

L2VPN VPLS Inter-AS Option B

The L2VPN VPLS Inter-AS Option B feature expands the existing features of VPLS autodiscovery to operate across multiple Border Gateway Protocol (BGP) autonomous systems. Using BGP-based autodiscovery as the underlying framework, the L2VPN VPLS Inter-AS Option B feature creates a dynamic multisegmented pseudowire (PW) configuration between neighboring Autonomous System Boundary Routers (ASBRs.)

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Prerequisites for L2VPN VPLS Inter-AS Option B

The L2VPN VPLS Inter-AS Option B feature extends the functionality of the VPLS Autodiscovery: BGP Based feature. For example, as a result of L2VPN VPLS Inter-AS Option B feature, stateful switchover (SSO) and nonstop forwarding (NSF) are supported in a standard VPLS Autodiscovery configuration.

Before you configure the L2VPN VPLS Inter-AS Option B feature, enable the VPLS Autodiscovery: BGP Based feature.

For more information about the VPLS Autodiscovery: BGP Based feature, see the “VPLS Autodiscovery: BGP” module.

Restrictions for L2VPN VPLS Inter-AS Option B

Introduced in Cisco IOS Release 15.1(1)S, the L2VPN VPLS Inter-AS Option B feature is supported only on a Cisco 7600 series router that is equipped with a line card capable of running Virtual Private LAN Switching (VPLS).

Information About L2VPN VPLS Inter-AS Option B

VPLS Functionality and L2VPN VPLS Inter-AS Option B

VPLS is a multipoint Layer 2 VPN (L2VPN) that connects two or more customer devices using Ethernet over Multiprotocol Label Switching (EoMPLS) bridging techniques.

VPLS Inter-AS support exists in a number of variations or options (for example, Option A, B, C, and D). The L2VPN VPLS Inter-AS Option B feature supports Option B only and is in compliance with RFC 4364, BGP/MPLS IP Virtual Private Networks (VPNs) .

For more information about VPLS, see the "VPLS Overview" section in the Configuring Multiprotocol Label Switching on the Optical Services Modules document.

L2VPN VPLS Inter-AS Option B Description

The L2VPN VPLS Inter-AS Option B feature extends VPLS across multiple autonomous system boundaries by dynamically creating multisegment pseudowires across the ASBRs.

When a router with external BGP (eBGP) advertises routes to its BGP neighbors, the router uses the source IP address as the next hop of the advertised routes.

When a router with internal BGP (iBGP) advertises routes to its BGP neighbors, the router does not change the next hop designation of the route advertised. For the L2VPN VPLS Inter-AS Option B feature, enter the **neighbor next-hop-self** command at the ASBRs. This forces the pseudowires to be targeted to the ASBR and not targeted to the provider edge (PE) routers. The net result is that a pseudowire for the first autonomous system is stitched to a pseudowire for the second autonomous system by means of a third pseudowire between the ASBRs. This creates a multisegmented pseudowire. For more information about multisegmented pseudowires, see the "L2VPN Multisegment Pseudowires" module.

Note The L2VPN VPLS Inter-AS Option B feature supports Route Processors (RPs), SSO, and NSF.

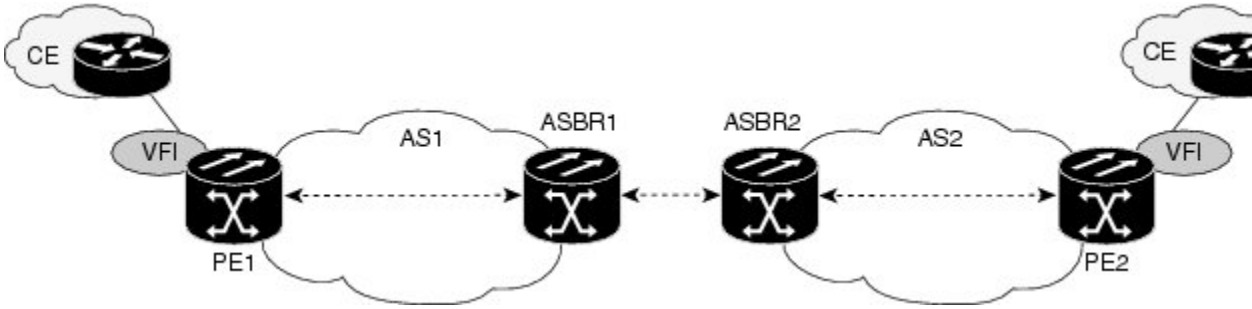
L2VPN VPLS Inter-AS Option B Sample Topology

The figure below illustrates a simplified L2VPN VPLS Inter-AS Option B topology. In this topology, AS1 and AS2 are the autonomous systems. ASBR1 and ASBR2 are ASBRs. A customer edge (CE) router is attached to both AS1 and AS2.

Each autonomous system consists of an ASBR and a PE router. PE1 belongs to a virtual forwarding instance (VFI) in AS1. PE2 belongs to a VFI in AS2. PE1 and PE2 are terminating PEs (TPEs).

Multisegmented pseudowires are created to establish dual connections between the TPE in the local ASBR to the TPE in the neighboring ASBR. The first segment establishes a path between the TPE in AS1 to ASBR1. The next segment establishes a path between the ASBR1 and ASBR2, and the final segment establishes a path between ASBR2 to the TPE in AS2.

Figure 1: Sample L2VPN VPLS Inter-AS Option B Topology



Active and Passive PEs in an L2VPN VPLS Inter-AS Option B Configuration

A TPE terminates a multisegment pseudowire. By default, the TPEs on both ends of a multisegmented pseudowire are in active mode. The L2VPN VPLS Inter-AS Option B feature requires that one of the TPEs be in passive mode. The system determines which PE is the passive TPE based on a comparison of the Target Attachment Individual Identifier (TAII) received from BGP and the Source Attachment Individual Identifier (SAII) of the local router. The TPE with the numerically higher identifier assumes the active role.

When you are configuring the PEs for the L2VPN VPLS Inter-AS Option B feature, use the **terminating-pe tie-breaker**command to negotiate the mode of the TPE. Then use the **mpls ldp discovery targeted-hello accept**command to ensure that a passive TPE can accept Label Distribution Protocol (LDP) sessions from the LDP peers.

For more information about configuring the PEs, see the Enabling L2VPN VPLS Inter-AS Option B on the Provider Edge (PE) Router, on page 13.

Benefits of L2VPN VPLS Inter-AS Option B

Private IP Addresses

While a large number of pseudowires are required, IPv4 reachability is maintained within the ASBR and, therefore, IP addresses are private.

