



QoS Policies for VFI Pseudowires

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Restrictions for QoS Policies for VFI Pseudowires

- A maximum of 32K pseudowires.
- A maximum of 4K unique policy maps.
- A maximum of 128 neighbors per VFI context.

Information About QoS Policies for VFI Pseudowires

QoS Policies for VFI Pseudowires

QoS policies are specified on individual pseudowire interfaces and are applied only to the corresponding pseudowires. It is possible to specify different QoS policies on different pseudowire members of the same virtual forwarding interface (VFI) or on the subset of the pseudowires. There may be one or more pseudowires configured per VFI. Both manually configured and auto discovered pseudowire configurations are supported.

QoS policies are specified using a pseudowire template. The template can be applied on multiple pseudowires of the same, or different, VFIs. All those pseudowires get the same QoS policy applied as specified in the template. For auto-discovered pseudowires, QoS policies can only be specified using a pseudowire template.

The QoS Policies for VFI Pseudowires feature supports both ingress and egress policies and traffic classification can be done based on different match criteria.

How to Configure QoS Policies for VFI Pseudowires

Configuring QoS Policies for Pseudowires

Perform this task to configure QoS policies for pseudowires.

Before you begin

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **policy-map** *policy-map-name*
4. **class** *class-map-name*
5. **priority** *bandwidth-kbps*
6. **exit**
7. **class** *class-map-name*
8. **bandwidth percent** *percentage*
9. **exit**
10. **class** *class-map-name*
11. **police cir** *bps*
12. **exit**
13. **class** *class-map-name*
14. **shape average** *bps*
15. **queue-limit** *queue-limit size* **packets**
16. **random-detect**
17. **exit**
18. **exit**
19. **policy-map** *policy-map-name*
20. **class** *class-map-name*
21. **shape average** *bps*
22. **service-policy** *policy-map*
23. **exit**
24. **exit**
25. **policy-map** *policy-map-name*
26. **class** *class-map-name*
27. **shape average** *bps*
28. **exit**
29. **exit**
30. **policy-map** *policy-map-name*
31. **class** *class-map-name*
32. **shape average** *bps*
33. **exit**
34. **exit**

35. **exit** `policy-map` *policy-map-name*
36. **class** *class-map-name*
37. **shape** `average` *bps*
38. **exit**
39. **exit**
40. **policy-map** *policy-map-name*
41. **class** *class-map-name*
42. **police** *bps*
43. **interface** `pseudowire` *number*
44. **encap** `mpls`
45. **neighbor** *peer-address* *vcid-value*
46. **service-policy** `input` *policy-map-name*
47. **service-policy** `output` *policy-map-name*
48. **interface** `gigabit ethernet` *number*
49. **service-policy** `output` *policy-map-name*

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Note Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	policy-map <i>policy-map-name</i> Example: Device# policy-map gold-policy-child	Creates a policy map to specify a service policy.
Step 4	class <i>class-map-name</i> Example: Device(config-pmap)# class priority-class	Specifies the name of the class map.
Step 5	priority <i>bandwidth-kbps</i> Example: Device(config-pmap-c)# priority 100	Gives priority to a class of traffic belonging to a policy map.
Step 6	exit Example:	Exits policy-map class configuration mode.

	Command or Action	Purpose
	<code>Device(config-pmap-c)# exit</code>	
Step 7	class <i>class-map-name</i> Example: <code>Device(config-pmap-c)# class guarantee-class</code>	Specifies the name of the class map.
Step 8	bandwidth percent <i>percentage</i> Example: <code>Device(config-pmap-c)# bandwidth percent 50</code>	Specifies or modifies the bandwidth allocated for a class belonging to a policy map.
Step 9	exit Example: <code>Device(config-pmap-c)# exit</code>	Exits policy-map class configuration mode.
Step 10	class <i>class-map-name</i> Example: <code>Device(config-pmap-c)# class limited-class</code>	Specifies the name of the class map.
Step 11	police cir <i>bps</i> Example: <code>Device(config-pmap-c)# police cir 8000</code>	Creates a per-interface policer and configures the policy-map class to use it.
Step 12	exit Example: <code>Device(config-pmap-c)# exit</code>	Exits policy-map class configuration mode.
Step 13	class <i>class-map-name</i> Example: <code>Device(config-pmap)# class class-default</code>	Specifies the name of the class map.
Step 14	shape average <i>bps</i> Example: <code>Device(config-pmap-c)# shape average 8000</code>	Shapes traffic to the indicated bit rate.
Step 15	queue-limit <i>queue-limit size</i> packets Example: <code>Device(config-pmap-c)# queue-limit 150 packets</code>	Specifies the queue limit size for a class.

