



PPPoE Session Limiting on Inner QinQ VLAN

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The PPPoE Session Limiting on Inner QinQ VLAN feature allows a service provider to limit each customer to one PPPoE client in use by providing the ability to limit the number of PPPoE over QinQ (IEEE 802.1Q VLAN tunnel) sessions based on the inner VLAN ID configured under a subinterface. This capability eliminates the need to configure large numbers of subinterfaces.

Finding Feature Information in This Module

Your Cisco IOS software release may not support all of the features documented in this module. To reach links to specific feature documentation in this module and to see a list of the releases in which each feature is supported, use the “[Feature Information for PPPoE Session Limiting on Inner QinQ VLAN](#)” section on [page 10](#).

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Prerequisites for PPPoE Session Limiting on Inner QinQ VLAN

- PPPoE server functionality must be configured.
- The PPPoE over IEEE 802.1Q VLANs feature must be configured.

Restrictions for PPPoE Session Limiting on Inner QinQ VLAN

- Do not configure the inner VLAN session limit to be greater than the outer session limit.

Information About PPPoE Session Limiting on Inner QinQ VLAN

To configure the PPPoE Session Limiting on Inner QinQ VLAN feature, you should understand the following concepts:

- [Benefits of PPPoE Session Limiting on Inner QinQ VLAN, page 2](#)
- [Feature Design of PPPoE Session Limiting on Inner QinQ VLAN, page 2](#)

Benefits of PPPoE Session Limiting on Inner QinQ VLAN

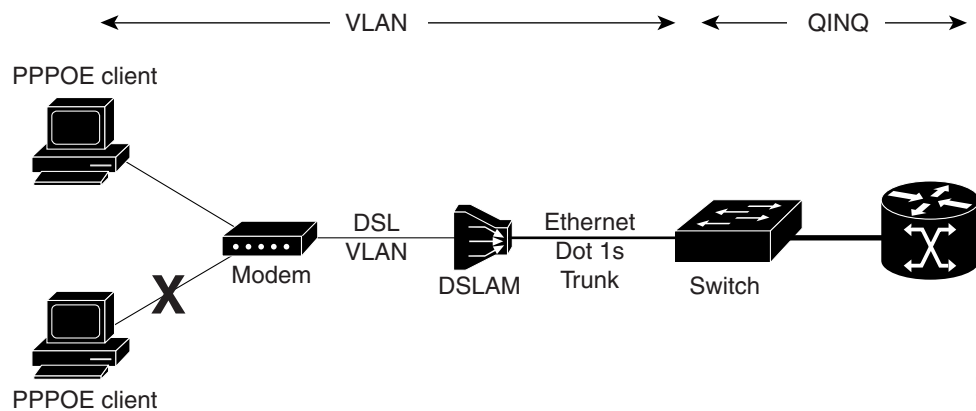
- Facilitates the ability to provision thousands of PPPoE over QinQ sessions having unique inner VLANs using simpler and easier to manage configurations.
- Allows service providers to limit PPPoE sessions based on the QinQ inner VLAN ID.

Feature Design of PPPoE Session Limiting on Inner QinQ VLAN

Prior to the PPPoE Session Limiting on Inner QinQ VLAN feature, PPPoE session limiting required a QinQ subinterface to be configured for each QinQ inner VLAN to be session limited, resulting in configuration requirements that did not scale to large numbers of QinQ VLAN ID pairs. The PPPoE Session Limiting on Inner QinQ VLAN feature adds broadband remote access server (BRAS) capability for configuring a single subinterface for all the unique inner VLAN IDs per outer VLAN while limiting one session per inner VLAN.

[Figure 1](#) shows a typical implementation of the PPPoE Session Limiting on Inner QinQ VLAN feature.

Figure 1 PPPoE over QinQ Session Limiting



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How to Configure PPPoE Session Limiting on Inner QinQ VLAN

This section contains the following procedures:

- [Configuring PPPoE Session Limiting on Inner QinQ VLAN, page 3](#)

Configuring PPPoE Session Limiting on Inner QinQ VLAN

The following task configures PPPoE over QinQ session limiting and allows you to limit the number of QinQ inner VLAN connections for each customer.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **bba-group pppoe group-name**
4. **sessions per-vlan limit outer-per-vlan-limit inner inner-per-vlan-limit**
5. **end**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router> enable	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode.
Step 3	bba-group pppoe group-name Example: Router(config)# bba-group pppoe group 1	Creates a PPPoE profile.
Step 4	sessions per-vlan limit outer-per-vlan-limit inner inner-per-vlan limit Example: Router(config-bba-group)# sessions per-vlan 400 inner 1	Configures inner and outer VLAN limits.
Step 5	end Example: Router(config-bba-group)# end	(Optional) Exits the current configuration mode.

