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 PPP over Ethernet (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

Your software release may not support all the features documented in this module. 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 Session Limiting on Inner QinQ VLAN" section on page 8.

Use Cisco Feature Navigator to find information about platform support and Cisco IOS and Catalyst OS 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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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

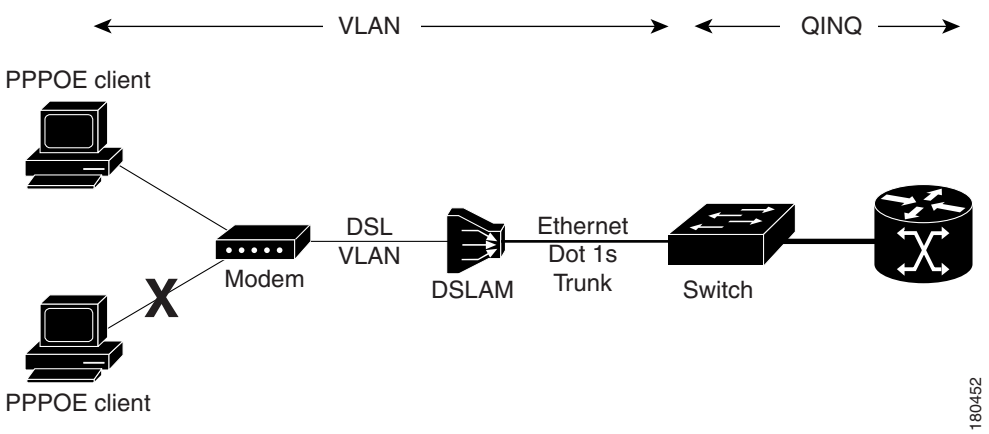
- Facilitates the ability to provision thousands of PPPoE over QinQ sessions having unique inner VLANs using simpler and easier to manage configurations.
- Allows service providers to limit PPPoE sessions based on the QinQ inner VLAN ID.

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



How to Configure PPPoE Session Limiting on Inner QinQ VLAN

This section contains the following procedure:

- Configuring PPPoE Session Limiting on Inner QinQ VLAN, page 3

Configuring PPPoE Session Limiting on Inner QinQ VLAN

Perform this task to configure PPPoE over QinQ session limiting, which 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** *per-vlan-limit* **inner** *per-QinQ-inner-limit*
5. **end**
6. **show pppoe session**
7. **show pppoe summary**

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** *per-vlan-limit* **inner** *per-QinQ-inner-limit* **Example:** `Router(config-bba-group)# sessions per-vlan limit 400 inner 65`	Configures inner and outer VLAN limit.
Step 5	**end** **Example:** `Router(config-bba-group)# end`	(Optional) Exits the current configuration mode.
Step 6	**show pppoe session** **Example:** `Router# show pppoe session`	(Optional) Displays information about currently active PPPoE sessions.
Step 7	**show pppoe summary** **Example:** `Router# show pppoe summary`	(Optional) Displays summary of the currently active PPPoE sessions.

Examples

The following is a sample output from the **show pppoe session** command:

```
Router# show pppoe session

     1 session  in FORWARDED (FWDED) State
     1 session  total


Uniq ID  PPPoE  RemMAC          Port     VT    VA      State    LocMAC          VA-st
         SID
26       19     0001.96da.a2c0  Et0/0.1  5     N/A     RELFWD   000c.8670.1006  VLAN:3434
```

The following is a sample output from the **show pppoe summary** command:

```
Router# show pppoe summary

PTA  : Locally terminated sessions
    FWDED: Forwarded sessions
    TRANS: All other sessions (in transient state)

                      TOTAL     PTA   FWDED   TRANS
TOTAL                 20434   20434       0       0
GigabitEthernet2/0/0   4096    4096       0       0
ATM3/0/0              16247   16247       0       0
```

Troubleshooting Tips

The following commands can help troubleshoot PPPoE session limiting:

- **debug pppoe errors**
- **show pppoe session**
- **show pppoe summary**

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 how to enable PPPoE over QinQ session limiting on Ethernet interface 3/1.1 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 65
interface ethernet3/1.1
 encapsulation dot1q 10 second-dot1q any
 enable group group1
```

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

```
bba-group pppoe PPPOE-LIMIT
 virtual-template 1
sessions per-mac limit 1000 inner 65
!
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 how to configure a Catalyst switch (see Figure 1) to transport PPPoE over inner QinQ:

```
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*
Broadband access commands	*Cisco IOS Broadband Access Aggregation and DSL Command Reference*

Standards

Standard	Title
IEEE Standard 802.1Q	*Virtual Bridged Local Area Networks*

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	*PPP over Ethernet*

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 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.

Use Cisco Feature Navigator to find information about platform support and software image support. Cisco Feature Navigator enables you to determine which Cisco IOS and Catalyst OS software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on Cisco.com is not required.

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 12.2(33)SRC 15.0(1)M	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 Cisco IOS Release 12.2(31)SB2, this feature was introduced on the Cisco 10000. This feature was integrated into Cisco IOS Release 12.2(33)SRC. This feature was integrated into Cisco IOS Release 15.0(1)M. The following commands were introduced or modified: **debug pppoe**, **session per-vlan limit**, **show pppoe session**.