# VPLS Autodiscovery: BGP Based

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VPLS Autodiscovery enables each Virtual Private LAN Service (VPLS) provider edge (PE) router to discover which other PE routers are part of the same VPLS domain. VPLS Autodiscovery also automatically detects when PE routers are added to or removed from the VPLS domain. You no longer need to manually configure the VPLS and maintain the configuration when a PE router is added or deleted. VPLS Autodiscovery uses the Border Gateway Protocol (BGP) to discover the VPLS members and to set up and tear down pseudowires in the VPLS.

## 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 VPLS Autodiscovery: BGP Based" section on page 16.

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 VPLS Autodiscovery: BGP Based

Before configuring VPLS Autodiscovery, if you are using a Cisco 7600 series router, perform the Cisco 7600 router-specific tasks listed in the section called "Virtual Private LAN Services on the Optical Service Modules" in the *Cisco 7600 Series Router IOS Software Configuration Guide, 12.2SR*.

# Restrictions for VPLS Autodiscovery: BGP Based

- VPLS Autodiscovery supports only IPV4 addresses.
- VPLS Autodiscovery uses Forwarding Equivalence Class (FEC) 129 to convey endpoint information. Manually configured pseudowires use FEC 128.
- VPLS Autodiscovery is not supported with Layer 2 Tunnel Protocol Version 3 (L2TPv3).
- VPLS Autodisocovery is not supported with interautonomous system configurations.
- You can configure both autodiscovered and manually configured pseudowires in a single virtual forwarding instance (VFI). However, the pseudowires cannot go to the same peer PE router.
- If you manually configure a neighbor using the **neighbor (VPLS)** command after you have enabled VPLS Autodiscovery and both peers are in autodiscovery mode, manually configure the route target (RT) values to prevent each peer from receiving discovery data for that VPLS.
- If you manually configure multiple pseudowires and target different IP addresses on the same PE router for each pseudowire, do not use the same virtual circuit identifier (VC ID) to identify the pseudowires terminated at the same PE router.
- You cannot configure a pseudowire by manually configuring a neighbor on one PE router and using autodiscovery on the other PE router to configure the same pseudowire in the other direction.
- Tunnel selection is not supported with autodiscovered neighbors.
- You can have up to 16 route targets only per VFI.
- The same RT is not allowed in multiple VFIs in the same PE router.
- The BGP autodiscovery process does not support dynamic hierarchical VPLS. User-facing PE (U-PE) routers cannot discover the network-facing PE (N-PE) routers, and N-PE routers cannot discover U-PE routers.
- Pseudowires for autodiscovered neighbors are provisioned with split horizon enabled. Therefore, manually configure the pseudowires for hierarchical VPLS. Make sure the U-PE routers do not participate in BGP autodiscovery for those pseudowires.
- Do not disable split horizon on autodiscovered neighbors. Split horizon is required with VPLS Autodiscovery.
- The provisioned peer address must be a /32 address bound to the peer's Label Distribution Protocol (LDP) router ID.
- The peer PE router must be able to access the IP address that is used as the local LDP router ID. Even though the IP address need not be used in the **xconnect** command on the peer PE router, that IP address must be reachable.
- VPLS Autodiscovery is supported on the Cisco 7600 router hardware. For details on supported shared port adapters and line cards, see the following documents:
  - *Cisco 7600 Series Router Cisco IOS Software Configuration Guide*
  - *Release Notes for Cisco IOS Release 12.2SR for the Cisco 7600 Series Routers*

# Information About VPLS Autodiscovery: BGP Based

To understand VPLS Autodiscovery, you should understand the following concepts:



## How the VPLS Feature Works

VPLS allows Multiprotocol Label Switching (MPLS) networks to provide multipoint Ethernet LAN services, also known as Transparent LAN Services (TLS). All customer sites in a VPLS appear to be on the same LAN, even though those sites might be in different geographic locations.

## How the VPLS Autodiscovery: BGP Based Feature Works

VPLS Autodiscovery enables each VPLS PE router to discover the other PE routers that are part of the same VPLS domain. VPLS Autodiscovery also tracks when PE routers are added to or removed from the VPLS domain. The autodiscovery and signaling functions use BGP to find and track the PE routers.

