QoS Policy Support for L2VPN ATM PVPs

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This document explains how to configure Quality of Service (QoS) Policy Support for Layer 2 Virtual Private Network (L2VPN) ATM permanent virtual paths (PVPs). That is, it explains how to configure QoS policies in ATM PVP mode for L2VPNs.

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 QoS Policy Support for L2VPN ATM PVPs" section on page 10.

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 QoS Policy Support for L2VPN ATM PVPs

Before configuring QoS policies on L2VPN ATM PVPs, you should understand the concepts and configuration instructions in the following document:

- *Any Transport over MPLS*

Restrictions for QoS Policy Support for L2VPN ATM PVPs

The following restrictions apply to the QoS Policy Support for L2VPN ATM PVPs feature:

- The Cisco 7600 series router does not support any queueing features in ATM PVP mode.
- When you enable a policy in PVP mode, do not configure ATM rates on the VCs that are part of the PVP. The VCs should be unspecified bit rate (UBR) VCs only.
- If VCs are part of a PVP that has a policy configured, you cannot configure ATM VC traffic shaping.
- Cisco IOS Release 12.2(33)SRE does not support cell-based ATM shaping per PVP.
- You cannot configure a queueing policy on an ATM PVP with UBR.
- You cannot configure queueing-based policies with UBR traffic shaping.

Information About QoS Policy Support for L2VPN ATM PVPs

Before configuring the QoS Policy Support for L2VPN ATM PVPs feature, you should understand the following concepts:

- MQC Structure, page 2
- Elements of a Traffic Class, page 3
- Elements of a Traffic Policy, page 3

MQC Structure

The modular QoS command-line interface (CLI) (MQC) structure allows you to define a traffic class, create a traffic policy, and attach the traffic policy to an interface.

The MQC structure is the result of the following these three high-level steps.

1. Define a traffic class by using the **class-map** command. A traffic class is used to classify traffic.
2. Create a traffic policy by using the **policy-map** command. (The terms traffic policy and policy map are often synonymous.) A traffic policy (policy map) contains a traffic class and one or more QoS features that will be applied to the traffic class. The QoS features in the traffic policy determine how to treat the classified traffic.
3. Attach the traffic policy (policy map) to the interface by using the **service-policy** command.

Elements of a Traffic Class

A traffic class contains three major elements: a traffic class name, a series of match commands, and, if more than one match command is used in the traffic class, instructions on how to evaluate these match commands.

The match commands are used for classifying packets. Packets are checked to determine whether they meet the criteria specified in the match commands; if a packet meets the specified criteria, that packet is considered a member of the class. Packets that fail to meet the matching criteria are classified as members of the default traffic class.

Elements of a Traffic Policy

A traffic policy contains three elements: a traffic policy name, a traffic class (specified with the **class** command), and the command used to enable the QoS feature.

The traffic policy (policy map) applies the enabled QoS feature to the traffic class once you attach the policy map to the interface (by using the **service-policy** command).

Note A packet can match only one traffic class within a traffic policy. If a packet matches more than one traffic class in the traffic policy, the first traffic class defined in the policy will be used.

How to Configure QoS Policy Support for L2VPN ATM PVPs

The following sections explain how to configure QoS operations in ATM PVP mode:

- Enabling a Service Policy in ATM PVP Mode, page 3 (required)
- Enabling Traffic Shaping in ATM PVP Mode, page 5 (required)
- Enabling Matching of ATM VCIs, page 6 (required)

Enabling a Service Policy in ATM PVP Mode

You can enable a service policy in ATM PVP mode. You can also enable a service policy on PVP on a multipoint subinterface.

Restrictions

- The Cisco 7600 series router does not support a service policy that uses the **match atm-vci** command in the egress direction.
- The **show policy-map interface** command does not display service policy information for ATM interfaces.
- Cisco IOS Release 12.2(33)SRE does not support cell-based ATM shaping per PVP.

SUMMARY STEPS

1. **enable**

2. **configure terminal**
3. **interface atm** *slot/port*
4. **atm pvp** *vpi* **l2transport**
5. **service-policy** [**input** | **output**] *policy-map-name*
6. **xconnect** *peer-router-id vcid* **encapsulation mpls**
7. **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	**interface atm** *slot/port* **Example:** `Router(config)# interface atm 1/0`	Defines the interface and enters interface configuration mode.
Step 4	**atm pvp** *vpi* **l2transport** **Example:** `Router(config-if)# atm pvp 1 l2transport`	Specifies that the PVP is dedicated to transporting ATM cells and enters l2transport PVP configuration mode. • The **l2transport** keyword indicates that the PVP is for cell relay. This mode is for Layer 2 transport only; it is not for regular PVPs.
Step 5	**service-policy** [**input** | **output**] *policy-map-name* **Example:** `Router(config-if-atm-l2trans-pvp)# service policy input pol1`	Enables a service policy on the specified PVP.
Step 6	**xconnect** *peer-router-id vcid* **encapsulation mpls** **Example:** `Router(config-if-atm-l2trans-pvp)# xconnect 10.0.0.1 123 encapsulation mpls`	Binds the attachment circuit to a pseudowire VC. • The syntax for this command is the same as for all other Layer 2 transports.
Step 7	**end** **Example:** `Router(config-if-atm-l2trans-pvp)# end`	Exits l2transport PVP configuration mode and returns to privileged EXEC mode.