One Targeted LDP Session

With the L2VPN VPLS Inter-AS Option B feature, only one targeted Label Distribution Protocol (LDP) session is created between the autonomous systems. Since only one targeted LDP session between autonomous systems is created, service providers can apply tighter security policies for control plane traffic going across the autonomous system.

How to Configure L2VPN VPLS Inter-AS Option B

Modifying the VPLS Autodiscovery Settings for Use with L2VPN VPLS Inter-AS Option B

Note Before you configure the L2VPN VPLS Inter-AS Option B feature, you must enable the VPLS Autodiscovery: BGP Based feature. Make sure you have enabled the VPLS Autodiscovery: BGP Based feature before proceeding with this task.

For the L2VPN VPLS Inter-AS Option B feature to function properly, you must configure the VPLS ID value and the route-target value for each PE router in the virtual forwarding instance (VFI). To modify these values, complete the following steps at each PE router.

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. **route-target** [**import** | **export** | **both**] {*autonomous-system-number* **:** *nn* | *ip-address* **:** *nn*}
7. **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.
Step 3	**l2 vfi** *vfi-name* **autodiscovery** **Example:** `Router(config)# l2 vfi vpls1 autodiscovery`	Enables the VPLS Autodiscovery: BGP Based feature on the PE router and enters L2 VFI configuration mode.

	Command or Action	Purpose
Step 4	**vpn id** *vpn-id* **Example:** `Router(config-vfi)# vpn id 10`	Configures a VPN ID for the VPLS domain. • Enter a VPN ID value.
Step 5	**vpls-id** {*autonomous-system-number* **:** *nn* | *ip-address* **:** *nn*} **Example:** `Router(config-vfi)# vpls-id 5:300`	Specifies the VPLS ID. • The VPLS Autodiscovery: BGP Based feature automatically generates a VPLS ID using the BGP autonomous system number and the configured VFI VPN ID. Use this command to change the automatically generated VPLS ID for the PE in the VFI. • 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	**route-target** [**import** | **export** | **both**] {*autonomous-system-number* **:** *nn* | *ip-address* **:** *nn*} **Example:** `Router(config-vfi)# route-target 600:2222`	Specifies the route target (RT). • The VPLS Autodiscovery feature automatically generates a route target using the lower 6 bytes of the RD and VPN ID. Use this command to change the automatically generated route target for the PE in the VFI. • 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 7	**exit** **Example:** `Router(config-vfi)# exit`	Exits L2 VFI configuration mode. • Commands take effect after the router exits L2 VFI configuration mode.

What to Do Next

Repeat the steps at each PE in the autonomous system.

Modifying the VPLS Autodiscovery Settings for Use with L2VPN VPLS Inter-AS Option B using the commands associated with the L2VPN Protocol-Based CLIs feature

Note Before you configure the L2VPN VPLS Inter-AS Option B feature, you must enable the VPLS Autodiscovery: BGP Based feature. Make sure you have enabled the VPLS Autodiscovery: BGP Based feature before proceeding with this task.

For the L2VPN VPLS Inter-AS Option B feature to function properly, you must configure the VPLS ID value and the route-target value for each PE router in the virtual forwarding instance (VFI). To modify these values, complete the following steps at each PE router.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **l2vpn vfi context** *vfi-name*
4. **vpn id** *vpn-id*
5. **autodiscovery bgp signaling ldp**
6. **vpls-id** {*autonomous-system-number* **:** *nn* | *ip-address* **:** *nn*}
7. **route-target** [**import** | **export** | **both**] {*autonomous-system-number* **:** *nn* | *ip-address* **:** *nn*}
8. **exit**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**l2vpn vfi context** *vfi-name* **Example:** `Device(config)# l2vpn vfi context vpls1`	Establishes an L2VPN VFI context and enters L2 VFI configuration mode.
Step 4	**vpn id** *vpn-id*	Configures a VPN ID for the VPLS domain.

	Command or Action	Purpose
	Example: `Device(config-vfi)# vpn id 10`	• Enter a VPN ID value.
Step 5	**autodiscovery bgp signaling ldp** **Example:** `Device(config-vfi)# autodiscovery bgp signaling ldp`	Enables the VPLS Autodiscovery: BGP Based feature on the PE router.
Step 6	**vpls-id** {*autonomous-system-number* **:** *nn* | *ip-address* **:** *nn*} **Example:** `Device(config-vfi)# vpls-id 5:300`	Specifies the VPLS ID. • The VPLS Autodiscovery: BGP Based feature automatically generates a VPLS ID using the BGP autonomous system number and the configured VFI VPN ID. Use this command to change the automatically generated VPLS ID for the PE in the VFI. • 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 7	**route-target** [**import** | **export** | **both**] {*autonomous-system-number* **:** *nn* | *ip-address* **:** *nn*} **Example:** `Device(config-vfi)# route-target 600:2222`	Specifies the route target (RT). • The VPLS Autodiscovery feature automatically generates a route target using the lower 6 bytes of the RD and VPN ID. Use this command to change the automatically generated route target for the PE in the VFI. • 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	**exit** **Example:** `Device(config-vfi)# exit`	Exits L2 VFI configuration mode. • Commands take effect after the router exits L2 VFI configuration mode.

What to Do Next

Repeat the steps at each PE in the autonomous system.

Enabling L2VPN VPLS Inter-AS Option B on the ASBR

To enable the L2VPN VPLS Inter-AS Option B feature on the ASBR, complete the following steps on *each* ASBR in the autonomous system.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *autonomous-system-number*
4. **neighbor** {*ip-address* | *peer-group-name*} **next-hop-self**
5. **address-family l2vpn vpls**
6. **no bgp default route-target filter**
7. **exit**
8. **exit**
9. **mpls ldp discovery targeted-hello accept**
10. Complete Steps 11 through 13, only if you are changing the range of VC IDs reserved for switching pseudowires. Otherwise, advance to Step 14.
11. **l2 pseudowire routing**
12. **switching-point vcid** *minimum-vcid-value maximum-vcid-value*
13. **exit**
14. **end**

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.
Step 3	**router bgp** *autonomous-system-number* **Example:** `Router(config)# router bgp 1`	Configures the BGP routing process and enters router configuration mode. • Enter the number of the autonomous system.
Step 4	**neighbor** {*ip-address* | *peer-group-name*} **next-hop-self** **Example:**	Configures the ASBR as the next hop for a BGP-speaking neighbor or peer group. • Enter the IP address or the peer group name.

