner/products/ps9637/prod_command_reference_list.html

Understanding PPPoE Intermediate Agent

PPPoE Intermediate Agent (PPPoE IA) is placed between a subscriber and BRAS to help the service provider BRAS distinguish between end hosts connected over Ethernet to an access switch.

On the access switch, PPPoE IA enables Subscriber Line Identification by appropriately tagging Ethernet frames of different users. The tag contains specific information such as which subscriber is connected to the switch and VLAN.

PPPoE IA acts as mini security firewall between host and BRAS by intercepting all PPPoE Active Discovery (PAD) messages on a per-port per-VLAN basis. It provides specific security feature such as verifying the intercepted PAD message from untrusted port, performing per-port PAD message rate limiting, inserting and removing VSA Tags into and from PAD messages, respectively.

PPPoE IA is supported on the following switchport modes:

- Access
- Trunk
- Dot1q-tunnel
- EtherChannel

Restrictions

- PPPoE IA is not supported on routed interfaces.
- Interface and Interface-VLAN based PPPoE IA configurations take effect only when the PPPoE IA feature is enabled globally. Discovery packets are dropped if PPPoE IA is disabled globally.
- For EtherChannel, you must configure PPPoE IA on the port-channel interface. If a member port is removed from the EtherChannel, PPPoE IA configuration is not removed from the member port.
- We support up to 6000 PPPoE sessions through the ME 3400E device acting as an intermediate agent.
- Do not configure host-connected ports as PPPoE IA trusted. Only configure BRAS connecting switchports as trusted interfaces.
- PPPoE IA feature on ME 3400E platform supports global/per-port/per-VLAN based format configuration for generating the circuit-id and remote-id. Choose the correct option to meet the requirements.
- If you need to configure a large number of intermediate agent devices for PPPoE snooping, use the global command for automatically generating subscriber-line information in the VSA tag by the feature.

Guidelines for PPPoE IA with EtherChannel

Use the following guidelines when configuring PPPoE IA on EtherChannel:

- PPPoE IA configuration is permitted only on a port-channel interface. An error message is displayed if you attempt to apply or unconfigure PPPoE IA to or from member ports.
- Once configured on a port-channel interface, configuration is uniquely applied to all member ports of the channel.
- If a new member port having PPPoE IA configuration is added to EtherChannel, PPPoE IA configuration of the port-channel interface overwrites it with its own configuration.

Configuring PPPoE IA

To configure PPPoE IA, use the following procedures:

- [Configuring PPPoE IA on the Switch, page 10-2](#)
- [Configuring PPPoE IA on an Interface, page 10-6](#)
- [Configuring PPPoE IA on a VLAN, page 10-10](#)

Configuring PPPoE IA on the Switch

The following sections describe how to configure PPPoE IA at the switch level using global configuration commands:

- [Enabling PPPoE IA on a Switch, page 10-3](#)
- [Configuring the Access Node Identifier for PPPoE IA, page 10-3](#)

- [Configuring the Circuit-ID With Host Name and Port Name in Global Configuration Mode, page 10-4](#)
- [Configuring the Identifier String, Option, and Delimiter for PPPoE IA, page 10-4](#)
- [Configuring the Generic Error Message for PPPoE IA, page 10-5](#)

Enabling PPPoE IA on a Switch

Beginning in privileged EXEC mode, follow these steps to enable or disable PPPoE IA globally on the switch:



Note By default, PPPoE IA is disabled globally.

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	pppoe intermediate-agent	Enable PPPoE IA on the switch.
	no pppoe intermediate-agent	Use the no version of the command to disable the PPPoE IA feature on the switch.

This example shows how to enable PPPoE IA:

```
Switch> enable
Switch# configure terminal
Switch(config)# pppoe intermediate-agent
```

Configuring the Access Node Identifier for PPPoE IA

If you do not specify the access node identifier of the switch, the value is automatically set as the IP address of the management interface.

Beginning in privileged EXEC mode, follow these steps to set the access node identifier string of the switch.

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	pppoe intermediate-agent format-type access-node-identifier string <i>string_value</i>	Specify the ASCII string value for the access node identifier.
	no pppoe intermediate-agent format-type access-node-identifier	Use the no form of the command to unconfigure the access-node identifier string and set it to the default.