	Command or Action	Purpose
Step 16	random-detect Example: <pre>Device(config-pmap-c)# andom-detect</pre>	Configures Weighted Random Early Detection (WRED) for a class in a policy map.
Step 17	exit Example: <pre>Device(config-pmap-c)# exit</pre>	Exits policy-map class configuration mode.
Step 18	exit Example: <pre>Device(config-pmap)# exit</pre>	Exits policy-map configuration mode.
Step 19	policy-map <i>policy-map-name</i> Example: <pre>Device(config)# policy-map gold-policy-hqos</pre>	Creates a policy map to specify a service policy.
Step 20	class <i>class-map-name</i> Example: <pre>Device(config-pmap)# class class-default</pre>	Specifies the name of the class map.
Step 21	shape <i>average bps</i> Example: <pre>Device(config-pmap-c)# shape average 10000</pre>	Shapes traffic to the indicated bit rate.
Step 22	service-policy <i>policy-map</i> Example: <pre>Device(config-pmap-c)# service-policy gold-policy-child</pre>	Attaches a policy map to a class.
Step 23	exit Example: <pre>Device(config-pmap-c)# exit</pre>	Exits policy-map class configuration mode.
Step 24	exit Example: <pre>Device(config-pmap)# exit</pre>	Exits policy-map configuration mode.

	Command or Action	Purpose
Step 25	policy-map <i>policy-map-name</i> Example: Device(config)# policy-map pw-shaper	Creates a policy map to specify a service policy.
Step 26	class <i>class-map-name</i> Example: Device(config-pmap)#class class-default	Specifies the name of the class map.
Step 27	shape average <i>bps</i> Example: Device(config-pmap-c)#shape average 20000	Shapes traffic to the indicated bit rate.
Step 28	exit Example: Device(config-pmap-c)#exit	Exits policy-map class configuration mode.
Step 29	exit Example: Device(config-pmap)#exit	Exits policy-map configuration mode.
Step 30	policy-map <i>policy-map-name</i> Example: Device(config)# policy-map sub-ifc-shaper	Creates a policy map to specify a service policy.
Step 31	class <i>class-map-name</i> Example: Device(config-pmap)#class class-default	Specifies the name of the class map.
Step 32	shape average <i>bps</i> Example: Device(config-pmap-c)#shape average 40000	Shapes traffic to the indicated bit rate.
Step 33	exit Example: Device(config-pmap-c)#exit	Exits policy-map class configuration mode.
Step 34	exit Example:	Exits policy-map configuration mode.

	Command or Action	Purpose
	<code>Device(config-pmap)#exit</code>	
Step 35	exit policy-map <i>policy-map-name</i> Example: <code>Device(config)# policy-map port-shaper</code>	Creates a policy map to specify a service policy.
Step 36	class <i>class-map-name</i> Example: <code>Device(config-pmap)#class class-default</code>	Specifies the name of the class map.
Step 37	shape average <i>bps</i> Example: <code>Device(config-pmap-c)#shape average 60000</code>	Shapes traffic to the indicated bit rate.
Step 38	exit Example: <code>Device(config-pmap-c)#exit</code>	Exits policy-map class configuration mode.
Step 39	exit Example: <code>Device(config-pmap)#exit</code>	Exits policy-map configuration mode.
Step 40	policy-map <i>policy-map-name</i> Example: <code>Device(config)# policy-map ingress-police</code>	Creates a policy map to specify a service policy.
Step 41	class <i>class-map-name</i> Example: <code>Device(config-pmap)# class class-default</code>	
Step 42	police <i>bps</i> Example: <code>Device(config-pmap-c)# police 10000</code>	Creates a per-interface policer and configures the policy-map class to use it.
Step 43	interface pseudowire <i>number</i> Example: <code>Device(config-pmap-c-police)# interface pseudowire 1</code>	Configures an interface type and enters interface configuration mode.