	Command or Action	Purpose
	`Router(config-router)# neighbor 10.10.0.1 next-hop-self`	**Note** Use this command to identify each PE in the autonomous system.
Step 5	**address-family l2vpn vpls** **Example:** `Router(config-router)# address-family l2vpn vpls`	Configures a routing session using L2VPN endpoint provisioning address information and enters address family configuration mode.
Step 6	**no bgp default route-target filter** **Example:** `Router(config-router-af)# no bgp default route-target filter`	Enables pseudowire switching at the ASBR.
Step 7	**exit** **Example:** `Router(config-router-af) exit`	Exits address family configuration mode.
Step 8	**exit** **Example:** `Router(config-router) exit`	Exits router configuration mode.
Step 9	**mpls ldp discovery targeted-hello accept** **Example:** `Router(config)# mpls ldp discovery targeted-hello accept`	Configures the routers from which LDP sessions will be accepted. • With the **targeted-hello accept** keywords, LDP sessions from *any* router will be accepted. • For the other keyword choices available for this command, see the *Cisco IOS Multiprotocol Label Switching Command Reference*.
Step 10	Complete Steps 11 through 13, only if you are changing the range of VC IDs reserved for switching pseudowires. Otherwise, advance to Step 14.	
Step 11	**l2 pseudowire routing** **Example:** `Router(config))# l2 pseudowire routing`	(Optional) Enters Layer 2 pseudowire routing configuration mode.
Step 12	**switching-point vcid** *minimum-vcid-value maximum-vcid-value* **Example:**	(Optional) Configures a switching point and specifies a virtual circuit (VC) ID range. **Note** With the L2VPN VPLS Inter-AS Option B feature, VC IDs in the VC ID range of 1001 to 2147483647 are

	Command or Action	Purpose
	`Router(config-l2_pw_rtg)# switching-point vcid 200 3500`	reserved for switching pseudowires. This command allows you to change this range if, for example, an existing xconnect VC is using one of the reserved VC IDs.
Step 13	**exit** **Example:** `Router(config-l2_pw_rtg)#) exit`	Exits Layer 2 pseudowire routing configuration mode.
Step 14	**end** **Example:** `Router(config)# end`	Exits global configuration mode.

What to Do Next

Repeat the steps at each ASBR in the autonomous system.

Enabling L2VPN VPLS Inter-AS Option B on the ASBR using the commands associated with the L2VPN Protocol-Based CLIs feature

To enable the layer 2 virtual private network virtual private LAN services (L2VPN VPLS) Inter-AS Option B feature on the autonomous system boundary router (ASBR), perform this task on each ASBR in the autonomous system.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **router bgp** *autonomous-system-number*
4. **neighbor** {*ip-address* | *peer-group-name*} **next-hop-self**
5. **address-family l2vpn vpls**
6. **no bgp default route-target filter**
7. **exit**
8. **exit**
9. **mpls ldp discovery targeted-hello accept**
10. Complete Steps 11 through 13, only if you are changing the range of VC IDs reserved for switching pseudowires. Otherwise, advance to Step 14.
11. **l2vpn**
12. **pseudowire routing**
13. **switching-point vcid** *minimum-vcid-value maximum-vcid-value*
14. **exit**
15. **end**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**configure terminal** **Example:** `Device# configure terminal`	Enters global configuration mode.
Step 3	**router bgp** *autonomous-system-number* **Example:** `Device(config)# router bgp 1`	Configures the BGP routing process and enters router configuration mode. • Enter the number of the autonomous system.
Step 4	**neighbor** {*ip-address* | *peer-group-name*} **next-hop-self** **Example:** `Device(config-router)# neighbor 10.10.0.1 next-hop-self`	Configures the ASBR as the next hop for a BGP-speaking neighbor or peer group. • Enter the IP address or the peer group name. **Note** Use this command to identify each PE in the autonomous system.
Step 5	**address-family l2vpn vpls** **Example:** `Device(config-router)# address-family l2vpn vpls`	Configures a routing session using L2VPN endpoint provisioning address information and enters address family configuration mode.
Step 6	**no bgp default route-target filter** **Example:** `Device(config-router-af)# no bgp default route-target filter`	Enables pseudowire switching at the ASBR.
Step 7	**exit** **Example:** `Device(config-router-af) exit`	Exits address family configuration mode.
Step 8	**exit** **Example:** `Device(config-router) exit`	Exits router configuration mode.

	Command or Action	Purpose
Step 9	**mpls ldp discovery targeted-hello accept** **Example:** `Device(config)# mpls ldp discovery targeted-hello accept`	Configures the routers from which LDP sessions will be accepted. • With the **targeted-hello accept** keywords, LDP sessions from *any* router will be accepted. • For the other keyword choices available for this command, see the *Cisco IOS Multiprotocol Label Switching Command Reference*.
Step 10	Complete Steps 11 through 13, only if you are changing the range of VC IDs reserved for switching pseudowires. Otherwise, advance to Step 14.	
Step 11	**l2vpn** **Example:** `Device(config)# l2vpn`	(Optional) Enters Layer 2 VPN configuration mode.
Step 12	**pseudowire routing** **Example:** `Device(l2vpn-config)# pseudowire routing`	(Optional) Enters Layer 2 pseudowire routing configuration mode.
Step 13	**switching-point vcid** *minimum-vcid-value maximum-vcid-value* **Example:** `Device(config-l2_pw_rtg)# switching-point vcid 200 3500`	(Optional) Configures a switching point and specifies a virtual circuit (VC) ID range. **Note** With the L2VPN VPLS Inter-AS Option B feature, VC IDs in the VC ID range of 1001 to 2147483647 are reserved for switching pseudowires. This command allows you to change this range if, for example, an existing xconnect VC is using one of the reserved VC IDs.
Step 14	**exit** **Example:** `Device(config-l2_pw_rtg)# exit`	Exits Layer 2 pseudowire routing configuration mode.
Step 15	**end** **Example:** `Device(config)# end`	Exits global configuration mode.

What to Do Next

Repeat the steps at each ASBR in the autonomous system.

Enabling L2VPN VPLS Inter-AS Option B on the Provider Edge (PE) Router

To enable the L2VPN VPLS Inter-AS Option B on the PE router, complete the following steps on each PE in the autonomous system.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **l2 pseudowire routing**
4. **terminating-pe tie-breaker**
5. exit
6. **mpls ldp discovery targeted-hello accept**
7. **end**

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.
Step 3	**l2 pseudowire routing** **Example:** `Router(config))# l2 pseudowire routing`	Enters Layer 2 pseudowire routing configuration mode.
Step 4	**terminating-pe tie-breaker** **Example:** `Router(config-l2_pw_rtg)# terminating-pe tie-breaker`	Negotiates the behavior mode (either active or passive) for a terminating provider edge (TPE) route.
Step 5	exit **Example:** `Router(config-l2_pw_rtg)# exit`	Returns to global configuration mode.
Step 6	**mpls ldp discovery targeted-hello accept** **Example:**	Configures the routers from which LDP sessions will be accepted.

