



# PPPoE Smart Server Selection

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The PPPoE Smart Server Selection feature allows service providers to determine which Broadband Remote Access Server (BRAS) a PPP call will terminate on.

The PPPoE Smart Server Selection feature allows you to configure a specific PPP over Ethernet (PPPoE) Active Discovery Offer (PADO) delay for a received PPPoE Active Discovery Initiation (PADI) packet. The PADO delay establishes the order in which the BRASs respond to PADIs by delaying their responses to particular PADIs by various times.

## Finding Feature Information

For the latest feature information and caveats, see the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the [“Feature Information for PPPoE Smart Server Selection”](#) section on [page 10](#).

Use Cisco Feature Navigator to find information about platform support and Cisco IOS XE software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

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# Information About PPPoE Smart Server Selection

To enable the PPPoE Smart Server Selection feature, you should understand the following concept:

- [Benefits of PPPoE Smart Server Selection, page 2](#)

## Benefits of PPPoE Smart Server Selection

PPPoE Smart Server Selection provides the following benefits for the Internet service providers (ISPs):

- Optimize their networks by predicting and isolating PPP calls to terminate on a particular BRAS.
- Establish a priority order among the BRASs by configuring varying degrees of delays in the broadband access (BBA) groups on different BRASs.
- Use circuit ID and remote ID tag matching with strings up to 64 characters in length.
- Use spaces in remote ID, circuit ID, and PPPoE service names.
- Restrict the service advertisements from a BRASs in a PADO message.
- Apply a PADO transmission delay based on circuit ID, remote ID, and service name.
- Do partial matching on service name, remote ID, and circuit ID.

## How to Configure PPPoE Smart Server Selection

This section contains the following procedures:

- [Configuring BBA Group PADO Delay \(optional\)](#)
- [Configuring PPPoE Service PADO Delay \(optional\)](#)
- [Configuring PPPoE Service PADO Delay \(optional\)](#)

## Configuring BBA Group PADO Delay

Perform this task to allow all calls coming into a defined BBA group on a BRAS to be treated with the same priority. All incoming sessions for a particular group would have their PADO responses delayed by the configured number of milliseconds.

This task allows ISPs to establish a priority order among the BRASs by configuring varying degrees of delays in the BBA groups on different BRASs.

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **bba-group pppoe {group-name | global}**
4. **pado delay milliseconds**

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**DETAILED STEPS**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	<p><b>enable</b></p> <p><b>Example:</b> Router&gt; enable</p>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>Enter your password if prompted.</li> </ul>
<b>Step 2</b>	<p><b>configure terminal</b></p> <p><b>Example:</b> Router# configure terminal</p>	<p>Enters global configuration mode.</p>
<b>Step 3</b>	<p><b>bba-group pppoe</b> {group-name   global}</p> <p><b>Example:</b> Router(config)# bba-group pppoe server-selection</p>	<p>Defines a PPP over Ethernet (PPPoE) profile, and enters BBA group configuration mode.</p> <ul style="list-style-type: none"> <li>The <b>global</b> keyword creates a profile, which serves as the default profile for any PPPoE port that is not assigned a specific profile.</li> </ul>
<b>Step 4</b>	<p><b>pado delay</b> milliseconds</p> <p><b>Example:</b> Router(config-bba-group)# pado delay 45</p>	<p>Sets the time by which a PADO response is delayed for a BBA group.</p> <p><b>Note</b> Setting a value of 0 means no transmission delay. Setting a value of 9999 means setting an infinite time (PADO is never sent).</p>

**Troubleshooting Tips**

Use the **debug pppoe** command to troubleshoot the PPPoE session.

**Configuring PADO Delay Based on Remote ID or Circuit ID**

This task uses the **pppoe server** command to define a list of circuit ID and remote ID tags on a BRAS for a particular BBA group. The **pppoe delay** command is extended to specify delays based on the PPPoE circuit ID or remote ID tag.