	Command or Action	Purpose
Step 44	encap mpls Example: Device(config-if)# encap mpls	Configures MPLS encapsulation.
Step 45	neighbor peer-address vcid-value Example: Device(config-if)# neighbor 10.0.0.1 100	Specifies the peer IP address and virtual circuit (VC) ID value of an L2VPN pseudowire.
Step 46	service-policy input policy-map-name Example: Device(config-if)# service-policy input ingress-policy	Attaches a policy map to an input interface.
Step 47	service-policy output policy-map-name Example: Device(config-if)# service-policy output gold-policy-hqos	Attaches a policy map to an output interface.
Step 48	interface gigabit ethernet number Example: Device(config-if)# interface gigabitethernet 1/1/0	Configures an interface type.
Step 49	service-policy output policy-map-name Example: Device(config-if)# service-policy output port-shaper	Attaches a policy map to an output interface.

Creating a Hierarchical Policy for VFI Pseudowires

Perform this task to create a hierarchical policy for VFI Pseudowires.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **policy-map policy-map-name**
4. **class class-map-name**
5. **shape average bps**
6. **service-policy policy-map**
7. **exit**

8. **exit**
9. **policy-map** *policy-map-name*
10. **class** *class-map-name*
11. **shape average** *bps*
12. **exit**
13. **exit**
14. **policy-map** *policy-map-name*
15. **class** *class-map-name*
16. **shape average** *bps*
17. **exit**
18. **exit**
19. **exit policy-map** *policy-map-name*
20. **class** *class-map-name*
21. **shape average** *bps*
22. **exit**
23. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Note Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	policy-map <i>policy-map-name</i> Example: Device(config)# policy-map gold-policy-hqos	Creates a policy map to specify a service policy.
Step 4	class <i>class-map-name</i> Example: Device(config-pmap)# class class-default	Specifies the name of the class map.
Step 5	shape average <i>bps</i> Example: Device(config-pmap-c)# shape average 10000	Shapes traffic to the indicated bit rate.
Step 6	service-policy <i>policy-map</i> Example:	Attaches a policy map to a class.

	Command or Action	Purpose
	Device(config-pmap-c)# service-policy gold-policy-child	
Step 7	exit Example: Device(config-pmap-c)# exit	Exits policy-map class configuration mode.
Step 8	exit Example: Device(config-pmap)# exit	Exits policy-map configuration mode.
Step 9	policy-map <i>policy-map-name</i> Example: Device(config)# policy-map pw-shaper	Creates a policy map to specify a service policy.
Step 10	class <i>class-map-name</i> Example: Device(config-pmap)# class class-default	Specifies the name of the class map.
Step 11	shape average <i>bps</i> Example: Device(config-pmap-c)# shape average 20000	Shapes traffic to the indicated bit rate.
Step 12	exit Example: Device(config-pmap-c)# exit	Exits policy-map class configuration mode.
Step 13	exit Example: Device(config-pmap)# exit	Exits policy-map configuration mode.
Step 14	policy-map <i>policy-map-name</i> Example: Device(config)# policy-map sub-ifc-shaper	Creates a policy map to specify a service policy.
Step 15	class <i>class-map-name</i> Example: Device(config-pmap)# class class-default	Specifies the name of the class map.

	Command or Action	Purpose
Step 16	shape average <i>bps</i> Example: Device(config-pmap-c)# shape average 40000	Shapes traffic to the indicated bit rate.
Step 17	exit Example: Device(config-pmap-c)# exit	Exits policy-map class configuration mode.
Step 18	exit Example: Device(config-pmap)# exit	Exits policy-map configuration mode.
Step 19	exit policy-map <i>policy-map-name</i> Example: Device(config)# policy-map port-shaper	Creates a policy map to specify a service policy.
Step 20	class <i>class-map-name</i> Example: Device(config-pmap)# class class-default	Specifies the name of the class map.
Step 21	shape average <i>bps</i> Example: Device(config-pmap-c)# shape average 60000	Shapes traffic to the indicated bit rate.
Step 22	exit Example: Device(config-pmap-c)# exit	Exits policy-map class configuration mode.
Step 23	exit Example: Device(config-pmap)# exit	Exits policy-map configuration mode.

Attaching a Policy Map to a VFI Pseudowire

Perform this task to attach a policy map to a VFI Pseudowire.