	Command or Action	Purpose
	`Router(config)# mpls ldp discovery targeted-hello accept`	• With the **targeted-hello accept** keywords, LDP sessions from *any* router will be accepted. • For the other keyword choices available for this command, see the *Cisco IOS Multiprotocol Label Switching Command Reference* .
Step 7	**end** **Example:** `Router(config)# end`	Exits global configuration mode.

What to Do Next

Repeat the steps at each PE in the autonomous system.

Enabling L2VPN VPLS Inter-AS Option B on the Provider Edge (PE) Router using the commands associated with the L2VPN Protocol-Based CLIs feature

To enable the L2VPN VPLS Inter-AS Option B on the PE router, perform this task on each PE in the autonomous system.

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **l2vpn**
4. **pseudowire routing**
5. **terminating-pe tie-breaker**
6. **end**
7. **mpls ldp discovery targeted-hello accept**
8. **end**

DETAILED STEPS

Procedure

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

	Command or Action	Purpose
	`Device# configure terminal`	
Step 3	**l2vpn** **Example:** `Device(config)# l2vpn`	(Optional) Enters Layer 2 VPN configuration mode.
Step 4	**pseudowire routing** **Example:** `Device(l2vpn-config)# pseudowire routing`	(Optional) Enters Layer 2 pseudowire routing configuration mode.
Step 5	**terminating-pe tie-breaker** **Example:** `Device(config-l2_pw_rtg)# terminating-pe tie-breaker`	Negotiates the behavior mode (either active or passive) for a terminating provider edge (TPE) route.
Step 6	**end** **Example:** `Device(config-l2_pw_rtg)# exit`	Returns to global configuration mode.
Step 7	**mpls ldp discovery targeted-hello accept** **Example:** `Device(config)# mpls ldp discovery targeted-hello accept`	Configures the routers from which LDP sessions will be accepted. • With the **targeted-hello accept** keywords, LDP sessions from *any* router will be accepted. • For the other keyword choices available for this command, see the *Cisco IOS Multiprotocol Label Switching Command Reference*.
Step 8	**end** **Example:** `Device(config)# end`	Exits global configuration mode.

What to Do Next

Repeat the steps at each PE in the autonomous system.

Verifying the L2VPN VPLS Inter-AS Option B Configuration

To verify the L2VPN VPLS Inter-AS Option B configuration, use one or more of the following commands at any router.

SUMMARY STEPS

1. **enable**
2. **show xconnect rib detail**
3. **show mpls l2transport vc** [**detail**] [**pwid** *pw-identifier*] [**vpls-id** *vpls-identifier*] [**stitch** *endpoint endpoint*]
4. **end**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Router> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**show xconnect rib detail** **Example:** `Router# show xconnect rib detail`	(Optional) Displays the information about the pseudowire Routing Information Base (RIB).
Step 3	**show mpls l2transport vc** [**detail**] [**pwid** *pw-identifier*] [**vpls-id** *vpls-identifier*] [**stitch** *endpoint endpoint*] **Example:** `Router# show mpls l2transport vc`	(Optional) Displays the information about Multiprotocol Label Switching (MPLS) Any Transport over ATM (AToM) VCs and static pseudowires that have been enabled to route Layer 2 packets on a router. • Use the optional keywords and arguments, as applicable.
Step 4	**end** **Example:** `Router# end`	Exits privileged EXEC mode.

Verifying the L2VPN VPLS Inter-AS Option B Configuration using the commands associated with the L2VPN Protocol-Based CLIs feature

To verify the L2VPN VPLS Inter-AS Option B configuration, use one or more of the following commands on any router.

SUMMARY STEPS

1. **enable**
2. **show l2vpn rib detail**
3. **show l2vpn atom vc** [**pwid** *pw-identifier*] [**vpls-id** *vpls-identifier*] [**stitch** *endpoint endpoint*][**detail**]
4. **end**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**enable** **Example:** `Device> enable`	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	**show l2vpn rib detail** **Example:** `Device# show l2vpn rib detail`	(Optional) Displays the information about the pseudowire Routing Information Base (RIB).
Step 3	**show l2vpn atom vc** [**pwid** *pw-identifier*] [**vpls-id** *vpls-identifier*] [**stitch** *endpoint endpoint*][**detail**] **Example:** `Device# show l2vpn atom vc`	(Optional) Displays the information about Multiprotocol Label Switching (MPLS) Any Transport over ATM (AToM) VCs and static pseudowires that have been enabled to route Layer 2 packets on a router. • Use the optional keywords and arguments, as applicable.
Step 4	**end** **Example:** `Device# end`	Exits privileged EXEC mode.

Configuration Examples for L2VPN VPLS Inter-AS Option B

Example Modifying the VPLS Autodiscovery Settings for Use with L2VPN VPLS Inter-AS Option B

In the following example, the VPLS Autodiscovery: BGP Based feature is modified for use with the L2VPN VPLS Inter-AS Option B feature:

```
Router> enable

Router# configure terminal

Router(config)# l2 vfi vpls1 autodiscovery

Router(config-vfi)# vpn id 10
```

```
Router(config-vfi)# vpls-id 5:300

Router(config-vfi)# route-target 600:2222

Router(config-vfi)# exit
```

Example: Modifying the VPLS Autodiscovery Settings for Use with L2VPN VPLS Inter-AS Option B using the commands associated with the L2VPN Protocol-Based CLIs feature

In the following example, the VPLS Autodiscovery: BGP Based feature is modified for use with the L2VPN VPLS Inter-AS Option B feature:

```
Device# enable
Device# configure terminal
Device(config)# l2vpn vfi context vpls1
Device(config-vfi)# vpn id id
Device(config-vfi)# autodiscovery bgp signaling ldp
Device(config-vfi)# vpls-id 5:300
Device(config-vfi)# route-target 600:2222
Device(config-vfi)# exit
```

Example Enabling L2VPN VPLS Inter-AS Option B on the ASBR

In the following example, the L2VPN VPLS Inter-AS Option B feature has been configured on one ASBR:

```
Router> enable

Router# configure terminal

Router(config)# router bgp 1

Router(config-router)# neighbor 10.10.0.1 next-hop-self

Router(config-router)# address-family l2vpn vpls

Router(config-router-af)# no bgp default route-target filter

Router(config-router-af)# exit

Router(config-router)# exit

Router(config)# mpls ldp discovery targeted-hello accept

Router(config)# end
```