All incoming calls are scanned and if the circuit ID or remote ID tags in the PADI match the list on the BRAS, then the PADO response will be delayed by the configured delay time. If there is no delay defined based on the circuit ID or remote ID, the per-PPPoE service delay is sought. If it is not found, the delay for the BBA group PADO is used. If no PPPoE delay is found, the PADO is sent without delay.

If there is no match and a BBA group PADO delay is configured under the same BBA group, then the PADO response is delayed by the configured delay time for that BBA group. If a BBA group PADO delay is not configured, then the PADO response is sent immediately.

With PPPoE smart server selection, you can do a partial match for a configured string by using a circuit ID or remote ID delay configured for the PPPoE server. (*Partial matching* is searching for parts of strings. It is used to search for similar strings.) The preference for matching the string is described in the [DETAILED STEPS](#) table.

Perform this task to define a list of circuit ID and remote ID tags on a BRAS for a particular BBA group and configures the delay associated with the circuit ID and remote ID tags.

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**SUMMARY STEPS**

1. **enable**
2. **configure terminal**
3. **bba-group pppoe** {*group-name* | **global**}
4. **pppoe server circuit-id delay** *milliseconds* **string** [**contains**] *circuit-id-string*
5. **pppoe server remote-id delay** *milliseconds* **string** [**contains**] *remote-id-string*
6. **pado delay circuit-id** *milliseconds*
7. **pado delay remote-id** *milliseconds*
8. **pado delay** *milliseconds*
9. **end**

**DETAILED STEPS**

	Command or Action	Purpose
Step 1	<b>enable</b>  <b>Example:</b> Router> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>
Step 2	<b>configure terminal</b>  <b>Example:</b> Router# configure terminal	Enters global configuration mode.
Step 3	<b>bba-group pppoe</b> { <i>group-name</i>   <b>global</b> }  <b>Example:</b> Router(config)# bba-group pppoe server-selection	Defines a PPPoE profile, and enters BBA group configuration mode. <ul style="list-style-type: none"> <li>• The <b>global</b> keyword creates a profile that serves as the default profile for any PPPoE port.</li> </ul>
Step 4	<b>pppoe server circuit-id delay</b> <i>milliseconds</i> <b>string</b> [ <b>contains</b> ] <i>circuit-id-string</i>  <b>Example:</b> Router(config-bba-group)# pppoe server circuit-id delay 45 string circuit ATM1/0/0 VC 0/100	(Optional) Specifies the delay to be applied based on the PPPoE tag circuit ID from the client. <ul style="list-style-type: none"> <li>• The <b>contains</b> keyword can find a partial match for this delay statement.</li> <li>• The value for the <i>circuit-id-string</i> argument can contain spaces when enclosed with double quotation marks (for example, "circuit ATM1/0/0 VC 0/100").</li> </ul>
Step 5	<b>pppoe server remote-id delay</b> <i>milliseconds</i> <b>string</b> [ <b>contains</b> ] <i>remote-id-string</i>  <b>Example:</b> Router(config-bba-group)# pppoe server remote-id delay 30 string XTH-TEST	(Optional) Specifies the delay to be applied based on the PPPoE tag remote ID from the client. <ul style="list-style-type: none"> <li>• The <b>contains</b> keyword can find a partial match for this delay statement.</li> <li>• The value for the <i>remote-id-string</i> argument can contain spaces when enclosed with double quotation marks (for example, "subscr mac 1111.2222.3333").</li> </ul>

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	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 6</b>	<p><b>pado delay circuit-id milliseconds</b></p> <p><b>Example:</b> Router(config-bba-group)# pado delay circuit-id 35</p>	<p>(Optional) Finds a match based on the PPPoE group circuit ID delay if configured.</p> <ul style="list-style-type: none"> <li>If a circuit ID cannot be matched partially, a delay is applied based on any circuit ID that is present.</li> </ul>
<b>Step 7</b>	<p><b>pado delay remote-id milliseconds</b></p> <p><b>Example:</b> Router(config-bba-group)# pado delay remote-id 30</p>	<p>(Optional) Finds a match based on the PPPoE group remote ID delay if configured.</p>
<b>Step 8</b>	<p><b>pado delay milliseconds</b></p> <p><b>Example:</b> Router(config-bba-group)# pado delay 45</p>	<p>(Optional) Uses the group PADO delay configuration.</p> <ul style="list-style-type: none"> <li>The PADO delay value is sought if the PADO delay is not found after several attempts.</li> </ul>
<b>Step 9</b>	<p><b>end</b></p> <p><b>Example:</b> Router(config-bba-group)# end</p>	<p>Ends the configuration session and returns to privileged EXEC mode.</p>