The following example shows how to set an access node identifier of switch123.

```
Switch> enable
Switch# configure terminal
Switch(config)# pppoe intermediate-agent format-type access-node-id string switch123
```

Configuring the Circuit-ID With Host Name and Port Name in Global Configuration Mode

By default, the circuit ID is automatically generated by the switch.

Beginning in privileged EXEC mode, follow these steps to manually set the circuit ID in global configuration mode.

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	pppoe intermediate-agent format-type circuit-id hostname portname no pppoe intermediate-agent format-type circuit-id	Configure the Circuit ID with hostname and port name. Use the no form of the command to unconfigure the access-node identifier string and set it to the default.
Step 3	pppoe intermediate-agent format-type circuit-id string circuit-id-name no pppoe intermediate-agent format-type string	Set the access node identifier and ASCII identifier string for the switch.

The following example shows how to set the circuit ID in global configuration mode.

```
Switch> enable
Switch# configure terminal
Switch(config)# pppoe intermediate-agent format-type circuit-id string GLB_cir
Switch(config)# pppoe intermediate-agent format-type remote-id string GLB_rmt
Switch(config)# pppoe intermediate-agent
```



Note

A specific VLAN of the interface takes the highest priority, followed by the interface, and then the globally-enabled circuit ID and remote ID.

Configuring the Identifier String, Option, and Delimiter for PPPoE IA

By default, the circuit ID is automatically generated by the switch.

Beginning in privileged EXEC mode, follow these steps to manually set the circuit ID:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	pppoe intermediate-agent format-type identifier-string string <i>string_value</i> option <i>splsvlpvls</i> delimiter type	Specify the ASCII string value for the circuit ID. Specify an option value: <ul style="list-style-type: none"> • <i>sp</i>—slot + port • <i>sv</i>—slot + VLAN • <i>pv</i>—port + VLAN • <i>spv</i>—slot + port + VLAN Specify the delimiter between slot/port/VLAN. Values for delimiter include: #, ,!,/space. This command does not affect the circuit ID configured explicitly per-interface or per-interface per-VLAN with the pppoe intermediate-agent format-type circuit-id or pppoe intermediate-agent vlan num format-type circuit-id commands.

The following example shows how to set an identifier string of circuit1 with slot:port:VLAN delimited by “:”:

```
Switch> enable
Switch# configure terminal
Switch(config) pppoe intermediate-agent format-type
                identifier-string string circuit1
                option spv delimiter :
```

Configuring the Generic Error Message for PPPoE IA

PPPoE IA sends a generic error message only on a specific error condition. If you do not specify **string** {*WORD*}, the error message is not added.

Beginning in privileged EXEC mode, follow these steps to specify a generic error message:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	pppoe intermediate-agent format-type generic-error-message string <i>message</i>	Specify the ASCII string value for the generic error message.

The following example shows how to configure a generic message of packet_length>1484:

```
Switch> enable
Switch# configure terminal
Switch(config) pppoe intermediate-agent format-type
                generic-error-message string packet_length>1484
```

By default the generic-error-message is not set. The **string** value is converted to UTF-8 before it is added to the response. A message similar to the following displays:

```
PPPoE Discover packet too large to process. Try reducing the number of tags added.
```

**Note**

This TAG (0x0203 Generic-Error) indicates an error. It can be added to PPPoE Active Discovery Offer (PADO) or PPPoE active discovery session-confirmation (PADS) packets generated by PPPoE IA and then sent back to user in reply of PPPoE Active Discovery Initiation (PADI) or PPPoE active discovery request (PADR), when a PPPoE discovery packet received by PPPoE IA with PPPoE payload greater than 1484 bytes. Error data must be a UTF-8 string.

Configuring PPPoE IA on an Interface

The following sections describe how to configure PPPoE IA at the interface level using interface configuration commands:

- [Enabling PPPoE IA on an Interface, page 10-6](#)
- [Configuring the PPPoE IA Trust Setting on an Interface, page 10-7](#)
- [Configuring PPPoE IA Rate Limiting Setting on an Interface, page 10-7](#)
- [Configuring PPPoE IA Vendor-tag Stripping on an Interface, page 10-8](#)
- [Configuring PPPoE IA Circuit-ID and Remote-ID on an Interface, page 10-9](#)

Enabling PPPoE IA on an Interface

Use the steps in this section to enable PPPoE IA on an interface.

This setting applies to all frames passing through this interface, regardless of the VLAN to which they belong. By default the PPPoE IA feature is disabled on all interfaces. You need to run this command on every interface that requires this feature.

