PPPoE Smart Server Selection

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.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and 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 table.

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

Information About PPPoE Smart Server Selection

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

Configuring BBA Group PADO Delay

Perform this task to allow all calls coming into a defined BBA group on a Broadband Remote Access Server (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 Internet Service Providers (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*

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.

	Command or Action	Purpose
Step 3	**bba-group pppoe** {*group-name* | **global**} **Example:** `Device(config)# bba-group pppoe server-selection`	Defines a PPP over Ethernet (PPPoE) profile, and enters BBA group configuration mode. • The **global** keyword creates a profile, which serves as the default profile for any PPPoE port that is not assigned a specific profile.
Step 4	**pado delay** *milliseconds* **Example:** `Device(config-bba-group)# pado delay 512`	Sets the time by which a PADO response is delayed for a BBA group. **Note** The value assigned for milliseconds should be a multiple of 256. Even though the device allows other values, the Cisco Software rounds the values down to the closest multiple of 256.

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. It 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 Configuring PADO Delay Based on Remote ID or Circuit ID 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.

Note The value assigned for milliseconds should be a multiple of 256. Even though the device allows other values, the Cisco Software rounds the values down to the closest multiple of 256.

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	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**bba-group pppoe** {*group-name* | **global**} **Example:** `Device(config)# bba-group pppoe server-selection`	Defines a PPPoE profile, and enters BBA group configuration mode. • The **global** keyword creates a profile that serves as the default profile for any PPPoE port.
Step 4	**pppoe server circuit-id delay** *milliseconds* **string** [**contains**] *circuit-id-string* **Example:** `Device(config-bba-group)# pppoe server circuit-id delay 256 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. • The **contains** keyword can find a partial match for this delay statement. • The value for the *circuit-id-string*argumentcan contain spaces when enclosed with double quotation marks (for example, "circuit ATM1/0/0 VC 0/100").
Step 5	**pppoe server remote-id delay** *milliseconds* **string** [**contains**] *remote-id-string*	(Optional) Specifies the delay to be applied based on the PPPoE tag remote ID from the client.

	Command or Action	Purpose
	Example: `Device(config-bba-group)# pppoe server remote-id delay 512 string XTH-TEST`	• The **contains** keyword can find a partial match for this delay statement. • The value for the *remote-id-string*argumentcan contain spaces when enclosed with double quotation marks (for example, "subscr mac 1111.2222.3333").
Step 6	**pado delay circuit-id** *milliseconds* **Example:** `Device(config-bba-group)# pado delay circuit-id 768`	(Optional) Finds a match based on the PPPoE group circuit ID delay if configured.. • If a circuit ID cannot be matched partially, a delay is applied based on any circuit ID that is present.
Step 7	**pado delay remote-id** *milliseconds* **Example:** `Device(config-bba-group)# pado delay remote-id 256`	(Optional) Finds a match based on the PPPoE group remote ID delay if configured..
Step 8	**pado delay** *milliseconds* **Example:** `Device(config-bba-group)# pado delay 512`	(Optional) Uses the group PADO delay configuration. Sets the time by which a PADO response is delayed for a BBA group. • The PADO delay value is sought if the PADO delay is not found after several attempts.
Step 9	**end** **Example:** `Device(config-bba-group)# end`	Ends the configuration session and returns to privileged EXEC mode.

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

1. **enable**
2. **configure terminal**
3. **policy-map type service** *policymap-name*
4. **exit**
5. **bba-group pppoe** [**global** | *profile-name*]
6. **virtual-template** *interface-number*
7. **service profile** *subscriber-profile-name* **refresh** *minutes*
8. **service name match**
9. **pado delay** *milliseconds*
10. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**policy-map type service** *policymap-name* **Example:** `Device(config)# policy-map type service serv3`	Places the device in service policy map configuration mode, and defines the name of service policy map.
Step 4	**exit** **Example:** `Device(config-service-policymap)# exit`	Exits service policy map configuration mode and returns to global configuration mode.
Step 5	**bba-group pppoe** [**global**	*profile-name*] **Example:** `Device(config-bba-group)# bba-group pppoe global`	Defines a PPPoE profile, and enters BBA group configuration mode. • The **global** keyword creates a profile that serves as the default profile for any PPPoE port.