SUMMARY STEPS

1. enable

2. **configure terminal**
3. **policy-map** *policy-map-name*
4. **class** *class-map-name*
5. **police** *bps*
6. **interface pseudowire** *number*
7. **encap mpls**
8. **neighbor** *peer-address vcid-value*
9. **service-policy input** *policy-map-name*
10. **service-policy output** *policy-map-name*
11. **interface gigabit ethernet** *number*
12. **service-policy output** *policy-map-name*
13. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Note Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	policy-map <i>policy-map-name</i> Example: Device# policy-map ingress-police	Creates a policy map to specify a service policy.
Step 4	class <i>class-map-name</i> Example: Device(config-pmap)# class class-default	Specifies the name of the class map.
Step 5	police <i>bps</i> Example: Device(config-pmap-c)# police 10000	Creates a per-interface policer and configures the policy-map class to use it.
Step 6	interface pseudowire <i>number</i> Example: Device(config-pmap-c-police)# interface pseudowire 1	Configures an interface type and enters interface configuration mode.

	Command or Action	Purpose
Step 7	encap mpls Example: Device(config-if)# encap mpls	Configures MPLS encapsulation.
Step 8	neighbor peer-address vcid-value Example: Device(config-if)# neighbor 10.0.0.1 100	Specifies the peer IP address and virtual circuit (VC) ID value of an L2VPN pseudowire.
Step 9	service-policy input policy-map-name Example: Device(config-if)# service-policy input ingress-policy	Attaches a policy map to an input interface.
Step 10	service-policy output policy-map-name Example: Device(config-if)# service-policy output gold-policy-hqos	Attaches a policy map to an output interface.
Step 11	interface gigabit ethernet number Example: Device(config-if)# interface gigabit ethernet 1/1/0	Configures an interface type.
Step 12	service-policy output policy-map-name Example: Device(config-if)# service-policy output port-shaper	Attaches a policy map to an output interface.
Step 13	exit Example: Device(config-if)# exit	Exits interface configuration mode.

Configuring VFI with Two Pseudowire Members with Different QoS Policies

Perform this task to configure VFI with two pseudowire members with different QoS policies.

SUMMARY STEPS

1. **enable**
2. **configure terminal**

3. **interface pseudowire** *number*
4. **encap mpls**
5. **neighbor** *peer-address vcid value*
6. **service-policy output** *policy-map-name*
7. **interface pseudowire** *number*
8. **encap mpls**
9. **neighbor** *peer-address vcid value*
10. **service-policy output** *policy-map-name*
11. **l2vpn vfi context** *name*
12. **vpn id** *vpn-id*
13. **member pseudowire** *pw-int-number*
14. **member pseudowire** *pw-int-number*
15. **bridge-domain** *bridge-domain-id*
16. **member** *interface-type-number*
17. **interface BDI** *number*
18. **ip vrf forwarding** *vrf-name*
19. **ip address** *ip-address mask*

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Device> enable	Enables privileged EXEC mode. Note Enter your password if prompted.
Step 2	configure terminal Example: Device# configure terminal	Enters global configuration mode.
Step 3	interface pseudowire <i>number</i> Example: Device# interface pseudowire 1	Configures an interface type and enters interface configuration mode.
Step 4	encap mpls Example: Device(config-if)# encap mpls	Configures MPLS encapsulation.
Step 5	neighbor <i>peer-address vcid value</i> Example: Device(config-if)# neighbor 10.0.0.1 100	Specifies the peer IP address and virtual circuit (VC) ID value of an L2VPN pseudowire.

	Command or Action	Purpose
Step 6	service-policy output <i>policy-map-name</i> Example: <pre>Device(config-if)# service-policy output gold-policy</pre>	Attaches a policy map to an output interface.
Step 7	interface pseudowire <i>number</i> Example: <pre>Device(config-if)# interface pseudowire 2</pre>	Configures an interface type.
Step 8	encap mpls Example: <pre>Device(config-if)# encap mpls</pre>	Configures MPLS encapsulation.
Step 9	neighbor <i>peer-address vcid value</i> Example: <pre>Device(config-if)# neighbor 20.0.0.1 100</pre>	Specifies the peer IP address and VCID of an L2VPN pseudowire.
Step 10	service-policy output <i>policy-map-name</i> Example: <pre>Device(config-if)# service-policy output silver-policy</pre>	Attaches a policy map to an output interface.
Step 11	l2vpn vfi context <i>name</i> Example: <pre>Device(config-if)# l2vpn vfi context my-vfi</pre>	Establishes a Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) between two or more separate networks.
Step 12	vpn id <i>vpn-id</i> Example: <pre>Device(config-vfi)# vpn id 100</pre>	Sets a VPN ID on a Virtual Private LAN Services (VPLS) instance.
Step 13	member pseudowire <i>pw-int-number</i> Example: <pre>Device(config-vfi)# member pseudowire 1</pre>	Specifies the devices that form a point-to-point Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) connection.
Step 14	member pseudowire <i>pw-int-number</i> Example: <pre>Device(config-vfi)# member pseudowire 2</pre>	Specifies the devices that form a point-to-point Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) connection.