BGP uses the L2VPN Routing Information Base (RIB) to store endpoint provisioning information, which is updated each time any Layer 2 VFI is configured. Prefix and path information is stored in the L2VPN database, allowing BGP to make decisions on the best path. When BGP distributes the endpoint provisioning information in an update message to all its BGP neighbors, the endpoint information is used to configure a pseudowire mesh to support L2VPN-based services.

The BGP autodiscovery mechanism facilitates the configuration of L2VPN services, which are an integral part of the Cisco IOS Virtual Private LAN Service (VPLS) feature. VPLS enables flexibility in deploying services by connecting geographically dispersed sites as a large LAN over high-speed Ethernet in a robust and scalable IP MPLS network. For more information about BGP and the L2VPN address family in relation to VPLS Autodiscovery, see the following documents:

- The section called “L2VPN Address Family” in the *Cisco BGP Overview*.
- The document called *BGP Support for the L2VPN Address Family*

## How Enabling VPLS Autodiscovery Differs from Manually Configuring VPLS

With VPLS Autodiscovery, you no longer need to manually set up the VPLS. The commands you use to set up VPLS Autodiscovery are similar to those you use to manually configure a VPLS, as shown in Table 1. VPLS Autodiscovery uses **neighbor** commands in L2VPN address family mode to distribute endpoint information to configure a pseudowire.

*Table 1 VPLS Autodiscovery Configuration versus Manual VPLS Configuration*

| Manual Configuration of VPLS | VPLS Autodiscovery: BGP Based |
|---|---|
| l2 vfi vpls1 manual<br> vpn id 100<br> neighbor 10.10.10.1 encapsulation mpls<br> neighbor 10.10.10.0 encapsulation mpls<br> exit | l2 vfi vpls1 autodiscovery<br> vpn id 100<br> exit<br><br>router bgp 1<br> no bgp default ipv4-unicast<br> bgp log-neighbor-changes<br> bgp update-delay 1<br> neighbor 10.1.1.2 remote-as 1<br> neighbor 10.1.1.2 update-source Loopback1<br>.<br>.<br>.<br> address-family l2vpn vpls<br> neighbor 10.1.1.2 activate<br> neighbor 10.1.1.2 send-community extended<br>exit-address-family |

When you configure VPLS Autodiscovery, you enter the **l2vfi autodiscovery** command. This command allows the VFI to learn and advertise the pseudowire endpoints. As a result, you no longer need to enter the **neighbor (VPLS)** command in L2 VFI configuration mode.

However, the **neighbor (VPLS)** command is still supported with VPLS Autodiscovery in L2 VFI command mode. You can use the **neighbor (VPLS)** command to allow PE routers that do not participate in the autodiscovery process to join the VPLS. You can also use the **neighbor (VPLS)** command with PE routers that have been configured using the Tunnel Selection feature. You can also use the **neighbor (VPLS)** command in hierarchical VPLS configurations that have U-PE routers that do not participate in the autodiscovery process and have split-horizon forwarding disabled.

# Show Commands Affected by VPLS Autodiscovery: BGP Based

VPLS Autodiscovery changes the following show commands:

- The **show mpls l2transport vc** command with the **detail** keyword has been updated to include FEC 129 signaling information for the autodiscovered VPLS pseudowires.
- The **show vfi** command now displays information related to autodiscovered VFIs. The new information includes the VPLS ID, the route distinguisher (RD), the RT, and the router IDs of the discovered peers.
- The **show xconnect** command has been updated with the **rib** keyword to provide RIB information about the pseudowires.

# BGP VPLS Autodiscovery Support on a Route Reflector

VPLS Autodiscovery is normally run on PE routers to support endpoint discovery and the setup of pseudowires between the PEs (typically a full mesh). VPLS does not normally run on a BGP route reflector. In Cisco IOS Release 12.2(33)SRE, VPLS Autodiscovery support was added to route reflectors. The BGP route reflector can be used to reflect the BGP VPLS prefixes without having VPLS explicitly configured on the route reflector.

The route reflector does not participate in the autodiscovery, meaning that no pseudowires are set up between the route reflector and the PEs. The route reflector reflects the VPLS prefixes to other PEs, so that the PEs do not need to have a full mesh of BGP sessions. The network administrator configures only the BGP VPLS address family on the route reflector. For an example configuration of VPLS autodiscovery support on a route reflector, see the "BGP VPLS Autodiscovery Support on Route Reflector: Example" section on page 13.