Enabling Traffic Shaping in ATM PVP Mode

Traffic shaping commands are supported in ATM PVP mode. For egress VP shaping, one configuration command is supported for each ATM service category. The supported service categories are constant bit rate (CBR), UBR, variable bit rate-nonreal time (VBR-NRT), and variable bit rate real-time (VBR-RT).

Restrictions

- The Cisco 7600 series router does not support traffic shaping.
- Cisco IOS Release 12.2(33)SRE does not support cell-based ATM shaping per PVP.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **interface atm** *slot/port*
4. **atm pvp** *vpi* **l2transport**
5. **ubr** *pcr*
   or
   cbr *pcr*
   or
   vbr-nrt *pcr scr mbs*
   or
   vbr-rt *pcr scr mbs*
6. **xconnect** *peer-router-id vcid* **encapsulation mpls**

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	**interface atm** *slot/port* **Example:** `Router(config)# interface atm 1/0`	Defines the interface and enters interface configuration mode.
Step 4	**atm pvp** *vpi* **l2transport** **Example:** `Router(config-if)# atm pvp 1 l2transport`	Specifies that the PVP is dedicated to transporting ATM cells, and enters l2transport PVP configuration mode. • The **l2transport** keyword indicates that the PVP is for cell relay. This mode is for Layer 2 transport only; it is not for regular PVPs.

	Command or Action	Purpose

Step 5	**ubr** *pcr*
	or
	cbr *pcr*
	or
	vbr-nrt *pcr scr mbs*
	or
	vbr-rt *pcr scr mbs*
	
	Example:
	`Router(config-if-atm-l2trans-pvp)# cbr 1000`
	or
	`cbr 56`
	or
	`vbr-nrt 11760 11760 1`
	or
	`vbr-rt 640 320 80`
		Enables traffic shaping in ATM PVP mode.
		• *pcr* = peak cell rate
		• *scr* = sustain cell rate
		• *mbs* = maximum burst size

Step 6	**xconnect** *peer-router-id vcid* **encapsulation mpls** **Example:** `Router(config-if-atm-l2trans-pvp)# xconnect 10.0.0.1 123 encapsulation mpls`	Binds the attachment circuit to a pseudowire VC. • The syntax for this command is the same as for all other Layer 2 transports.

Enabling Matching of ATM VCIs

You can enable packet matching on an ATM VCI or range of VCIs using the **match atm-vci** command in class map configuration mode.

Restrictions

- When you configure the **match atm-vci** command in class map configuration mode, you can add this class map to a policy map that can be attached only to an ATM VP.
- On the Cisco 7600 series router, the **match atm-vci** command is supported only in the ingress direction on an ATM VP.
- Cisco IOS Release 12.2(33)SRE does not support cell-based ATM shaping per PVP.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **class-map** *class-map-name* [**match-all** | **match-any**]
4. **match atm-vci** *vc-id* [*-vc-id*]
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	**class-map** *class-map-name* [**match-all** | **match-any**] **Example:** `Router(config)# class-map class1`	Creates a class map to be used for matching traffic to a specified class, and enters class map configuration mode.
Step 4	**match atm-vci** *vc-id* [**-** *vc-id*] **Example:** `Router(config-cmap)# match atm-vci 50`	Enables packet matching on an ATM VCI or range of VCIs. • The range is 32 to 65535. **Note** You can use the **match not** command to match any VC except those you specify in the command.
Step 5	**end** **Example:** `Router(config-cmap)# end`	(Optional) Returns to privileged EXEC mode.

Configuration Examples for QoS Policy Support for L2VPN ATM PVPs

The following section shows an example of the QoS Policy Support for L2VPN ATM PVPs feature:

• Enabling Traffic Shaping in ATM PVP Mode: Example, page 7

Enabling Traffic Shaping in ATM PVP Mode: Example

The following example enables traffic shaping in ATM PMP mode.

```
interface atm 1/0
 atm pvp 100 l2transport
  ubr 1000
  xconnect 10.11.11.11 777 encapsulation mpls
 atm pvp 101 l2transport
  cbr 1000
  xconnect 10.11.11.11 888 encapsulation mpls
 atm pvp 102 l2transport
  vbr-nrt 1200 800 128
  xconnect 10.11.11.11 999 encapsulation mpls
```

Additional References

The following sections provide references related to the QoS Policy Support for L2VPN ATM PVPs feature.

Related Documents

Related Topic	Document Title
Cisco IOS commands	*Cisco IOS Master Commands List, All Releases*
MPLS commands	*Cisco IOS Multiprotocol Label Switching Command Reference*
Any Transport over MPLS	*Any Transport over MPLS*

Standards

Standard	Title
None	—

MIBs

MIB	MIBs Link
• None	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
None	—

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/cisco/web/support/index.html

Feature Information for QoS Policy Support for L2VPN ATM PVPs

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 QoS Policy Support for L2VPN ATM PVPs

Feature Name	Releases	Feature Information
QoS Policy Support for L2VPN ATM PVPs	12.2(33)SRE	This feature enables you to configure QoS policies in ATM PVP mode for L2VPNs. The following commands were introduced or modified by this feature: **cbr**, **match atm-vci**, **service-policy**, **ubr**, **vbr-nrt**, **vbr-rt**.