	Command or Action	Purpose
Step 15	bridge-domain <i>bridge-domain-id</i> Example: Device(config-vfi)# bridge-domain 100	Configures components on a bridge domain.
Step 16	member <i>interface-type-number</i> Example: Device(config-bdomain)# member vfi my-vfi	Binds a service instance to a bridge domain instance.
Step 17	interface BDI <i>number</i> Example: Device(config-bdomain)# interface BDI 100	Configures an interface type and enters interface configuration mode.
Step 18	ip vrf forwarding <i>vrf-name</i> Example: Device(config-if)# ip vrf forwarding MY-VRF	Associates a Virtual Private Network (VPN) routing and forwarding (VRF) instance with an interface or subinterface.
Step 19	ip address <i>ip-address mask</i> Example: Device(config-if)# ip address 30.0.0.1 255.255.255.0	Sets a primary or secondary IP address for an interface.

Configuring VFI with Two Pseudowire Members with the Same QoS Policy

Perform this task to configure VFI with two pseudowire members with the same QoS policy.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **template type pseudowire** *name*
4. **encap mpls**
5. **service-policy output** *policy-map-name*
6. **interface pseudowire** *number*
7. **encap mpls**
8. **neighbor** *peer-address vcid value*
9. **source template type pseudowire** *template-name*
10. **interface pseudowire** *number*
11. **encap mpls**
12. **neighbor** *peer-address vcid value*
13. **source template type pseudowire** *template-name*
14. **l2vpn vfi context** *name*
15. **vpn id** *vpn-id*

16. **member pseudowire** *pw-int-number*
17. **member pseudowire** *pw-int-number*
18. **bridge-domain** *bridge-domain-id*
19. **member interface-type-number**
20. **interface BDI** *number*
21. **ip vrf forwarding** *vrf-name*
22. **ip address** *ip-address mask*

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: <pre>Device> enable</pre>	Enables privileged EXEC mode. Note Enter your password if prompted.
Step 2	configure terminal Example: <pre>Device# configure terminal</pre>	Enters global configuration mode.
Step 3	template type pseudowire <i>name</i> Example: <pre>Device(config)# template type pseudowire my_template</pre>	Configures a template.
Step 4	encap mpls Example: <pre>Device(config-if)# encap mpls</pre>	Configures MPLS encapsulation.
Step 5	service-policy output <i>policy-map-name</i> Example: <pre>Device(config-template)# service-policy output common-policy</pre>	Attaches a policy map to a output interface.
Step 6	interface pseudowire <i>number</i> Example: <pre>Device(config-if)# interface pseudowire 1</pre>	Configures an interface type.
Step 7	encap mpls Example: <pre>Device(config-if)# encap mpls</pre>	Configures MPLS encapsulation.

	Command or Action	Purpose
Step 8	neighbor <i>peer-address vcid value</i> Example: Device(config-if)# neighbor 10.0.0.1 100	Specifies the peer IP address and VCID of an L2VPN pseudowire.
Step 9	source template type pseudowire <i>template-name</i> Example: Device(config-if)# source template type pseudowire my_template	Configures the name of a source template of type pseudowire.
Step 10	interface pseudowire <i>number</i> Example: Device(config-if)# interface pseudowire 2	Configures an interface type.
Step 11	encap mpls Example: Device(config-if)# encap mpls	Configures MPLS encapsulation.
Step 12	neighbor <i>peer-address vcid value</i> Example: Device(config-if)# neighbor 20.0.0.1 100	Specifies the peer IP address and VCID of an L2VPN pseudowire.
Step 13	source template type pseudowire <i>template-name</i> Example: Device(config-if)# source template type pseudowire my_template	Configures the name of a source template of type pseudowire.
Step 14	l2vpn vfi context <i>name</i> Example: Device(config-if)# l2vpn vfi context my-vfi	Establishes a Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) between two or more separate networks.
Step 15	vpn id <i>vpn-id</i> Example: Device(config-vfi)# vpn id 100	Sets a VPN ID on a Virtual Private LAN Services (VPLS) instance.
Step 16	member pseudowire <i>pw-int-number</i> Example: Device(config-vfi)# member pseudowire 1	Specifies the devices that form a point-to-point Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) connection.