Example Enabling L2VPN VPLS Inter-AS Option B on the PE Router

In the following example, the L2VPN VPLS Inter-AS Option B feature is configured on a PE router. The PE is also a TPE.

```
Router> enable

Router# configure terminal

Router(config))# l2 pseudowire routing

Router(config-l2_pw_rtg)# terminating-pe tie-breaker

Router(config-l2_pw_rtg)# exit

Router(config)# mpls ldp discovery targeted-hello accept

Router(config)# end
```

Example Enabling L2VPN VPLS Inter-AS Option B on the PE Device using the commands associated with the L2VPN Protocol-Based CLIs feature

In the following example, the L2VPN VPLS Inter-AS Option B feature is configured on a provider edge (PE) router. The PE is also a terminating provider edge (TPE).

```
Device> enable
Device# configure terminal
Device(config)# l2vpn
Device(l2vpn-config)#  pseudowire routing
Device(config-l2_pw_rtg)# terminating-pe tie-breaker
Device(config-l2_pw_rtg)# exit
Device(config)# mpls ldp discovery targeted-hello accept
Device(config)# end
```

Example Verifying the L2VPN VPLS Inter-AS Option B Configuration

The output of the **show xconnect rib detail**command can be used to verify the L2VPN VPLS Inter-AS Option B configuration.

The following is sample output from the **show xconnect rib detail** command when used in an ASBR configuration. On an ASBR, the **show xconnect rib detail** command displays the Layer 2 VPN BGP Network Layer Reachability Information (NLRI) received from the BGP peers. The display also shows the signaling messages received from the targeted LDP sessions for a given TAII.

```
Router# show xconnect rib detail
Local Router ID: 10.1.1.3
VPLS-ID: 1:1, Target ID: 10.1.1.1
  Next-Hop: 10.1.1.1
  Hello-Source: 10.1.1.3
  Route-Target: 2:2
```

```
  Incoming RD: 10.0.0.0:1
  Forwarder:
  Origin: BGP
  Provisioned: Yes
  SAII: 10.0.0.1, LDP Peer Id: 10.255.255.255, VC Id: 1001 ***
  SAII: 10.1.0.1, LDP Peer Id: 10.255.255.255, VC Id: 1002 ***
```

After the passive TPE router receives the BGP information (and before the passive TPE router receives the LDP label), the peer information will be displayed in the output of the **show xconnect rib** command. The peer information will not be displayed in the **show mpls l2transport vc**command because the VFI AToM xconnect has not yet been provisioned.

Therefore, for passive TPEs, the entry “Passive : Yes” is added to the output of the **show xconnect rib detail** command. In addition, the entry “Provisioned: Yes” is displayed after the neighbor xconnect is successfully created (without any retry attempts).

In the sample output, the two lines beginning with “SAII” show that this ASBR is stitching two provider PE routers (10.0.0.1 and 10.1.0.1) to the TAII 10.1.1.1.

Example Verifying the L2VPN VPLS Inter-AS Option B Configuration using the commands associated with the L2VPN Protocol-Based CLIs feature

The output of the **show l2vpn rib detail** command can be used to verify the L2VPN VPLS Inter-AS Option B configuration.

The following is sample output from the **show l2vpn rib detail** command when used in an autonomous system boundary router (ASBR) configuration. On an ASBR, the **show l2vpn rib detail** command displays the Layer 2 VPN BGP Network Layer Reachability Information (NLRI) received from the BGP peers. The display also shows the signaling messages received from the targeted label distribution protocol (LDP) sessions for a given TAII.

```
Device# show l2vpn rib detail
Local Router ID: 10.1.1.3
VPLS-ID: 1:1, Target ID: 10.1.1.1
  Next-Hop: 10.1.1.1
  Hello-Source: 10.1.1.3
  Route-Target: 2:2
  Incoming RD: 10.0.0.0:1
  Forwarder:
  Origin: BGP
  Provisioned: Yes
  SAII: 10.0.0.1, LDP Peer Id: 10.255.255.255, VC Id: 1001 ***
  SAII: 10.1.0.1, LDP Peer Id: 10.255.255.255, VC Id: 1002 ***
```

After the passive terminating provider edge (TPE) router receives the BGP information (and before the passive TPE router receives the LDP label), the peer information will be displayed in the output of the **show l2vpn rib** command. The peer information will not be displayed in the **show l2vpn atom vc** command because the VFI AToM xconnect has not yet been provisioned.

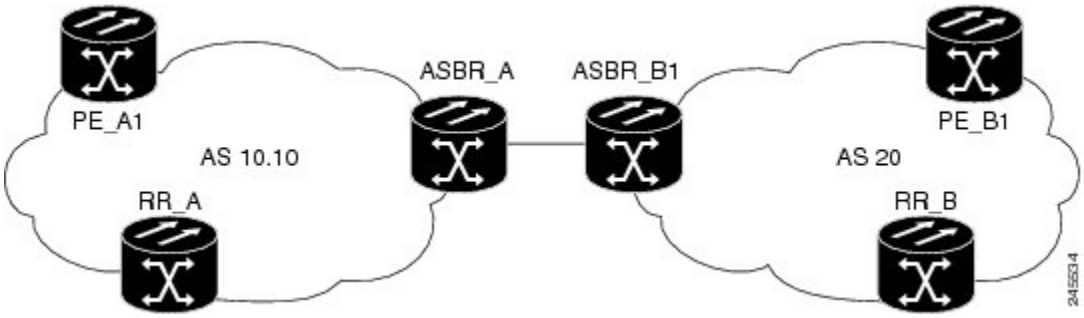
Therefore, for passive TPEs, the entry “Passive : Yes” is added to the output of the **show l2vpn rib detail** command. In addition, the entry “Provisioned: Yes” is displayed after the neighbor xconnect is successfully created (without any retry attempts).

In the sample output, the two lines beginning with “SAII” show that this ASBR is stitching two provider PE routers (10.0.0.1 and 10.1.0.1) to the TAII 10.1.1.1.

Example Sample L2VPN VPLS Inter-AS Option B Configuration

The following is a sample L2VPN VPLS Inter-AS Option B configuration based on the topology shown in the figure below.

Figure 2: L2VPN VPLS Inter-AS Option B Topology Used for Configuration Example



The topology shown in the figure above consists of two PE routers connected across an autonomous system boundary using two ASBRs. Routes are shared within each autonomous system using BGP route reflectors (RRs). (The RRs are included only for the purpose of showing a complete configuration. RRs are not a requirement for the L2VPN Inter-AS Option B configuration.)