**Troubleshooting Tips**

Use the **debug pppoe event** command to verify the Smart Server PADO delay selection.

**Configuring PPPoE Service PADO Delay**

Perform this task to specify a delay based on the PPPoE service. A delay is applied to the PADO offering based on the service name match.

**SUMMARY STEPS**

- enable**
- configure terminal**
- policy-map type service *polycymap-name***
- exit**
- bba-group [global | *profile-name*]**
- virtual-template *interface-number***
- service profile *polycymap-name* refresh *minutes***
- service name match**
- end**

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**DETAILED STEPS**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	<p><b>enable</b></p> <p><b>Example:</b> Router&gt; enable</p>	<p>Enables privileged EXEC mode.</p> <ul style="list-style-type: none"> <li>• Enter your password if prompted.5</li> </ul>
<b>Step 2</b>	<p><b>configure terminal</b></p> <p><b>Example:</b> Router# configure terminal</p>	<p>Enters global configuration mode.</p>
<b>Step 3</b>	<p><b>policy-map type service <i>policymap-name</i></b></p> <p><b>Example:</b> Router(config)# policy-map type service serv3</p>	<p>Places the router in service policy map configuration mode, and defines the name of service policy map.</p>
<b>Step 4</b>	<p><b>exit</b></p> <p><b>Example:</b> Router(config)# exit</p>	<p>Exits configuration mode and returns to EXEC command mode.</p>
<b>Step 5</b>	<p><b>bba-group pppoe [<b>global</b>   <i>profile-name</i>]</b></p> <p><b>Example:</b> Router(config-bba-group)# bba-group pppoe global</p>	<p>Defines a PPPoE profile, and enters BBA group configuration mode.</p> <ul style="list-style-type: none"> <li>• The <b>global</b> keyword creates a profile that serves as the default profile for any PPPoE port.</li> </ul>
<b>Step 6</b>	<p><b>virtual-template <i>interface-number</i></b></p> <p><b>Example:</b> (config-bba-group)# virtual-template 20</p>	<p>Specifies the virtual template interface number for the BBA group, and places the router in configuration BBA group mode.</p>
<b>Step 7</b>	<p><b>service profile <i>subscriber-profile-name</i> refresh <i>minutes</i></b></p> <p><b>Example:</b> Router(config-bba-group)# service profile serv3 refresh 30</p>	<p>Specifies the subscriber profile to be associated with the BBA group, and the refresh interval minutes for the service profile.</p>
<b>Step 8</b>	<p><b>service name match</b></p> <p><b>Example:</b> Router(config-bba-group)# service name match</p>	<p>Matches the requested tag for the PPPoE global group.</p> <p><b>Note</b> The <b>service name match</b> command must be configured per the PPPoE service delay. The requested service by the client should also be configured on the BRAS to ensure PADO response from the BRAS.</p>
<b>Step 9</b>	<p><b>end</b></p> <p><b>Example:</b> (config-bba-group)# end</p>	<p>Ends the configuration session and returns to privileged EXEC mode.</p>

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## Troubleshooting Tips

Use the **debug pppoe event** command to verify the service name match and PADO delay for a PPPoE service.