	Command or Action	Purpose
Step 6	**virtual-template** *interface-number* **Example:** `Device(config-bba-group)# virtual-template 20`	Specifies the virtual template interface number for the BBA group, and places the device in configuration BBA group mode.
Step 7	**service profile** *subscriber-profile-name* **refresh** *minutes* **Example:** `Device(config-bba-group)# service profile serv3 refresh 30`	Specifies the subscriber profile to be associated with the BBA group, and the refresh interval minutes for the service profile.
Step 8	**service name match** **Example:** `Device(config-bba-group)# service name match`	Matches the requested tag for the PPPoE global group. **Note** The **service name match** 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.
Step 9	**pado delay** *milliseconds* **Example:** `Device(config-bba-group)# pado delay 512`	(Optional) Uses the group PADO delay configuration. Sets the time by which a PADO response is delayed for a BBA group. • The PADO delay value is sought if the PADO delay is not found after several attempts. **Note** The value assigned for milliseconds should be a multiple of 256. Even though the device allows other values, the Cisco Software rounds the values down to the closest multiple of 256.
Step 10	**end** **Example:** `Device(config-bba-group)# end`	Ends the configuration session and returns to privileged EXEC mode.

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

Configuring BBA Group PADO Delay Example

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

```
Device> enable
Device# configure terminal
Device(config)# bba-group pppoe server-selection
Device(config-bba-group)# pado delay 512
Device(config-bba-group)# end
```

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:

```
Device> enable
Device# configure terminal
Device(config)# bba-group pppoe server-selection
Device(config-bba-group)# pppoe server circuit-id delay 256 string "subscr mac 1111.2222.3333"
Device(config-bba-group)# pado delay circuit-id 512
Device(config-bba-group)# pado delay remote-id 768
Device(config-bba-group)# end
```

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

```
Device> enable
Device# configure terminal
Device(config)# bba-group pppoe server-selection
Device(config-bba-group)# pppoe server remote-id delay 512 string contains TEST
Device(config-bba-group)# pppoe server remote-id delay 256 string XTH
Device(config-bba-group)# pppoe server remote-id delay 768 string contains XTH-TEST
Device(config-bba-group)# end
```

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 512. In this case, the first match succeeds and the configuration never reaches a delay of 768. 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:

```
Device> enable
Device# configure terminal
Device(config)# policy-map type service XTH-services
Device(config-service-policymap)# pppoe service ILoBr delay 768
Device(config-service-policymap)# pppoe service xth-service1 delay 256
Device(config-service-policymap)# pppoe service service-nodelay
Device(config-service-policymap)# exit
Device(config)# bba-group pppoe server-selection
Device(config-bba-group)# virtual-template 1
Device(config-bba-group)# service svc-group
```

```
Device(config-bba-group)# service profile XTH-services
Device(config-bba-group)# service name match
Device(config-bba-group)# pado delay 512
Device(config-bba-group)# end
```

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.

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

Derived configuration from subscriber profile 'XTH-services':
Service names: servicename:pado-delay
ILoBr:768, xth-service1:256, 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	*Cisco IOS XE Broadband and DSL Configuration Guide*
Additional information about commands used in this document	• *Cisco IOS Broadband Access Aggregation and DSL Command Reference* • Cisco IOS Master Command List, All Releases

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: http://www.cisco.com/go/mibs

RFCs

RFC	Title
RFC 2516	*A Method for Transmitting PPP over Ethernet (PPPoE)*

Technical Assistance

Description	Link
The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies. 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. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/techsupport

Feature Information for PPPoE Smart Server Selection

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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

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.