	Command or Action	Purpose
Step 17	member <i>pseudowire pw-int-number</i> Example: Device(config-vfi)# member pseudowire 2	Specifies the devices that form a point-to-point Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) connection.
Step 18	bridge-domain <i>bridge-domain-id</i> Example: Device(config-vfi)# bridge-domain 100	Configures components on a bridge domain.
Step 19	member <i>interface-type-number</i> Example: Device(config-bdomain)# member vfi my-vfi	Binds a service instance to a bridge domain instance.
Step 20	interface BDI <i>number</i> Example: Device(config-bdomain)# interface BDI 100	Configures an interface type and enters interface configuration mode.
Step 21	ip vrf forwarding <i>vrf-name</i> Example: Device(config-if)# ip vrf forwarding MY-VRF	Associates a Virtual Private Network (VPN) routing and forwarding (VRF) instance with an interface or subinterface.
Step 22	ip address <i>ip-address mask</i> Example: Device(config-if)# ip address 30.0.0.1 255.255.255.0	Sets a primary or secondary IP address for an interface.

Configuring VFI with Auto Discovered Pseudowires

Perform this task to configure VFI with auto discovered pseudowires.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **template type pseudowire** *name*
4. **encap mpls**
5. **service-policy output** *policy-map-name*
6. **l2vpn vfi context** *name*
7. **vpn id** *vpn-id*
8. **autodiscovery bgp signaling ldp template** *template-name*
9. **bridge-domain** *bridge-domain-id*
10. **member** *interface-type-number*

11. `interface BDI number`
12. `ip vrf forwarding vrf-name`
13. `ip address ip-address mask`

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: <pre>Device> enable</pre>	Enables privileged EXEC mode. Note Enter your password if prompted.
Step 2	configure terminal Example: <pre>Device# configure terminal</pre>	Enters global configuration mode.
Step 3	template type pseudowire name Example: <pre>Device(config)# template type pseudowire my_template</pre>	Configures a template.
Step 4	encap mpls Example: <pre>Device(config-if)# encap mpls</pre>	Configures MPLS encapsulation.
Step 5	service-policy output policy-map-name Example: <pre>Device(config-template)# service-policy output common-policy</pre>	Attaches a policy map to a output interface.
Step 6	l2vpn vfi context name Example: <pre>Device(config-if)# l2vpn vfi context my-vfi</pre>	Establishes a Layer 2 VPN (L2VPN) virtual forwarding interface (VFI) between two or more separate networks.
Step 7	vpn id vpn-id Example: <pre>Device(config-vfi)# vpn id 100</pre>	Sets a VPN ID on a Virtual Private LAN Services (VPLS) instance.
Step 8	autodiscovery bgp signaling ldp template template-name Example:	Designates a Layer 2 virtual forwarding interface (VFI) as having Label Distribution Protocol (LDP) autodiscovered pseudowire members.

	Command or Action	Purpose
	Device(config-vfi)# autodiscovery bgp signaling ldp template my_template	
Step 9	bridge-domain <i>bridge-domain-id</i> Example: Device(config-vfi)# bridge-domain 100	Configures components on a bridge domain.
Step 10	member <i>interface-type-number</i> Example: Device(config-bdomain)# member vfi my-vfi	Binds a service instance to a bridge domain instance.
Step 11	interface BDI <i>number</i> Example: Device(config-bdomain)# interface BDI 100	Configures an interface type and enters interface configuration mode.
Step 12	ip vrf forwarding <i>vrf-name</i> Example: Device(config-if)# ip vrf forwarding MY-VRF	Associates a Virtual Private Network (VPN) routing and forwarding (VRF) instance with an interface or subinterface.
Step 13	ip address <i>ip-address mask</i> Example: Device(config-if)# ip address 30.0.0.1 255.255.255.0	Sets a primary or secondary IP address for an interface.