Prerequisite

You must enable PPPoE IA on the switch in the global configuration mode. See [Enabling PPPoE IA on a Switch, page 10-3](#).

Configuration

Beginning in privileged EXEC mode, follow these steps to enable or disable PPPoE IA on an interface:

	Command	Purpose
Step 1	<code>configure terminal</code>	Enter global configuration mode.
Step 2	<code>interface type number</code>	Enter interface configuration mode. For type , enter the interface type. For number , enter the module and port number.
Step 3	<code>pppoe intermediate-agent</code>	Enable or disable PPPoE IA on the interface.

The following example shows how to enable PPPoE IA on FastEthernet 3/1:

```
Switch> enable
Switch# configure terminal
Switch(config) interface FastEthernet 3/1
Switch(config-if) pppoe intermediate-agent
```

**Note**

Enabling PPPoE IA on an interface does not ensure that incoming packets are tagged. For this to happen PPPoE IA must be enabled globally, and at least one interface that connects the switch to PPPoE server has a trusted PPPoE IA setting.

Configuring the PPPoE IA Trust Setting on an Interface

Interfaces that connect the switch to the PPPoE server are configured as trusted. Interfaces that connect the switch to users (PPPoE clients) are untrusted.

This setting is disabled by default.

Beginning in privileged EXEC mode, follow these steps to set a physical interface as trusted:

	Command	Purpose
Step 1	<code>configure terminal</code>	Enter global configuration mode.
Step 2	<code>interface type number</code>	Enter interface configuration mode. For type , enter the interface type. For number , enter the module and port number.
Step 3	<code>pppoe intermediate-agent trust</code>	Set the interface as trusted.

The following example shows how to set FastEthernet interface 3/1 as trusted:

```
Switch> enable
Switch# configure terminal
Switch(config) interface FastEthernet 3/1
Switch(config-if) pppoe intermediate-agent trust
```

Configuring PPPoE IA Rate Limiting Setting on an Interface

You can limit the rate (packets per second) at which PPPoE discovery packets (PADI, PADO, PADR, PADS, and PADT) are received on an interface. When the incoming packet rate achieves or exceeds the configured limit, a port enters an error-disabled state and shuts down.

**Note**

This limit applies to the physical interface. If a single VLAN goes down on an interface in trunk mode, the entire interface is shut down (error-disabled), bringing down other VLAN traffic on the interface.

If you set the limit on the interface that connect the access switch to BRAS, use a higher value since the BRAS aggregates all the PPPoE traffic to the access switch through this interface.

Beginning in privileged EXEC mode, follow these steps to set a rate limit:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	interface type number	Enter interface configuration mode. For type , enter the interface type. For number , enter the module and port number.
Step 3	pppoe intermediate-agent limit rate packets_per_second	Set the limit rate in packets per second. By default no rate limit is set. To throttle the PPPoE discovery packets, set the explicit limit.

The following example shows how to set a rate limit of 30 at FastEthernet 3/1:

```
Switch> enable
Switch# configure terminal
Switch(config) interface FastEthernet 3/1
Switch(config-if) pppoe intermediate-agent limit rate 30
```

Configuring PPPoE IA Vendor-tag Stripping on an Interface

Vendor-specific tags (VSAs) carry subscriber and line identification information in the packets.

Vendor-tag stripping involves removing the VSAs from PADO, PADS, and PADT packets that are received on an interface before forwarding them to the user.

You configure vendor-tag stripping on interfaces connected to the PPPoE server.

This setting is disabled by default.



Note

BRAS automatically strips the vendor-specific tag off of the PPPoE discovery packets before sending them downstream to the access switch. To operate with older BRAS which does not possess this capability, use the **pppoe intermediate-agent vendor-tag strip** command on the interface connecting the access switch to BRAS.

Prerequisites

- Enable PPPoE on an interface.
- Set the PPPoE interface to trust.

Configuration

Beginning in privileged EXEC mode, follow these steps to enable stripping on an interface:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.

	Command	Purpose
Step 2	interface type number	Enter interface configuration mode. For type , enter the interface type. For number , enter the module and port number.
Step 3	pppoe intermediate-agent vendor-tag strip	Enable vendor tag stripping on the trusted interface.