The specific configurations for each of the elements in this topology are shown below. The text in bold indicates the additions needed to the standard VPLS Autodiscovery: BGP Based configuration.

PE_A1 Router

```
mpls ldp discovery targeted-hello accept
mpls label protocol ldp
!
l2 router-id 10.1.1.1
!
l2 pseudowire routing
 terminating-pe tie-breaker
!
l2 vfi vfiA autodiscovery
 vpn id 111
 vpls-id 111:111
 rd 111:111
 route-target 111:111
 no auto-route-target
!
!
interface Loopback0
 ip address 10.1.1.1 255.255.255.255
!
!
interface GigabitEthernet2/0/9
 description AS-10.10-Backbone-LAN
 ip address 10.100.100.1 255.255.255.0
 mpls ip
!
router ospf 10
 network 10.1.1.1 0.0.0.0 area 0
 network 10.100.100.1 0.0.0.0 area 0
!
router bgp 10.10
```

```
 bgp asnotation dot
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 neighbor 10.3.3.3 remote-as 10.10
 neighbor 10.3.3.3 description RR-AS-10.10
 neighbor 10.3.3.3 update-source Loopback0
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  neighbor 10.3.3.3 activate
  neighbor 10.3.3.3 send-community extended
 exit-address-family
!
mpls ldp router-id Loopback0
!
```

ASBR_A Router

```
mpls ldp discovery targeted-hello accept
mpls label protocol ldp
!
!
interface Loopback0
 ip address 10.4.4.4 255.255.255.255
!
interface GigabitEthernet1/10
 description AS-10.10-backbone-Lan
 ip address 10.100.100.4 255.255.255.0
 mpls ip
!
interface GigabitEthernet2/0/1
 description B2B-AS-20-ASBR-B1
 ip address 10.12.1.4 255.255.255.0
 mpls ip
!
router ospf 10
 passive-interface GigabitEthernet1/12
 passive-interface GigabitEthernet2/0/1
 passive-interface GigabitEthernet2/0/2
 network 10.4.4.4 0.0.0.0 area 0
 network 10.100.100.4 0.0.0.0 area 0
 network 10.12.0.0 0.0.255.255 area 0
!
router bgp 10.10
 bgp router-id 10.4.4.4
 bgp asnotation dot
 bgp log-neighbor-changes
 no bgp default route-target filter
 no bgp default ipv4-unicast
 timers bgp 10 30
 neighbor AS20 peer-group
 neighbor AS20 remote-as 20
 neighbor 10.3.3.3 remote-as 10.10
 neighbor 10.3.3.3 update-source Loopback0
 neighbor 10.12.1.6 peer-group AS20
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
```

```
 address-family l2vpn vpls
  neighbor AS20 send-community extended
  neighbor AS20 next-hop-self
  neighbor 10.3.3.3 activate
  neighbor 10.3.3.3 send-community extended
  neighbor 10.3.3.3 next-hop-self
  neighbor 12.12.1.6 activate
 exit-address-family
!
ip route 10.6.6.6 255.255.255.255 10.12.1.6
ip route 10.9.9.9 255.255.255.255 10.12.3.9
!
mpls ldp router-id Loopback0
!
```

RR_A Router

```
interface Loopback0
 ip address 10.3.3.3 255.255.255.255
!
interface Ethernet2/0
 ip address 10.100.100.3 255.255.255.0
 duplex half
!
router ospf 10
 network 10.3.3.3 0.0.0.0 area 0
 network 10.100.100.3 0.0.0.0 area 0
!
router bgp 10.10
 bgp asnotation dot
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 neighbor rr-client peer-group
 neighbor rr-client remote-as 10.10
 neighbor rr-client update-source Loopback0
 neighbor 10.1.1.1 peer-group rr-client
 neighbor 10.4.4.4 peer-group rr-client
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  neighbor rr-client send-community extended
  neighbor rr-client route-reflector-client
  neighbor 10.1.1.1 activate
  neighbor 10.4.4.4 activate
 exit-address-family
!
```

PE_B1 Router

```
mpls ldp discovery targeted-hello accept
mpls label protocol ldp
!
l2 router-id 10.5.5.5
l2 pseudowire routing
 terminating-pe tie-breaker
l2 vfi vfiA autodiscovery
 vpn id 111
 vpls-id 111:111
```

```
 rd 111:111
 route-target 111:111
 no auto-route-target
!
interface Loopback0
 ip address 10.5.5.5 255.255.255.255
!
interface GigabitEthernet2/0/7
 description AS20-Backbone-LAN
 ip address 10.100.100.5 255.255.255.0
 mpls ip
!
router ospf 20
 network 10.5.5.5 0.0.0.0 area 0
 network 10.100.100.5 0.0.0.0 area 0
!
router bgp 20
 bgp router-id 10.5.5.5
 bgp asnotation dot
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 neighbor 10.8.8.8 remote-as 20
 neighbor 10.8.8.8 update-source Loopback0
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  neighbor 10.8.8.8 activate
  neighbor 10.8.8.8 send-community extended
 exit-address-family
!
mpls ldp router-id Loopback0
!
```

ASBR_B1 Router

```
mpls ldp discovery targeted-hello accept
mpls label protocol ldp
!
l2 router-id 10.6.6.6
l2 pseudowire routing
 terminating-pe tie-breaker
!
interface Loopback0
 ip address 10.6.6.6 255.255.255.255
!
interface Ethernet1/3
 description B2B-AS-10.10-ASBR-A
 ip address 10.12.1.6 255.255.255.0
 duplex half
 mpls ip
!
interface Ethernet2/1
 description AS-20-backbone-Lan
 ip address 10.100.100.6 255.255.255.0
 duplex half
 mpls ip
!
router ospf 20
 passive-interface Ethernet1/3
 network 10.12.1.6 0.0.0.0 area 0
```

```
 network 10.6.6.6 0.0.0.0 area 0
 network 10.100.100.6 0.0.0.0 area 0
!
router bgp 20
 bgp router-id 10.6.6.6
 bgp asnotation dot
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 timers bgp 10 30
 neighbor 10.12.1.4 remote-as 10.10
 neighbor 10.12.1.4 ebgp-multihop 255
 neighbor 10.8.8.8 remote-as 20
 neighbor 10.8.8.8 update-source Loopback0
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  no bgp default route-target filter
  neighbor 10.12.1.4 activate
  neighbor 10.12.1.4 send-community extended
  neighbor 10.12.1.4 next-hop-self
  neighbor 10.8.8.8 activate
  neighbor 10.8.8.8 send-community extended
  neighbor 10.8.8.8 next-hop-self
 exit-address-family
!
```