Configuration Examples for QoS Policies for VFI Pseudowires

Example: Configuring QoS Policies for Pseudowires

The following example shows how to QoS policies for pseudowires:

```
Device(config)# policy-map GOLD-POLICY-CHILD
Device(config-pmap)# class PRIORITY-CLASS
Device(config-pmap-c)# priority 100
Device(config-pmap-c)# exit
Device(config-pmap)# class GUARANTEE-CLASS
Device(config-pmap-c)# bandwidth 1000
Device(config-pmap-c)# exit
Device(config-pmap)# class LIMITED-CLASS
Device(config-pmap-c)# police cir 8000
Device(config-pmap-c-police)# class class-default
Device(config-pmap-c)# shape average 8000
Device(config-pmap-c)# queue-limit 150
Device(config-pmap-c)# random-detect
```

Example: Configuring VFI with Two Pseudowire Members with Different QoS Policies

```

Device(config-pmap-c)# exit
Device(config-pmap)# exit
Device(config)# policy-map GOLD-POLICY-HQOS
Device(config-pmap)# class class-default
Device(config-pmap-c)# shape average 8000
Device(config-pmap-c)# service-policy GOLD-POLICY-CHILD
Device(config-pmap-c)# exit
Device(config-pmap)# exit
Device(config)# policy-map PW-SHAPER
Device(config-pmap)# class class-default
Device(config-pmap-c)# shape average 8000
Device(config-pmap-c)# exit
Device(config-pmap)# exit
Device(config)# policy-map SUB-IFC-SHAPER
Device(config-pmap)# class class-default
Device(config-pmap-c)# shape average 10000
Device(config-pmap-c)# exit
Device(config-pmap)# exit
Device(config)# policy-map PORT-SHAPER
Device(config-pmap)# class class-default
Device(config-pmap-c)# shape average 20000
Device(config-pmap-c)# exit
Device(config-pmap)# exit
Device(config)# policy-map INGRESS-POLICE
Device(config-pmap)# class class-default
Device(config-pmap-c)# police 10000
Device(config-pmap-c-police)# interface pseudowire 1
Line protocol on Interface pseudowire0, changed state to up
Device(config-if)# encaps mpls
Device(config-if)# neighbor 10.0.0.1 100
Device(config-if)# service-policy input INGRESS-POLICY
Device(config-if)# service-policy output GOLD-POLICY-HQOS
Device(config-if)# interface GigabitEthernet 1/1/0
--- Pseudowire is going out through this interface
Device(config-if)# service-policy output PORT-SHAPER

```

Example: Configuring VFI with Two Pseudowire Members with Different QoS Policies

The following example shows how to configure VFI with two pseudowire members with different QoS policies:

```

Device(config)# interface pseudowire1
Line protocol on Interface pseudowire0, changed state to up
Device(config-if)# encaps mpls
Device(config-if)# neighbor 10.0.0.1 100
Device(config-if)# service-policy output GOLD-POLICY
Device(config-if)# interface pseudowire2
Device(config-if)# encaps mpls
Device(config-if)# neighbor 20.0.0.1 100
Device(config-if)# service-policy output SILVER-POLICY
Device(config-if)# l2vpn vfi context MY-VFI
Device(config-vfi)# vpn id 100
Device(config-vfi)# member pseudowire1
Device(config-vfi)# member pseudowire2
Device(config-vfi)# bridge-domain 100
Device(config-bdomain)# member vfi MY-VFI

```

```

STATUS_CHANGED: Status of VFI my-vfi changed from DOWN to UP
Device(config-bdomain)# interface BDI 100
Device(config-if)# ip vrf forwarding MY-VRF
Device(config-if)# ip address 30.0.0.1 255.255.255.0

```

Example: Configuring VFI with Two Pseudowire Members with the Same QoS Policy

The following example shows how to configure VFI with two pseudowire members with the same QoS policy:

```

Device(config)# template type pseudowire MY_TEMPLATE
Device(config-template)# encapsulation mpls
Device(config-template)# service-policy output COMMON-POLICY
Device(config-template)# interface pseudowire1
Line protocol on Interface pseudowire0, changed state to up
Device(config-if)# encaps mpls
Device(config-if)# neighbor 10.0.0.1 100
Device(config-if)# source template type pseudowire MY_TEMPLATE
Device(config-if)# interface pseudowire2
Device(config-if)# encaps mpls
Device(config-if)# neighbor 20.0.0.1 100
Device(config-if)# source template type pseudowire MY_TEMPLATE
Device(config-if)# l2vpn vfi context MY-VFI
Device(config-vfi)# vpn id 100
Device(config-vfi)# member pseudowire1
Device(config-vfi)# member pseudowire2
Device(config-vfi)# bridge-domain 100
Device(config-bdomain)# member vfi MY-VFI
Status of VFI my-vfi changed from DOWN to UP
Device(config-bdomain)# interface BDI 100
Device(config-if)# ip vrf forwarding MY-VRF
Device(config-if)# ip address 30.0.0.1 255.255.255.0