# How to Configure VPLS Autodiscovery: BGP Based

To configure VPLS Autodiscovery, perform the following tasks:

- Enabling VPLS Autodiscovery: BGP Based, page 5 (required)
- Configuring BGP to Enable VPLS Autodiscovery, page 6 (required)
- Customizing the VPLS Autodiscovery Settings, page 9 (optional)

## Enabling VPLS Autodiscovery: BGP Based

Perform the following task to enable each VPLS PE router to discover the other PE routers that are part of the same VPLS domain.

### Prerequisites

Before configuring VPLS Autodiscovery, perform the Cisco 7600 router-specific tasks listed in the "Virtual Private LAN Services on the Optical Services Modules" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide*, Release 12.2SR.

#### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **l2 vfi** *vfi-name* **autodiscovery**
4. **vpn id** *vpn-id*
5. **exit**

#### DETAILED STEPS

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | `enable`<br><br>**Example:**<br>`Router> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | `configure terminal`<br><br>**Example:**<br>`Router# configure terminal` | Enters global configuration mode. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 3** | **l2 vfi** *vfi-name* **autodiscovery**<br><br>**Example:**<br>`Router(config)# l2 vfi vpls1 autodiscovery` | Enables VPLS Autodiscovery on the PE router and enters L2 VFI configuration mode. |
| **Step 4** | **vpn id** *vpn-id*<br><br>**Example:**<br>`Router(config-vfi)# vpn id 10` | Configures a VPN ID for the VPLS domain. |
| **Step 5** | **exit**<br><br>**Example:**<br>`Router(config-vfi)# exit` | Exits L2 VFI configuration mode. Commands take effect after the router exits L2 VFI configuration mode. |

# Configuring BGP to Enable VPLS Autodiscovery

In Cisco IOS Release 12.2(33)SRB, the BGP L2VPN address family was introduced with a separate L2VPN RIB that contains endpoint provisioning information for VPLS Autodiscovery. BGP learns the endpoint provisioning information from the L2VPN database which is updated each time a Layer 2 virtual forwarding instance (VFI) is configured. When BGP distributes the endpoint provisioning information in an update message to all its BGP neighbors, the endpoint information is used to configure a pseudowire mesh to support aL2VPN-based services.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *autonomous-system-number*
4. **no bgp default ipv4-unicast**
5. **bgp log-neighbor-changes**
6. **neighbor** {*ip-address* | *peer-group-name*} **remote-as** *autonomous-system-number*
7. **neighbor** {*ip-address* | *peer-group-name*} **update-source** *interface*
8. Repeat Step 6 and Step 7 to configure other BGP neighbors.
9. **address-family l2vpn** [**vpls**]
10. **neighbor** {*ip-address* | *peer-group-name*} **activate**
11. **neighbor** {*ip-address* | *peer-group-name*} **send-community** [**both** | **standard** | **extended**]
12. Repeat Step 10 and Step 11 to activate other BGP neighbors under L2VPN address family.
13. **exit-address-family**
14. **exit**
15. **exit**
16. **show vfi**
17. **show ip bgp l2vpn vpls** {**all** | **rd** *vpn-rd*}