RR_B Router

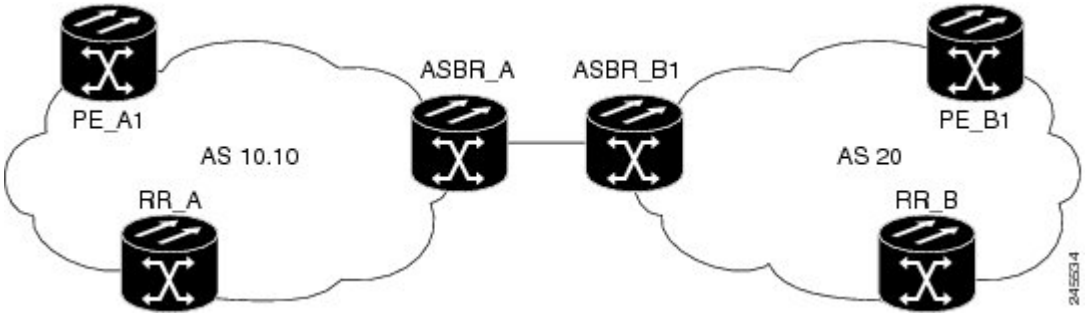
```
interface Loopback0
 ip address 10.8.8.8 255.255.255.255
!
interface Ethernet2/1
 ip address 10.100.100.8 255.255.255.0
 duplex half
!
router ospf 20
 network 10.8.8.8 0.0.0.0 area 0
 network 10.100.100.8 0.0.0.0 area 0
!
router bgp 20
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 neighbor rrc peer-group
 neighbor rrc remote-as 20
 neighbor rrc update-source Loopback0
 neighbor 10.5.5.5 peer-group rrc
 neighbor 10.6.6.6 peer-group rrc
 neighbor 10.9.9.9 peer-group rrc
 neighbor 10.9.9.9 shutdown
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  neighbor rrc send-community extended
  neighbor rrc route-reflector-client
  neighbor 10.5.5.5 activate
  neighbor 10.6.6.6 activate
  neighbor 10.9.9.9 activate
```

```
 exit-address-family
!
```

Example Sample L2VPN VPLS Inter-AS Option B Configuration using the commands associated with the L2VPN Protocol-Based CLIs feature

The example below is a sample L2VPN VPLS Inter-AS Option B configuration based on the topology shown in the following figure.

Figure 3: L2VPN VPLS Inter-AS Option B Topology Used for Configuration Example



The topology shown in the figure above consists of two provider edge (PE) routers connected across an autonomous system boundary using two ASBRs. Routes are shared within each autonomous system using BGP route reflectors (RRs). (The RRs are included only for the purpose of showing a complete configuration. RRs are not a requirement for the L2VPN Inter-AS Option B configuration.)

The specific configurations for each of the elements in this topology are shown below. The commands highlighted in bold indicate the additions needed to the standard VPLS Autodiscovery: BGP Based configuration.

PE_A1 Router

```
mpls ldp discovery targeted-hello accept
mpls label protocol ldp
!
l2vpn
 router-id 10.1.1.1
 pseudowire routing
   terminating-pe tie-breaker
!
l2vpn vfi context vfiA
 vpn id 111
 autodiscovery bgp signaling ldp
 vpls-id 111:111
 rd 111:111
 route-target 111:111
 no auto-route-target
!
!
interface Loopback0
 ip address 10.1.1.1 255.255.255.255
!
!
interface GigabitEthernet2/0/9
 description AS-10.10-Backbone-LAN
```

```
 ip address 10.100.100.1 255.255.255.0
 mpls ip
!
router ospf 10
 network 10.1.1.1 0.0.0.0 area 0
 network 10.100.100.1 0.0.0.0 area 0
!
router bgp 10.10
 bgp asnotation dot
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 neighbor 10.3.3.3 remote-as 10.10
 neighbor 10.3.3.3 description RR-AS-10.10
 neighbor 10.3.3.3 update-source Loopback0
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  neighbor 10.3.3.3 activate
  neighbor 10.3.3.3 send-community extended
 exit-address-family
!
mpls ldp router-id Loopback0
!
```

ASBR_A Router

```
mpls ldp discovery targeted-hello accept
mpls label protocol ldp
!
!
interface Loopback0
 ip address 10.4.4.4 255.255.255.255
!
interface GigabitEthernet1/10
 description AS-10.10-backbone-Lan
 ip address 10.100.100.4 255.255.255.0
 mpls ip
!
interface GigabitEthernet2/0/1
 description B2B-AS-20-ASBR-B1
 ip address 10.12.1.4 255.255.255.0
 mpls ip
!
router ospf 10
 passive-interface GigabitEthernet1/12
 passive-interface GigabitEthernet2/0/1
 passive-interface GigabitEthernet2/0/2
 network 10.4.4.4 0.0.0.0 area 0
 network 10.100.100.4 0.0.0.0 area 0
 network 10.12.0.0 0.0.255.255 area 0
!
router bgp 10.10
 bgp router-id 10.4.4.4
 bgp asnotation dot
 bgp log-neighbor-changes
 no bgp default route-target filter
 no bgp default ipv4-unicast
 timers bgp 10 30
 neighbor AS20 peer-group
 neighbor AS20 remote-as 20
```

```
 neighbor 10.3.3.3 remote-as 10.10
 neighbor 10.3.3.3 update-source Loopback0
 neighbor 10.12.1.6 peer-group AS20
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  neighbor AS20 send-community extended
  neighbor AS20 next-hop-self
  neighbor 10.3.3.3 activate
  neighbor 10.3.3.3 send-community extended
  neighbor 10.3.3.3 next-hop-self
  neighbor 12.12.1.6 activate
 exit-address-family
!
ip route 10.6.6.6 255.255.255.255 10.12.1.6
ip route 10.9.9.9 255.255.255.255 10.12.3.9
!
mpls ldp router-id Loopback0
!
```

RR_A Router

```
interface Loopback0
 ip address 10.3.3.3 255.255.255.255
!
interface Ethernet2/0
 ip address 10.100.100.3 255.255.255.0
 duplex half
!
router ospf 10
 network 10.3.3.3 0.0.0.0 area 0
 network 10.100.100.3 0.0.0.0 area 0
!
router bgp 10.10
 bgp asnotation dot
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 neighbor rr-client peer-group
 neighbor rr-client remote-as 10.10
 neighbor rr-client update-source Loopback0
 neighbor 10.1.1.1 peer-group rr-client
 neighbor 10.4.4.4 peer-group rr-client
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  neighbor rr-client send-community extended
  neighbor rr-client route-reflector-client
  neighbor 10.1.1.1 activate
  neighbor 10.4.4.4 activate
 exit-address-family
!
```