# Configuration Examples for PPPoE Smart Server Selection

This section provides the following configuration examples:

- [Configuring BBA Group PADO Delay: Example, page 7](#)
- [Configuring PADO Delay: Example, page 7](#)
- [Configuring PPPoE Service PADO Delay, page 5](#)
- [Verifying the PPPoE Service Match and PADO Delay: Example, page 8](#)

## Configuring BBA Group PADO Delay: Example

The following example shows how to configure a BBA group for PADO delay:

```
Router(config)# bba-group pppoe server-selection
Router(config-bba-group)# pado delay 45
```

## Configuring PADO Delay: Example

The following example shows how to match the string by using a circuit ID or remote ID delay configured for PPPoE server:

```
Router(config-bba-group)# pppoe server circuit-id delay 45 string "subscr mac
1111.2222.3333"
Router(config-bba-group)# pado delay circuit-id 35
Router(config-bba-group)# pado delay remote-id 30
```

The following example shows how to configure PADO delay based on the remote ID or circuit ID:

```
Router(config-bba-group)# pppoe server remote-id delay 20 string contains TEST
Router(config-bba-group)# pppoe server remote-id delay 10 string XTH
Router(config-bba-group)# pppoe server remote-id delay 30 string contains XTH-TEST
```

Generally, the first match found in the list is considered for the delay value. If the remote ID in the client PPPoE tag contains XTH-TEST, then the delay value is 20. In this case, the first match succeeds and the configuration never reaches a delay of 30. If the remote ID in the client PPPoE tag contains TH- no, then no match is found.

## Configuring PPPoE Service PADO Delay: Example

The following example shows how to configure the PADO delay based on the PPPoE service:

```
Router(config)# policy-map type service XTH-services
Router(config-service-policymap)# pppoe service ILoBr delay 1000
Router(config-service-policymap)# pppoe service xth-service1 delay 500
Router(config-service-policymap)# pppoe service service-nodelay
Router(config-service-policymap)# exit
```

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```
Router(config)# bba-group pppoe server-selection
Router(config-bba-group)# service svc-group
Router(config-bba-group)# service profile XTH-services
Router(config-bba-group)# service name match
Router(config-bba-group)# virtual-template 1
```

## Verifying the PPPoE Service Match and PADO Delay: Example

The following example shows the output of the service name match and PADO delay for a PPPoE service using the **show pppoe derived group** *group-name* command. This command prints all the PPPoE services for the supported groups and also shows the associated delay for this service.

```
Router# show pppoe derived group svc-group

Derived configuration from subscriber profile 'XTH-services':
Service names: servicename:pado-delay
ILoBr:1000, xth-service1:500, service nodelay:0
```

## Additional References

The following sections provide references related to the PPPoE Smart Server Selection feature.

### Related Documents

Related Topic	Document Title
Configuring broadband and DSL	<a href="#">Cisco IOS XE Broadband and DSL Configuration Guide</a>
Additional information about commands used in this document	<ul style="list-style-type: none"> <li><a href="#">Cisco IOS Broadband Access Aggregation and DSL Command Reference</a></li> <li><a href="#">Cisco IOS Master Command List, All Releases</a></li> </ul>

### Standards

Standard	Title
None	–

### MIBs

MIB	MIBs Link
None	To locate and download MIBs for selected platforms, Cisco IOS XE releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>



**REVIEW DRAFT – CISCO CONFIDENTIAL****RFCs**

<b>RFC</b>	<b>Title</b>
RFC 2516	<i>A Method for Transmitting PPP over Ethernet (PPPoE)</i>

**Technical Assistance**

<b>Description</b>	<b>Link</b>
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<p><a href="http://www.cisco.com/techsupport">http://www.cisco.com/techsupport</a></p>

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# Feature Information for PPPoE Smart Server Selection

Table 1 lists the release history for this feature.

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**Note**

Table 1 lists only the Cisco IOS XE software release that introduced support for a given feature in a given Cisco IOS XE software release train. Unless noted otherwise, subsequent releases of that Cisco IOS XE software release train also support that feature.

**Table 1** Feature Information for PPPoE Smart Server Selection

Feature Name	Releases	Feature Information
PPPoE Smart Server Selection	Cisco IOS XE Release 2.4	PPPoE Smart Server Selection allows service providers to determine which Broadband Remote Access Server (BRAS) a PPP call will terminate on.

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