Examples

The following example enables PPPoE over QinQ session limiting on Ethernet interface 1/0/0.1 with outer VLAN ID 10 and a unique inner VLAN ID for each session.

```
bba-group pppoe group1
    virtual-template 1
    sessions per-vlan limit 1000 inner 1
interface eth1/0/0.1
    encapsulation dot1q 10 second-dot1q any
    pppoe enable group group1
```

Troubleshooting Tips

The following commands can help troubleshoot PPPoE session limiting:

- show pppoe session**
- show pppoe summary**
- debug pppoe error**

Configuration Examples for PPPoE Session Limiting on Inner QinQ VLAN

This section provides the following configuration example:

- [PPPoE Session Limiting on Inner QinQ VLAN: Example, page 5](#)

PPPoE Session Limiting on Inner QinQ VLAN: Example

The following example shows the commands used to configure the PPPoE Session Limiting on Inner QinQ VLAN feature on the Cisco 10000:

```
Router# show running-config
!
!
bba-group pppoe PPPOE-LIMIT
 virtual-template 1
 sessions per-mac limit 1000
 sessions per-vlan limit 1000 inner 1
!
interface FastEthernet1/1.201
 description connected to Cat Switch
 encapsulation dot1Q 201
 pppoe enable group PPPOE-LIMIT
!
interface FastEthernet1/1.202
 description connected to Cat Switch
 encapsulation dot1Q 202
 pppoe enable group PPPOE-LIMIT
!
interface Virtual-Template1
 ip address negotiated
 no logging event link-status
 ppp chap hostname pppoeuser
 ppp chap password 0 cisco
!
end
```

The following example shows the commands used to configure a Catalyst switch (see [Figure 1](#)) to transport PPPoE over inner QinQ:

```
Router# show running-config
!
!
interface FastEthernet0/1
 description connected to UUT
 switchport trunk encapsulation dot1q
 switchport trunk allowed vlan 301
 switchport mode trunk
!
interface FastEthernet0/2
 description connected to Client
 switchport access vlan 301
 switchport mode dot1q-tunnel
```

Additional References

The following sections provide references related to the PPPoE Session Limiting on Inner QinQ VLAN feature.

Related Documents

Related Topic	Document Title
Broadband access aggregation concepts	Cisco IOS Broadband and DSL Configuration Guide, Release 12.4
Broadband access commands	Cisco IOS Broadband Access Aggregation and DSL Command Reference, Release 12.4T

Standards

Standard	Title
IEEE Standard 802.1Q	<i>Virtual Bridged Local Area Networks</i>

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature.	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
RFC 2516	<i>PPP over Ethernet</i>

Technical Assistance

Description	Link
The Cisco Technical Support & Documentation website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport

Command Reference

This section documents the following modified commands.

- [sessions per-vlan limit](#)

sessions per-vlan limit

To specify the maximum number of PPP over Ethernet (PPPoE) sessions permitted per VLAN ID pair in a PPPoE profile, use the **sessions per-vlan limit** command in BBA group configuration mode. To remove this specification, use the **no** form of this command.

sessions per-vlan limit *outer-per-vlan-limit* **inner** *inner-per-vlan-limit*

no sessions per-vlan limit *outer-per-vlan-limit* **inner** *inner-per-vlan-limit*

Syntax Description

<i>outer-per-vlan-limit</i>	Maximum number of PPPoE sessions permitted per outer VLAN ID. The default is 100. Range is 1 to the maximum number of interfaces allowed on the platform.
inner <i>inner-per-vlan-limit</i>	Maximum number of PPPoE sessions permitted per inner VLAN ID. The default is 100. Range is 1 to the maximum number of interfaces allowed on the platform.

Defaults

Sessions: 100

Command Modes

BBA group configuration

Command History

Release	Modification
12.2(15)T	This command was introduced.
12.3(7)XI3	This command was integrated into Cisco IOS Release 12.3(7)XI3.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB and the inner inner-per-vlan-limit keyword and argument were added.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.

Usage Guidelines

Use the **sessions per-vlan limit** command to configure a PPPoE profile with the maximum number of PPPoE sessions that will be allowed per VLAN ID pair. By limiting the number of inner VLAN sessions you can reduce the number of subinterfaces required to support QinQ sessions per unique outer and inner VLAN IDs.

You cannot configure session limits in PPPoE profiles and directly on VLANs simultaneously.

You cannot configure the inner VLAN limit to be greater than the outer VLAN limit.

Examples

The following example shows a limit of 1000 PPPoE sessions per inner VLAN ID configured in the PPPoE profile named group 1:

```
bba-group ppoe group1
virtual-template 1
sessions per-vlan limit 1000 inner 1
```

Related Commands	Command	Description
	bba-group pppoe	Creates a PPPoE profile.
	sessions max limit	Configures a PPPoE global profile with the maximum number of PPPoE sessions that will be permitted on a router and sets the PPPoE session-count threshold.
	sessions per-mac limit	Sets the maximum number of PPPoE sessions allowed per MAC address in a PPPoE profile.
	sessions per-vc limit	Sets the maximum number of PPPoE sessions to be established over a VC in a PPPoE profile and sets the PPPoE session-count threshold.

Feature Information for PPPoE Session Limiting on Inner QinQ VLAN

Table 1 lists the release history for this feature.

Not all commands may be available in your Cisco IOS software release. For release information about a specific command, see the command reference documentation.

Cisco IOS software images are specific to a Cisco IOS software release, a feature set, and a platform. Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at <http://www.cisco.com/go/fn>. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.



Note

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

Table 1 Feature Information for PPPoE Session Limiting on Inner QinQ VLAN

Feature Name	Releases	Feature Information
PPPoE Session Limiting on Inner QinQ VLAN	12.2(31)SB2	The PPPoE Session Limiting on Inner QinQ VLAN feature provides the ability to limit the number of PPPoE over QinQ, (IEEE 802.1Q VLAN tunnel) sessions based on the inner VLAN ID configured under a subinterface. In 12.2(31)SB2, this feature was introduced on the Cisco 10000. The following commands were modified by this feature: session per-vlan limit.

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