The following example shows how to enable stripping on FastEthernet 3/1:

```
Switch> enable
Switch# configure terminal
Switch(config) interface FastEthernet 3/2
Switch(config-if) pppoe intermediate-agent vendor-tag strip
```

Configuring PPPoE IA Circuit-ID and Remote-ID on an Interface

You can configure the circuit ID and remote ID on a physical interface. The PADI, PADR, and PADT packets (belonging to PPPoE discovery stage) that are received on this physical interface are tagged with either one of these IDs. These packets are tagged regardless of their VLAN if PPPoE is not enabled for that VLAN.

Set the circuit ID on an interface to override the automatic generation of the circuit ID by the switch.

Set the remote ID instead for subscriber link identification. Configure the remote ID on every interface in which you enabled PPPoE IA. Otherwise, the default value for remote ID is the switch MAC address.

Beginning in privileged EXEC mode, follow these steps to configure the circuit ID and remote ID on an interface:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	interface type number	Enter interface configuration mode. For type , enter the interface type. For number , enter the module and port number.
Step 3	pppoe intermediate-agent circuit-id string <i>circuit_id_name</i>	Configure the circuit ID.
Step 4	pppoe intermediate-agent remote-id string <i>remote_id_name</i>	Configure the remote ID.

The following example shows how to configure the circuit ID as root and the remote ID as granite:

```
Switch> enable
Switch# configure terminal
Switch(config) interface FastEthernet 3/1
Switch(config-if) pppoe intermediate-agent format-type circuit-id string root
Switch(config-if) pppoe intermediate-agent format-type remote-id string granite
```

When configuring the PPPoE intermediate agent circuit ID and remote ID on an interface:

- When "PPPoE intermediate-agent is enabled globally, a TCAM entry is added to snoop the packets with ethertype=8863. When such entry is not present, the switch treats the packet as normal data packets.

- In a daisy-chain model, when connecting client/BRAS server, the PPPoE intermediate agent must be enabled at the interface and global level. In the intermediate links of the daisy chain, enable the intermediate agent connected to it to snoop the packet.
- "PPPoE intermediate agent trust" should be enabled on all switches of the interface that lead to the server. Additionally, if the PPPoE intermediate agent is also enabled, the packets are snooped and the circuit ID is rewritten.

Configuring PPPoE IA on a VLAN

The following sections describe how to configure PPPoE IA at the interface level using interface configuration commands:

- [Enabling PPPoE IA for a Specific VLAN on an Interface, page 10-10](#)
- [Configuring PPPoE IA Circuit-ID and Remote-ID for a VLAN on an Interface, page 10-11](#)

Enabling PPPoE IA for a Specific VLAN on an Interface

You can enable PPPoE IA on either a specific VLAN, a comma-separated list such as “x,y,” or a range such as “x-y.”

Enabling PPPoE IA on VLANs is not dependent upon enabling PPPoE IA on the interfaces.

Prerequisites

- Enable PPPoE IA globally on the switch.
- Ensure at least one interface is connected to the PPPoE server.

Configuration

Beginning in privileged EXEC mode, follow these steps to enable PPPoE IA on one VLAN or a group of VLANs:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	interface type number	Enter interface configuration mode. For type , enter the interface type. For number , enter the module and port number.
Step 3	vlan-range <i>specific_vlan_value</i> vlan-range <i>vlan_list</i> vlan-range <i>vlan_range</i>	Enter VLAN configuration mode. For a specific VLAN, enter the ID. For a list of VLAN, enter the IDs separated by commas. For a range of VLANs, enter the IDs separated by a hyphen.
Step 4	pppoe intermediate-agent	Enable PPPoE IA.

The following examples show how to enable PPPoE on VLANs:

Specific VLAN:

```
Switch# configure terminal
Switch(config)# interface FastEthernet 3/2
Switch(config-if)# vlan-range 5
Switch(config-if-vlan-range)# pppoe intermediate-agent
```

Comma-separated VLAN List:

```
Switch# configure terminal
Switch(config)# interface FastEthernet 3/2
Switch(config-if)# vlan-range 5,6
Switch(config-if-vlan-range)# pppoe intermediate-agent
```

VLAN Range:

```
Switch# configure terminal
Switch(config)# interface FastEthernet 3/2
Switch(config-if)# vlan-range 5-9
Switch(config-if-vlan-range)# pppoe intermediate-agent
```

Configuring PPPoE IA Circuit-ID and Remote-ID for a VLAN on an Interface

You can set the circuit ID and remote ID for a specific VLAN on an interface. The command overrides the circuit ID and remote ID specified for this physical interface. The switch uses the *WORD* value to tag packets received on this VLAN. This parameter is not set by default.