## DETAILED STEPS

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **enable**<br><br>**Example:**<br>`Router> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | **configure terminal**<br><br>**Example:**<br>`Router# configure terminal` | Enters global configuration mode. |
| **Step 3** | **router bgp** *autonomous-system-number*<br><br>**Example:**<br>`Router(config)# router bgp 65000` | Enters router configuration mode for the specified routing process. |
| **Step 4** | **no bgp default ipv4-unicast**<br><br>**Example:**<br>`Router(config-router)# no bgp default ipv4-unicast` | Disables the IPv4 unicast address family for the BGP routing process.<br>**Note** Routing information for the IPv4 unicast address family is advertised by default for each BGP routing session configured with the **neighbor remote-as** router configuration command unless you configure the **no bgp default ipv4-unicast** router configuration command before configuring the **neighbor remote-as** command. Existing neighbor configurations are not affected. |
| **Step 5** | **bgp log-neighbor-changes**<br><br>**Example:**<br>`Router(config-router)# bgp log-neighbor-changes` | Enables logging of BGP neighbor resets. |
| **Step 6** | **neighbor** {*ip-address* \| *peer-group-name*} **remote-as** *autonomous-system-number*<br><br>**Example:**<br>`Router(config-router)# neighbor 10.10.10.1 remote-as 65000` | Adds the IP address or peer group name of the neighbor in the specified autonomous system to the IPv4 multiprotocol BGP neighbor table of the local router.<br>• If the *autonomous-system-number* argument matches the autonomous system number specified in the **router bgp** command, the neighbor is an internal neighbor.<br>• If the *autonomous-system-number* argument does not match the autonomous system number specified in the **router bgp** command, the neighbor is an external neighbor.<br>• In this example, the neighbor at 10.10.10.1 is an internal BGP neighbor. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 7** | **neighbor** {*ip-address* \| *peer-group-name*} **update-source** *interface-type interface-number*<br><br>**Example:**<br>`Router(config-router)# neighbor 10.10.10.1 update-source loopback1` | (Optional) Configures a router to select a specific source or interface to receive routing table updates.<br>• This example uses a loopback interface. The advantage to this configuration is that the loopback interface is not affected by the effects of a flapping interface. |
| **Step 8** | Repeat Step 6 and Step 7 to configure other BGP neighbors | — |
| **Step 9** | **address-family l2vpn** [**vpls**]<br><br>**Example:**<br>`Router(config-router)# address-family l2vpn vpls` | Specifies the L2VPN address family and enters address family configuration mode.<br>• The optional **vpls** keyword specifies that VPLS endpoint provisioning information is to be distributed to BGP peers.<br>• In this example, an L2VPN VPLS address family session is created. |
| **Step 10** | **neighbor** {*ip-address* \| *peer-group-name*} **activate**<br><br>**Example:**<br>`Router(config-router-af)# neighbor 10.10.10.1 activate` | Enables the neighbor to exchange information for the L2VPN VPLS address family with the local router. |
| **Step 11** | **neighbor** {*ip-address* \| *peer-group-name*} **send-community** {**both** \| **standard** \| **extended**}<br><br>**Example:**<br>`Router(config-router-af)# neighbor 10.10.10.1 send-community extended` | Specifies that a communities attribute should be sent to a BGP neighbor.<br>• In this example, an extended communities attribute is sent to the neighbor at 10.10.10.1. |
| **Step 12** | Repeat Step 10 and Step 11 to activate other BGP neighbors under an L2VPN address family. | — |
| **Step 13** | **exit-address-family**<br><br>**Example:**<br>`Router(config-router-af)# exit-address-family` | Exits address family configuration mode and returns to router configuration mode. |
| **Step 14** | **exit**<br><br>**Example:**<br>`Router(config-router)# exit` | Exits router configuration mode. |
| **Step 15** | **exit**<br><br>**Example:**<br>`Router(config)# exit` | Exits privileged EXEC mode. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 16** | **show vfi**<br><br>**Example:**<br>`Router# show vfi` | (Optional) Displays information about the configured VFI instances. |
| **Step 17** | **show ip bgp l2vpn vpls** {**all** \| **rd** *vpn-rd*}<br><br>**Example:**<br>`Router# show ip bgp l2vpn vpls all` | (Optional) Displays information about the Layer2 VPN VPLS address family. |

# Customizing the VPLS Autodiscovery Settings

Several commands allow you to customize the VPLS environment. You can specify identifiers for the VPLS domain, the route distinguisher, the route target, and the PE router. Perform the following steps to customize these settings.

## SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **l2 vfi** *vfi-name* **autodiscovery**
4. **vpn id** *vpn-id*
5. **vpls-id** {*autonomous-system-number*:*nn* | *ip-address*:*nn*}
6. **rd** {*autonomous-system-number*:*nn* | *ip-address*:*nn*}
7. **route-target** [**import** | **export** | **both**] {*autonomous-system-number*:*nn*| *ip-address*:*nn*}
8. **l2 router-id** *ip-address*
9. **exit**

