802.1P CoS Bit Set for PPP and PPPoE Control Frames

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The 802.1P CoS Bit Set for PPP and PPPoE Control Frames feature provides the ability to set user priority bits in the IEEE 802.1Q tagged frame to allow traffic prioritization. This capability enables a way to provide best effort quality of service (QoS) or class of service (CoS) at layer 2 without requiring reservation setup.

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 802.1P CoS Bit Set for PPP and PPPoE Control Frames" section on page 7.

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 802.1P CoS Bit Set for PPP and PPPoE Control Frames

The PPPoE over 802.1Q VLAN feature must be enabled.

Restrictions for 802.1P CoS Bit Set for PPP and PPPoE Control Frames

You cannot set different CoS levels for PPP and PPPoE control packets; all control packets default to a CoS level set at 7.

Information About 802.1P CoS Bit Set for PPP and PPPoE Control Frames

To understand more about the 802.1P CoS Bit Set for PPP and PPPoE Control Frames feature, you should know the following concepts:

Benefits of 802.1P CoS Bit Set for PPP and PPPoE Control Frames

The 802.1P CoS Bit Set for PPP and PPPoE Control Frames feature facilitates moving from ATM-based to Ethernet-based networks by supporting the ability to offer prioritized traffic services, VoIP, and other premium services.

Feature Design of 802.1P CoS Bit Set for PPP and PPPoE Control Frames

The IEEE 802.1P specification is an extension of the IEEE 802.1Q VLANs tagging standard and enables Layer 2 devices to prioritize traffic by using an 802.1P header that includes a three-bit user priority field. Prior to the 802.1P CoS Bit Set for PPP and PPPoE Control Frames feature, PPPoE sessions that were established over 802.1Q VLANs did not make use of the user priority field. If congestion occurs when the 802.1P CoS bit is not set, PPP keepalive packets can be lost, which can result in disconnection of an established session with loss of service to the end user. Congestion caused by noncontrol packets can also prevent new sessions from being established, which can also result in denying service to the end user.

The 802.1P CoS Bit Set for PPP and PPPoE Control Frames feature introduced in Cisco IOS Release 12.2(31)SB supports the ability of Layer 2 devices to prioritize traffic by making use of the priority field of the 802.1P control packets. PPPoE sessions established over 802.1Q VLANs use the priority header field to provide best efforts QoS or CoS at Layer 2 without involving reservation setup. 802.1P traffic is marked and sent to the destination, and no bandwidth reservations are established.

During network congestion, when the Ethernet network and digital subscriber line access multiplexer (DSLAM) offer 802.1P support, control packets are offered a higher priority than noncontrol packets, thereby increasing the likelihood of reliable delivery. PPPoE control packets and PPP packets originating from the broadband remote access server (BRAS) are marked with user priority 7, the highest level of priority.

The following packets are tagged with user priority 7 in their 802.1P header:

- PPPoE packets
  - PPPoE Active Discovery Offer (PADO)
  - PPPoE Active Discovery Session Confirmation (PADS)
- PPP packets
  - Link Control Protocol (LCP)
  - Network Control Protocol (NCP) (Internet Protocol Control Protocol (IPCP))
  - Authentication
  - Keepalive

How to Configure 802.1P CoS Bit Set for PPP and PPPoE Control Frames

This section contains the following procedures:

- Configuring 802.1P CoS Bit Set for PPP and PPPoE Control Frames, page 3
- Setting 802.1P Priority Bits for PPPoE Control Frames, page 3

Configuring 802.1P CoS Bit Set for PPP and PPPoE Control Frames

The 802.1P CoS Bit Set for PPP and PPPoE Control Frames feature is enabled by default and requires no configuration.

Setting 802.1P Priority Bits for PPPoE Control Frames

Perform this task to set the 802.1P priority bits in 802.1Q frames containing PPP over Ethernet (PPPoE) control packets.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **bba-group pppoe** *group-name*

4. **control-packets vlan cos** *priority*
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	**control-packets vlan cos** *priority* **Example:** `Router(config-bba-group)# control-packets vlan cos 6`	Sets the802.1P priority bits in 802.1Q frames containing PPPoE control packets.
Step 5	**end** **Example:** `Router(config-bba-group)# end`	(Optional) Exits the current configuration mode.

Troubleshooting Tips

The following command can help troubleshoot 802.1P control frame marking:

- **debug pppoe error**

Configuration Examples for 802.1P CoS Bit Set for PPP and PPPoE Control Frames

This section provides the following configuration example:

- Setting 802.1P Priority Bits for PPPoE Control Frames: Example, page 5

Setting 802.1P Priority Bits for PPPoE Control Frames: Example

The following example shows how to set the 802.1P priority bits in 802.1Q frames containing PPP over Ethernet (PPPoE) control packets:

```
Router> enable
Router# configure terminal
Router(config)# bba-group pppoe group1
Router(config-bba-group)# control-packets vlan cos 6
```

Additional References

The following sections provide references related to the 802.1P CoS Bit Set for PPP and PPPoE Control Frames 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 802.1P	*PPPoE over IEEE 802.1Q*
IEEE Standard 802.1Q	*Virtual Bridged Local Area Networks*

MIBs

MIB	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified 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 802.1P CoS Bit Set for PPP and PPPoE Control Frames

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 802.1P CoS Bit Set for PPP and PPPoE Control Frames

Feature Name	Releases	Feature Information
802.1P CoS Bit Set for PPP and PPPoE Control Frames	12.2(31)SB2 12.2(33)SRC 15.0(1)M	The 802.1P CoS Bit Set for PPP and PPPoE Control Frames feature provides the ability to set user priority bits in the IEEE 802.1Q tagged frame to allow traffic prioritization. This capability enables a way to provide best effort quality of service (QoS) or class of service (CoS) at layer 2 without requiring reservation setup. This feature was introduced in Cisco IOS Release 12,2(31)SB2. 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: **control-packets vlan cos**.