Set the circuit ID on a VLAN to override the automatic generation of the circuit ID by the switch.

The default value of **remote-id** is the switch MAC address (for all VLANs). Set this parameter to encode subscriber-specific information.

Prerequisites

- Enable PPPoE IA globally on the switch.
- Enable PPPoE IA in vlan-range mode.

Configuration

Beginning in privileged EXEC mode, follow these steps to set the circuit ID and remote ID on one VLAN or a group of VLANs:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	interface type number	Enter interface configuration mode. For type , enter the interface type. For number , enter the module and port number.
Step 3	vlan-range specific_vlan_value vlan-range vlan_list vlan-range vlan_range	Enter VLAN configuration mode. For a specific VLAN, enter the ID. For a list of VLAN, enter the IDs separated by commas. For a range of VLANs, enter the IDs separated by a hyphen.

	Command	Purpose
Step 4	pppoe intermediate-agent	Enable PPPoE IA.
Step 5	pppoe intermediate-agent format-type circuit-id string <circuit_id_name>	Configure the circuit ID.
Step 6	pppoe intermediate-agent format-type circuit-id string <remote_id_name>	Configure the remote ID.

This example shows how to set the circuit-id to aaa and the remote-id as ccc on interface FastEthernet 3/2:

```
Switch# configure terminal
Switch(config)# interface FastEthernet 3/2
Switch(config-if)# vlan-range 5
Switch(config-if)# pppoe intermediate-agent
Switch(config-if-vlan-range)# pppoe intermediate-agent format-type circuit-id string aaa
Switch(config-if-vlan-range)# pppoe intermediate-agent format-type remote-id string ccc
```

Displaying Configuration Parameters

Use the **show pppoe intermediate-agent [info|statistics] [interface {interface}]** command to display the various configuration parameters, statistics, and counters stored for PPPoE. This section contains examples of this command and sample data.

Although PPPoE IA is supported on private VLANs, no association (primary and secondary VLAN mapping) information is displayed.

PPPoE IA Information for All Interfaces

Use the following command to show the interfaces and VLANs on which PPPoE is configured:

```
Switch# show pppoe intermediate-agent information
Switch PPPOE Intermediate-Agent is enabled

PPPOE Intermediate-Agent trust/rate is configured on the following Interfaces:

Interface                IA          Trusted    Vsa Strip    Rate limit (pps)
-----
GigabitEthernet3/4      no         yes        yes          unlimited
PPPOE Intermediate-Agent is configured on following VLANs:
2-3
GigabitEthernet3/7      no         no         no           unlimited
PPPOE Intermediate-Agent is configured on following VLANs:
2-3
```

PPPoE Information for an Interface

Use the following command to show PPPoE information for a specified interface:

```
Switch# show pppoe intermediate-agent information interface g3/7
Interface                IA          Trusted    Vsa Strip    Rate limit (pps)
-----
GigabitEthernet3/7      yes         no         no           unlimited
PPPoE Intermediate-Agent is configured on following VLANs:
2-3
```

Statistics

Use the following command to show the number of PADI/PADR/PADT packets received, and the time the last packet was received on all interfaces and on all VLANs pertaining to those interfaces.

```
Switch# show pppoe intermediate-agent statistics

PPPOE IA Per-Port Statistics
-----

Interface : GigabitEthernet3/7
Packets received
  All = 0
  PADI = 0 PADO = 0
  PADR = 0 PADS = 0
  PADT = 0
Packets dropped:
  Rate-limit exceeded = 0
  Server responses from untrusted ports = 0
  Client requests towards untrusted ports = 0
  Malformed PPPoE Discovery packets = 0
Vlan 2: Packets received PADI = 0 PADO = 0 PADR = 0 PADS = 0 PADT = 0
Vlan 3: Packets received PADI = 0 PADO = 0 PADR = 0 PADS = 0 PADT = 0
```

Use the following command to show statistics for a specified interface:

```
Switch# show pppoe intermediate-agent statistics interface g3/7
Interface : GigabitEthernet3/7
Packets received
  All = 3
  PADI = 0 PADO = 0
  PADR = 0 PADS = 0
  PADT = 3
Packets dropped:
  Rate-limit exceeded = 0
  Server responses from untrusted ports = 0
  Client requests towards untrusted ports = 0
  Malformed PPPoE Discovery packets = 0
Vlan 2: Packets received PADI = 6 PADO = 0 PADR = 6 PADS = 0 PADT = 6
Vlan 3: Packets received PADI = 4 PADO = 0 PADR = 4 PADS = 0 PADT = 4
```