## DETAILED STEPS

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **enable**<br><br>**Example:**<br>`Router> enable` | Enables privileged EXEC mode.<br>• Enter your password if prompted. |
| **Step 2** | **configure terminal**<br><br>**Example:**<br>`Router# configure terminal` | Enters global configuration mode. |
| **Step 3** | **l2 vfi** *vfi-name* **autodiscovery**<br><br>**Example:**<br>`Router(config)# l2 vfi vpls1 autodiscovery` | Enables VPLS Autodiscovery on the PE router and enters L2 VFI configuration mode. |

| | Command or Action | Purpose |
|---|---|---|
| **Step 4** | **vpn id** *vpn-id*<br><br>**Example:**<br>`Router(config-vfi)# vpn id 10` | Configures a VPN ID for the VPLS domain. |
| **Step 5** | **vpls-id** {*autonomous-system-number*:*nn* \| *ip-address*:*nn*}<br><br>**Example:**<br>`Router(config-vfi)# vpls-id 5:300` | (Optional) Specifies the VPLS domain. This command is optional, because VPLS Autodiscovery automatically generates a VPLS ID using the BGP autonomous system number and the configured VFI VPN ID. You can use this command to change the automatically generated VPLS ID.<br><br>There are two formats for configuring the VPLS ID argument. It can be configured in the *autonomous-system-number:network number* (*ASN:nn*) format, as shown in the example, or it can be configured in the *IP-address:network number* format (*IP-address:nn)*. |
| **Step 6** | **rd** {*autonomous-system-number*:*nn* \| *ip-address*:*nn*}<br><br>**Example:**<br>`Router(config-vfi)# rd 2:3` | (Optional) Specifies the RD to distribute endpoint information. This command is optional, because VPLS Autodiscovery automatically generates an RD using the BGP autonomous system number and the configured VFI VPN ID. You can use this command to change the automatically generated route distinguisher.<br><br>There are two formats for configuring the route distinguisher argument.It can be configured in the *autonomous-system-number:network number* (*ASN:nn*) format, as shown in the example, or it can be configured in the *IP-address:network number* format (*IP-address:nn)*. |
| **Step 7** | **route-target** [**import** \| **export** \| **both**] {*autonomous-system-number*:*nn* \| *ip-address*:*nn*}<br><br>**Example:**<br>`Router(config-vfi)# route-target 600:2222` | (Optional) Specifies the route target (RT). This command is optional, because VPLS Autodiscovery automatically generates a route target using the lower 6 bytes of the RD and VPLS ID. You can use this command to change the automatically generated route target.<br><br>There are two formats for configuring the route target argument. It can be configured in the *autonomous-system-number:network number* (*ASN:nn*) format, as shown in the example, or it can be configured in the *IP-address:network number* format (*IP-address:nn)*. |
| **Step 8** | **l2 router-id** *ip-address*<br><br>**Example:**<br>`Router(config-vfi)# l2 router-id 10.10.10.10` | (Optional) Specifies a unique identifier for the PE router. This command is optional, because VPLS Autodiscovery automatically generates a Layer 2 router ID using the MPLS global router ID. You can use this command to change the automatically generated ID. |
| **Step 9** | **exit**<br><br>**Example:**<br>`Router(config-vfi)# exit` | Exits L2 VFI configuration mode. Commands take effect after the router exits L2 VFI configuration mode. |

# Configuration Examples for VPLS Autodiscovery: BGP Based

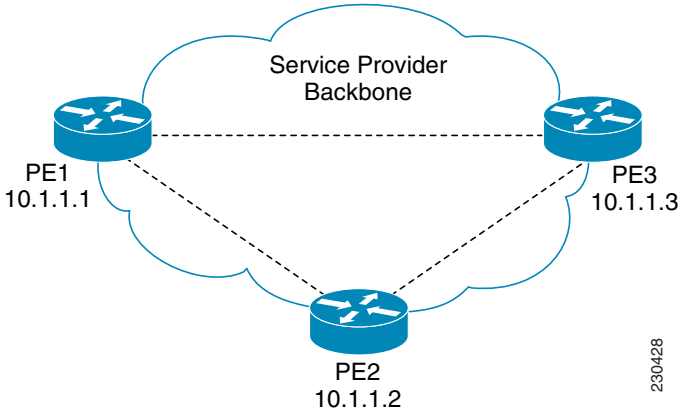
The following examples shows the configuration of a network using VPLS Autodiscovery and VPLS Autodiscovery supported on a route reflector:



## VPLS Autodiscovery: BGP Based: Basic Example

Figure 1 show a basic configuration of VPLS Autodiscovery.

