

802.1P CoS Bit Set for PPP and PPPoE Control Frames

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.

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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 Point-to-Point Protocol over Ethernet (PPPoE) control packets; all control packets default to a CoS level set at 0.

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

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

The command can help troubleshoot 802.1P control frame marking: **debug pppoe error**

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, Voice over Internet Protocol (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. 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 also can result in denying service to the end user.

PPPoE sessions established over 802.1Q VLANs use the priority header field to provide best-effort 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.

In Cisco IOS XE Release 2.4, PPPoE sessions established over IEEE 802.1Q VLAN make use of the priority field of the IEEE 802.1p header by setting the CoS field to user priority 7.

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 0, the highest level of priority.

The following packets are tagged with user priority 0 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

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

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

The following task explains how to change the CoS setting for PPP and PPPoE control frames over 802.1Q VLAN.

Setting 802.1P Priority Bits in 802.1Q Frames Containing PPPoE Control Packets

This task explains how to change the CoS settings for PPP and PPPoE control frames over 802.1Q VLAN.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **bba-group pppoe group-name**
4. **control-packets vlan cos priority**
5. **exit**
6. **bba-group pppoe group-name**
7. **control-packets vlan cos priority**
8. **exit**

DETAILED STEPS

Procedure

	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.

	Command or Action	Purpose
Step 3	**bba-group pppoe group-name** **Example:** `Router(config)# bba-group pppoe global`	Specifies the BBA group and enters BBA group configuration mode.
Step 4	**control-packets vlan cos priority** **Example:** `Router(config-bba-group)# control-packets vlan cos 5`	Sets the PPPoE control packets associated with the BBA group.
Step 5	**exit** **Example:** `Router(config-bba-group)# exit`	Exits BBA group configuration mode, and returns to global configuration mode.
Step 6	**bba-group pppoe group-name** **Example:** `Router(config)# bba-group pppoe cisco`	Specifies the BBA group cisco and enters BBA group configuration mode.
Step 7	**control-packets vlan cos priority** **Example:** `Router(config-bba-group)# control-packets vlan cos 2`	Sets the PPPoE control packets associated with the BBA group.
Step 8	**exit** **Example:** `Router(config-bba-group)# exit`	Exits BBA group configuration mode, and returns to global configuration mode.

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 XE 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 XE software 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

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 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	Cisco IOS XE Release 2.4	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 QoS or CoS at Layer 2 without requiring reservation setup. In Cisco IOS XE Release 2.4, this feature was introduced. The following command was introduced: **control-packets vlan cos**.