Clearing Packet Counters

Use the following command to clear packet counters on all interfaces (per-port and per-port-per-VLAN):

```
Switch# clear pppoe intermediate-agent statistics
```

Issuing of the above command clears the counters for all PPPoE discovery packets (PADI, PADO, PADR, PADS, PADT) received on DUT.

```
Switch# show pppoe intermediate-agent statistics interface g3/7
Interface : GigabitEthernet3/7
Packets received
  All = 0
  PADI = 0 PADO = 0
  PADR = 0 PADS = 0
  PADT = 0
Packets dropped:
  Rate-limit exceeded = 0
```

```

Server responses from untrusted ports = 0
Client requests towards untrusted ports = 0
Malformed PPPoE Discovery packets = 0
Vlan 2: Packets received PADI = 0 PADO = 0 PADR = 0 PADS = 0 PADT = 0
Vlan 3: Packets received PADI = 0 PADO = 0 PADR = 0 PADS = 0 PADT = 0

```

Debugging PPPoE Intermediate Agent

Use the `debug pppoe intermediate-agent [packet | event | all]` command to display useful PPPoE information that assists in debugging. This section contains examples of this command and sample data.

The `all` option enables both package and event options.

Packet Information

Use the following command to display the contents of a packet received in the software: source and destination MAC address of Ethernet frame, code, version and type of PPPoE Discovery packet and a list of TAGs present:

```

Switch# debug pppoe intermediate-agent packet
PPPOE IA Packet debugging is on

*Sep  2 06:12:56.133: PPPOE_IA: Process new PPPoE packet, Message type: PADI, input
interface: Gi3/7, vlan : 2 MAC da: ffff.ffff.ffff, MAC sa: aabb.cc00.0000
*Sep  2 06:12:56.137: PPPOE_IA: received new PPPOE packet from inputinterface
(GigabitEthernet3/4)
*Sep  2 06:12:56.137: PPPOE_IA: received new PPPOE packet from inputinterface
(GigabitEthernet3/8)
*Sep  2 06:12:56.137: PPPOE_IA: Process new PPPoE packet, Message type: PADO, input
interface: Gi3/4, vlan : 2 MAC da: aabb.cc00.0000, MAC sa: 001d.e64c.6512
*Sep  2 06:12:56.137: PPPOE_IA: Process new PPPoE packet, Message type: PADO, input
interface: Gi3/8, vlan : 2 MAC da: aabb.cc00.0000, MAC sa: aabb.cc80.0000
*Sep  2 06:12:56.137: PPPOE_IA: received new PPPOE packet from inputinterface
(GigabitEthernet3/7)
*Sep  2 06:12:56.137: PPPOE_IA: Process new PPPoE packet, Message type: PADR, input
interface: Gi3/7, vlan : 2 MAC da: 001d.e64c.6512, MAC sa: aabb.cc00.0000
*Sep  2 06:12:56.145: PPPOE_IA: received new PPPOE packet from inputinterface
(GigabitEthernet3/4)
*Sep  2 06:12:56.145: PPPOE_IA: Process new PPPoE packet, Message type: PADS, input
interface: Gi3/4, vlan : 2 MAC da: aabb.cc00.0000, MAC sa: 001d.e64c.6512

```

Events

Use the following command to receive messages about PPPoE events:

```

Switch# debug pppoe intermediate-agent event
PPPOE IA Event debugging is on

*Jul 30 19:00:10.254: %PPPOE_IA-4-PPPOE_IA_ERRDISABLE_WARNING: PPPOE IA received 5 PPPOE
packets on interface Gi3/7
*Jul 30 19:00:10.254: %PPPOE_IA-4-PPPOE_IA_RATE_LIMIT_EXCEEDED: The interface Gi3/7 is
receiving more than the threshold set
*Jul 30 19:00:10.394: %PM-4-ERR_DISABLE: STANDBY:pppoe-ia-rate-limit error detected on
Gi3/7, putting Gi3/7 in err-disable stat

```

Troubleshooting Tips

Use the **debug radius** privileged EXEC command to generate a report that includes information about the incoming access interface, where discovery frames are received, and about the session being established in PPPoE extended NAS-Port format (format d).