***Figure 1 Basic VPLS Autodiscovery Configuration***




**PE1**

```
l2 router-id 10.1.1.1
l2 vfi auto autodiscovery
 vpn id 100
!
pseudowire-class mpls
 encapsulation mpls
!
interface Loopback1
 ip address 10.1.1.1 255.255.255.255
!
interface Ethernet0/0
 description Backbone interface
 ip address 192.168.0.1 255.255.255.0
 mpls ip
!
router ospf 1
 log-adjacency-changes
 network 10.1.1.0 0.0.0.255 area 0
 network 172.16.0.0 0.0.0.255 area 0
!
router bgp 1
 no bgp default ipv4-unicast
 bgp log-neighbor-changes
 bgp update-delay 1
```

```
 neighbor 10.1.1.2 remote-as 1
 neighbor 10.1.1.2 update-source Loopback1
 neighbor 10.1.1.3 remote-as 1
 neighbor 10.1.1.3 update-source Loopback1
!
 address-family ipv4
 no synchronization
 no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
 neighbor 10.1.1.2 activate
 neighbor 10.1.1.2 send-community extended
 neighbor 10.1.1.3 activate
 neighbor 10.1.1.3 send-community extended
 exit-address-family
```

### PE2

```
l2 router-id 10.1.1.2
l2 vfi auto autodiscovery
 vpn id 100
!
 pseudowire-class mpls
 encapsulation mpls
!
interface Loopback1
 ip address 10.1.1.2 255.255.255.255
!
interface Ethernet0/0
 description Backbone interface
 ip address 192.168.0.2 255.255.255.0
 mpls ip
!
router ospf 1
 log-adjacency-changes
 network 10.1.1.0 0.0.0.255 area 0
 network 172.16.0.0 0.0.0.255 area 0
!
router bgp 1
 no bgp default ipv4-unicast
 bgp log-neighbor-changes
 bgp update-delay 1
 neighbor 10.1.1.1 remote-as 1
 neighbor 10.1.1.1 update-source Loopback1
 neighbor 10.1.1.3 remote-as 1
 neighbor 10.1.1.3 update-source Loopback1
!
 address-family ipv4
 no synchronization
 no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
 neighbor 10.1.1.1 activate
 neighbor 10.1.1.1 send-community extended
 neighbor 10.1.1.3 activate
 neighbor 10.1.1.3 send-community extended
 exit-address-family
```

**PE3**

```
l2 router-id 10.1.1.3
l2 vfi auto autodiscovery
 vpn id 100
!
pseudowire-class mpls
 encapsulation mpls
!
interface Loopback1
 ip address 10.1.1.3 255.255.255.255
!
interface Ethernet0/0
 description Backbone interface
 ip address 192.168.0.3 255.255.255.0
 mpls ip
!
router ospf 1
 log-adjacency-changes
 network 10.1.1.0 0.0.0.255 area 0
 network 172.16.0.0 0.0.0.255 area 0
!
router bgp 1
 no bgp default ipv4-unicast
 bgp log-neighbor-changes
 bgp update-delay 1
 neighbor 10.1.1.1 remote-as 1
 neighbor 10.1.1.1 update-source Loopback1
 neighbor 10.1.1.2 remote-as 1
 neighbor 10.1.1.2 update-source Loopback1
!
 address-family ipv4
 no synchronization
 no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
 neighbor 10.1.1.1 activate
 neighbor 10.1.1.1 send-community extended
 neighbor 10.1.1.2 activate
 neighbor 10.1.1.2 send-community extended
 exit-address-family
```

# BGP VPLS Autodiscovery Support on Route Reflector: Example

In the following example, a host named PE-RR (indicating Provider Edge-Route Reflector) is configured as a route reflector capable of reflecting VPLS prefixes. The VPLS address family is configured by **address-family l2vpn vpls** below.

```
hostname PE-RR
!
router bgp 1
 bgp router-id 1.1.1.3
 no bgp default route-target filter
 bgp log-neighbor-changes
neighbor iBGP_PEERS peer-group
neighbor iBGP_PEERS remote-as 1
neighbor iBGP_PEERS update-source Loopback1
neighbor 1.1.1.1 peer-group iBGP_PEERS
neighbor 1.1.1.2 peer-group iBGP_PEERS
!
```

```
address-family l2vpn vpls
  neighbor iBGP_PEERS send-community extended
  neighbor iBGP_PEERS route-reflector-client
  neighbor 1.1.1.1 peer-group iBGP_PEERS
  neighbor 1.1.1.2 peer-group iBGP_PEERS
exit-address-family
```

# Additional References

The following sections provide references related to the VPLS Autodiscovery: BGP Based feature.