PE_B1 Router

```
mpls ldp discovery targeted-hello accept
```

```
mpls label protocol ldp
!
l2vpn
 router-id 10.5.5.5
 pseudowire routing
  terminating-pe tie-breaker
l2vpn vfi context vfiA
 vpn id 111
 autodiscovery bgp signaling ldp
 vpls-id 111:111
 rd 111:111
 route-target 111:111
 no auto-route-target
!
interface Loopback0
 ip address 10.5.5.5 255.255.255.255
!
interface GigabitEthernet2/0/7
 description AS20-Backbone-LAN
 ip address 10.100.100.5 255.255.255.0
 mpls ip
!
router ospf 20
 network 10.5.5.5 0.0.0.0 area 0
 network 10.100.100.5 0.0.0.0 area 0
!
router bgp 20
 bgp router-id 10.5.5.5
 bgp asnotation dot
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 neighbor 10.8.8.8 remote-as 20
 neighbor 10.8.8.8 update-source Loopback0
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  neighbor 10.8.8.8 activate
  neighbor 10.8.8.8 send-community extended
 exit-address-family
!
mpls ldp router-id Loopback0
!
```

ASBR_B1 Router

```
mpls ldp discovery targeted-hello accept
mpls label protocol ldp
!
l2vpn
 router-id 10.6.6.6
 pseudowire routing
  terminating-pe tie-breaker
!
interface Loopback0
 ip address 10.6.6.6 255.255.255.255
!
interface Ethernet1/3
 description B2B-AS-10.10-ASBR-A
 ip address 10.12.1.6 255.255.255.0
 duplex half
```

```
 mpls ip
!
interface Ethernet2/1
 description AS-20-backbone-Lan
 ip address 10.100.100.6 255.255.255.0
 duplex half
 mpls ip
!
router ospf 20
 passive-interface Ethernet1/3
 network 10.12.1.6 0.0.0.0 area 0
 network 10.6.6.6 0.0.0.0 area 0
 network 10.100.100.6 0.0.0.0 area 0
!
router bgp 20
 bgp router-id 10.6.6.6
 bgp asnotation dot
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 timers bgp 10 30
 neighbor 10.12.1.4 remote-as 10.10
 neighbor 10.12.1.4 ebgp-multihop 255
 neighbor 10.8.8.8 remote-as 20
 neighbor 10.8.8.8 update-source Loopback0
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  no bgp default route-target filter
  neighbor 10.12.1.4 activate
  neighbor 10.12.1.4 send-community extended
  neighbor 10.12.1.4 next-hop-self
  neighbor 10.8.8.8 activate
  neighbor 10.8.8.8 send-community extended
  neighbor 10.8.8.8 next-hop-self
 exit-address-family
!
```

RR_B Router

```
interface Loopback0
 ip address 10.8.8.8 255.255.255.255
!
interface Ethernet2/1
 ip address 10.100.100.8 255.255.255.0
 duplex half
!
router ospf 20
 network 10.8.8.8 0.0.0.0 area 0
 network 10.100.100.8 0.0.0.0 area 0
!
router bgp 20
 bgp log-neighbor-changes
 no bgp default ipv4-unicast
 neighbor rrc peer-group
 neighbor rrc remote-as 20
 neighbor rrc update-source Loopback0
 neighbor 10.5.5.5 peer-group rrc
 neighbor 10.6.6.6 peer-group rrc
 neighbor 10.9.9.9 peer-group rrc
 neighbor 10.9.9.9 shutdown
```

```
 !
 address-family ipv4
  no auto-summary
 exit-address-family
 !
 address-family l2vpn vpls
  neighbor rrc send-community extended
  neighbor rrc route-reflector-client
  neighbor 10.5.5.5 activate
  neighbor 10.6.6.6 activate
  neighbor 10.9.9.9 activate
 exit-address-family
!
```

Additional References for L2VPN VPLS Inter-AS Option B

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Command List, All Releases
MPLS commands	Cisco IOS Multiprotocol Label Switching Command Reference
IP Routing (BGP) commands	Cisco IOS IP Routing: BGP Command Reference
Concepts and tasks related to configuring the VPLS Autodiscovery: BGP Based feature.	*VPLS Autodiscovery BGP Based*
BGP support for the L2VPN address family	*BGP Support for the L2VPN Address Family*
VPLS	"VPLS Overview" section in the *Configuring Multiprotocol Label Switching on the Optical Services Modules* document
L2VPN multisegment pseudowires, MPLS OAM support for L2VPN multisegment pseudowires, MPLS OAM support for L2VPN inter-AS option B	*L2VPN Multisegment Pseudowires*

Standards

Standard	Title
No new or modified standards are supported, and support for existing standards has not been modified.	—

MIBs

MIB	MIBs Link
No new or modified MIBs are supported, and support for existing standards has not been modified.	To locate and download MIBs for selected platforms, Cisco software releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

RFCs

RFC	Title
RFC 4360	*BGP Extended Communities Attribute*
RFC 4364	*BGP/MPLS IP Virtual Private Networks (VPNs)*

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 L2VPN VPLS Inter-AS Option B

Table 1: Feature Information for L2VPN VPLS Inter-AS Option B

Feature Name	Releases	Feature Information
L2VPN VPLS Inter-AS Option B	15.1(1)S Cisco IOS XE Release 3.8S	The L2VPN VPLS Inter-AS Option B feature expands the existing features of VPLS autodiscovery to operate across multiple BGP autonomous systems. Using BGP-based autodiscovery as the underlying framework, the L2VPN VPLS Inter-AS Option B features creates a dynamic multisegmented pseudowire configuration between neighboring ASBRs. The following commands were introduced or modified: **bgp default route-target filter**, **debug xconnect**, **l2 pseudowire routing**, **show ip bgp neighbors**, **show mpls forwarding-table**, **show mpls l2transport vc**, **show xconnect**, **switching-point vcid**, and **terminating-pe tie-breaker**.

Glossary

AGI —Attachment Group Identifier. An identifier common to a group of pseudowires that may be connected.

AII —Attachment individual identifier.

ASBR —Autonomous System Boundary Router.

PE —provider edge router.

NLRI —Network Layer Reachability Information.

SAII —Source Attachment Individual Identifier.

SPE —switching PE.

TAII —Target Attachment Individual Identifier.

TPE —terminating PE.

VFI —virtual forwarding instance. This identifies a group of pseudowires that are associated with a VSI.

VSI —virtual switching instance. This identifies the bridge domain within a single PE. In a single VPLS network, each participating PE has a VSI.