```

Example: Configuring VFI with Auto Discovered Pseudowires

The following example shows how to configure VFI with auto discovered pseudowires:

```

Device(config)# template type pseudowire MY_TEMPLATE
Device(config-template)# encapsulation mpls
Device(config-template)# service-policy output COMMON-POLICY
Device(config-template)# l2vpn vfi context MY-VFI
Device(config-vfi)# vpn id 100
Line protocol on Interface pseudowire0, changed state to up
Device(config-vfi)# autodiscovery bgp signaling ldp template MY_TEMPLATE
Device(config-vfi-autodiscovery)# bridge-domain 100
Device(config-bdomain)# member vfi MY-VFI
Status of VFI my-vfi changed from DOWN to UP
Device(config-bdomain)# interface BDI 100
Device(config-if)# ip vrf forwarding MY-VRF
Device(config-if)# ip address 30.0.0.1 255.255.255.0

```

Example: Displaying Pseudowire Policy Map Information

The following is sample output from the **show policy-map interface** command which shows class maps and policy maps configured for the pseudowire 2 interface:

```
Device#show policy-map interface pseudowire2
pseudowire2

Service-policy output: pw_brr

Class-map: prec1 (match-all)
  0 packets, 0 bytes
  30 second offered rate 0000 bps, drop rate 0000 bps
  Match: ip precedence 1
  Queueing
    queue limit 4166 packets
    (queue depth/total drops/no-buffer drops) 0/0/0
    (pkts output/bytes output) 0/0
    bandwidth remaining ratio 1

Class-map: prec2 (match-all)
  0 packets, 0 bytes
  30 second offered rate 0000 bps, drop rate 0000 bps
  Match: ip precedence 2
  Queueing
    queue limit 4166 packets
    (queue depth/total drops/no-buffer drops) 0/0/0
    (pkts output/bytes output) 0/0
    bandwidth remaining ratio 2

Class-map: prec3 (match-all)
  0 packets, 0 bytes
  30 second offered rate 0000 bps, drop rate 0000 bps
  Match: ip precedence 3
  Queueing
    queue limit 4166 packets
    (queue depth/total drops/no-buffer drops) 0/0/0
    (pkts output/bytes output) 0/0
    bandwidth remaining ratio 3

Class-map: class-default (match-any)
  0 packets, 0 bytes
  30 second offered rate 0000 bps, drop rate 0000 bps
  Match: any
  Queueing
    queue limit 4166 packets
    (queue depth/total drops/no-buffer drops) 0/0/0
    (pkts output/bytes output) 0/0
    bandwidth remaining ratio 4
Device#
```

Additional References for QoS Policies for VFI Pseudowires

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases

Related Topic	Document Title
MPLS commands	<i>Cisco IOS Multiprotocol Label Switching Command Reference</i>
QoS commands	<i>Cisco IOS Quality of Service Solutions Command Reference</i>
Configuring the pseudowire class	“Any Transport over MPLS”
Layer 2 VPN	<ul style="list-style-type: none"> • Any Transport over MPLS • L2VPN Pseudowire Switching • MPLS LSP Ping/Traceroute for LDP/TE, and LSP Ping for VCCV
L2VPN pseudowires	<ul style="list-style-type: none"> • L2VPN Pseudowire Redundancy • MPLS Pseudowire Status Signaling

Technical Assistance

Description	Link
The Cisco Support and Documentation website provides online resources to download documentation, software, and tools. Use these resources to install and configure the software and to troubleshoot and resolve technical issues with Cisco products and technologies. Access to most tools on the Cisco Support and Documentation website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html

Feature Information For QoS Policies for VFI Pseudowires

Table 1: Feature Information for QoS Policies for VFI Pseudowire

Feature Name	Releases	Feature Information
QoS Policies for VFI Pseudowires	Cisco IOS XE 3.8S	<p>This features allows you to configure QoS classes and policies for use on VFI pseudowire members.</p> <p>The following commands were introduced or modified: show policy-map interface.</p>