## Related Documents

| Related Topic | Document Title |
|---|---|
| Virtual Private LAN Services on the Cisco 7600 series router | "Virtual Private LAN Services on the Optical Services Modules" chapter in the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide*, Release 12.2SR |
| L2 VPNs on the Cisco 7600 router | Configuration information for Layer 2 VPNs on the Cisco 7600 router is included in the following documents:<br>• The "Configuring PFC3BXL and PFC3B Mode Multiprotocol Label Switching" module of the *Cisco 7600 Series Cisco IOS Software Configuration Guide*, Release 12.2SR<br>• The "Configuring Multiprotocol Label Switching on the Optical Services Modules" module of the *OSM Configuration Note*, Release 12.2SR<br>• The "Configuring Multiprotocol Label Switching on FlexWAN and Enhanced FlexWAN Modules" module of the *FlexWAN and Enhanced FlexWAN Modules Configuration Guide*<br>• The "Configuring Any Transport over MPLS on a SIP" section of the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*<br>• The "Configuring AToM VP Cell Mode Relay Support" section of the *Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide*<br>• The *Release Notes for Cisco IOS Release 12.2SR for the Cisco 7600 Series Routers* |
| MPLS Commands | *Cisco IOS Multiprotocol Label Switching Command Reference*<br>http://www.cisco.com/en/US/docs/ios/mpls/command/reference/mp_book.html |

## Standards

| Standard | Title |
|---|---|
| draft-ietf-l2vpn-signaling-08.txt | *Provisioning, Autodiscovery, and Signaling in L2VPNs* |
| draft-ietf-l2vpn-vpls-bgp-08.8 | *Virtual Private LAN Service (VPLS) Using BGP for Autodiscovery and Signaling* |
| draft-ietf-mpls-lsp-ping-03.txt | *Detecting MPLS Data Plane Failures* |
| draft-ietf-pwe3-vccv-01.txt | *Pseudo-Wire (PW) Virtual Circuit Connection Verification (VCCV)* |

# MIBs

| MIB | MIBs Link |
|---|---|
| • CISCO-IETF-PW-MIB (PW-MIB)<br>• CISCO-IETF-PW-MPLS-MIB (PW-MPLS-MIB)<br>• CISCO-IETF-PW-ENET-MIB (PW-ENET-MIB)<br>• CISCO-IETF-PW-FR-MIB (PW-FR-MIB)<br>• CISCO-IETF-PW-ATM-MIB (PW-ATM-MIB) | To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:<br>http://www.cisco.com/go/mibs |

# RFCs

| RFC | Title |
|---|---|
| RFC 3916 | *Requirements for Pseudo-wire Emulation Edge-to-Edge (PWE3)* |
| RFC 3981 | *Pseudo Wire Emulation Edge-to-Edge Architecture* |

# 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. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password. If you have a valid service contract but do not have a user ID or password, you can register on Cisco.com. | http://www.cisco.com/techsupport |

# Feature Information for VPLS Autodiscovery: BGP Based

Table 2 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.

Cisco IOS software images are specific to a Cisco IOS software release, a feature set, and a platform. Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

**Note** Table 2 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 2 Feature Information for VPLS Autodiscovery: BGP Based*

| Feature Name | Releases | Feature Information |
|---|---|---|
| VPLS Autodiscovery: BGP Based | 12.2(33)SRB | VPLS Autodiscovery enables each Virtual Private LAN Service (VPLS) provider edge (PE) router to discover which other PE routers are part of the same VPLS domain.<br>In 12.2(33)SRB, this feature was introduced on the Cisco 7600 router.<br>The following commands were introduced or modified for this feature:<br>• **auto-route-target**<br>• **l2 router-id**<br>• **l2 vfi autodiscovery**<br>• **neighbor (VPLS)**<br>• **rd (VPLS)**<br>• **route-target (VPLS)**<br>• **show mpls l2transport vc**<br>• **show vfi**<br>• **show xconnect**<br>• **vpls-id**<br>• **xconnect** |
| BGP VPLS Autodiscovery Support on Route Reflector | 12.2(33)SRE | This feature was introduced on the Cisco 7600 series routers. This feature is documented in the following sections:<br>• BGP VPLS Autodiscovery Support on a Route Reflector, page 4<br>• BGP VPLS Autodiscovery Support on Route Reflector: Example, page 13 |