



Managing Ethernet Virtual Circuit (EVC) Services

This chapter describes how to use Prime Provisioning policies and service requests to manage various Ethernet Virtual Circuit services. It contains the following sections:

- [Setting Up the Prime Provisioning Services, page 3-7](#)
- [Creating an EVC Ethernet Policy, page 3-19](#)
- [Managing an EVC Ethernet Service Request, page 3-22](#)
- [Creating an EVC ATM-Ethernet Interworking Policy, page 3-31](#)
- [Customizing EVC and MPLS Policies, page 3-34](#)
- [Managing an EVC ATM-Ethernet Interworking Service Request, page 3-34](#)
- [Deploying, Monitoring, and Auditing Service Requests, page 3-51](#)
- [Provisioning VPLS Autodiscovery on Devices using EVC Service Requests, page 3-52](#)
- [Policy and Service Request Attributes Reference Tables, page 3-56](#)
- [Sample Configlets, page 3-120](#)

Getting Started

This section provides a road map to help you get started using the EVC component in Cisco Prime Provisioning 6.8. It contains the following sections:

- [Overview, page 3-2](#)
- [Prepopulating a Service by Selecting Endpoints in Prime Network, page 3-2](#)
- [Installing Prime Provisioning and Configuring the Network, page 3-3](#)
- [Configuring the Network to Support Layer 2 Services, page 3-3](#)
- [Setting Up Basic Prime Provisioning Services, page 3-3](#)
- [Working with EVC Policies and Service Requests, page 3-5](#)
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Overview

Before you can use the EVC component to provision Layer 2 services, you must complete several installation and configuration steps, as outlined in this section. In addition, you should be familiar with basic concepts for Prime Provisioning. The following subsections provide a summary of the key tasks you must accomplish to be able to provision EVC services using Prime Provisioning. You can use the information in this section as a checklist. Where appropriate, references to other sections in this guide or to other guides in the Prime Provisioning documentation set are provided. See the referenced documentation for more detailed information. After the basic installation and configuration steps are completed for Prime Provisioning, see the subsequent sections to create and provision EVC services.

Prepopulating a Service by Selecting Endpoints in Prime Network

It is possible to create service by picking endpoints on a map in Prime Network Vision, when Prime Provisioning and Prime Network are integrated with Prime Central.

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- Step 1** On any map, select one or more endpoint devices by using CTRL click.
 - Step 2** In the right click menu, select **Fulfill/Create Service**.
 - Step 3** You will be taken to the same first screen as you see when creating a service in Prime Provisioning.
 - Step 4** Pick a policy.
Depending on the number of endpoints selected, not all policies will work.
 - Step 5** Once you have selected the policy, the service request main page will appear as usual, prepopulated with links and with the selected devices.
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Installing Prime Provisioning and Configuring the Network

Before you can use the EVC module in Prime Provisioning to provision EVC services, you must first install Prime Provisioning and do the basic network configuration required to support Prime Provisioning. Details on these steps are provided in [Chapter 2, “Before Setting Up Prime Provisioning.”](#) See that chapter for information about Prime Provisioning installation and general network configuration requirements.

Configuring the Network to Support Layer 2 Services

In addition to basic network configuration required for Prime Provisioning, you must perform the following network configuration steps to support Layer 2 services. Information on doing these steps is not provided in the Prime Provisioning documentation. See the documentation for your devices for information on how to perform these steps.

1. Enable MPLS on the core-facing interfaces of the N-PE devices attached to the provider core.
2. Set up /32 loopback addresses on N-PE devices. These loopback addresses should be the termination of the LDP connection(s).
3. Set all Layer 2 devices (switches) to VTP transparent mode. This ensures that none of the switches will operate as VLAN servers and will prevent VLAN information from automatically propagating through the network.

Setting Up Basic Prime Provisioning Services

After the basic network configuration tasks are completed to support Prime Provisioning and L2 services, you use Prime Provisioning to define elements in the Prime Provisioning repository, such as providers and regions, customers and sites, devices, VLAN and VC pools, NPCs, and other resources that are necessary to provision L2 services. Detailed steps to perform general Prime Provisioning tasks are covered in [Chapter 2, “Before Setting Up Prime Provisioning.”](#) You can also find a summary of some important Prime Provisioning set up tasks in [Setting Up the Prime Provisioning Services, page 3-7](#). The information below is a checklist of basic Prime Provisioning services you must set up before provisioning L2 services.

Setting Up Providers, Customers, and Devices

Perform the following steps to set up providers, customers, and devices in the Prime Provisioning repository. These are global resources that can be used by all Prime Provisioning services.

1. **Set up service providers and regions.** The region is important because a single provider could have multiple networks. The region is used as a further level of differentiation to allow for such circumstances. To create a provider and a region, see [Setting Up Resources, page 2-39](#). See also [Defining a Service Provider and Its Regions, page 3-9](#).
2. **Set up customers and customer sites.** A customer is a requestor of a VPN service from an ISP. Each customer can own many customer sites. Each customer site belongs to one and only one Customer and can own many CEs. For detailed steps to create customers and sites, see [Setting Up Resources, page 2-39](#). See also [Defining Customers and Their Sites, page 3-9](#).

3. **Import or add raw devices.** Every network element that Prime Provisioning manages must be defined as a device in the Prime Provisioning repository. An element is any device from which Prime Provisioning can collect information. In most cases, devices are Cisco IOS routers and switches. It is recommended that you discover and import devices via Prime Network. However, you can also set up devices in Prime Provisioning manually or by importing device configuration files.
4. **Assign devices roles as PE or CE.** After devices are created in Prime Provisioning, you must define them as customer (CE) or provider (PE) devices. You do this by editing the device attributes on individual devices or in batch editing through the Prime Provisioning inventory manager. To set device attributes, see [Setting Up Devices and Device Groups, page 2-1](#).

Setting Up the N-PE Loopback Address

Within Prime Provisioning, you must set the loopback address on the N-PE device(s). For details about this procedure, see [Setting Up the N-PE Loopback Address, page 3-4](#).

Setting Up Prime Provisioning Resources for EVC Services

Some Prime Provisioning resources, such as access domains, VLAN pools, and VC pools are set up to support Prime Provisioning EVC services only. To set up these resources, perform the following steps.

1. **Create access domain(s).** For EVC services, you create an access domain if you provision an Ethernet-based service and want Prime Provisioning to automatically assign a VLAN for the link from the VLAN pool. For each Layer 2 access domain, you need a corresponding access domain object in Prime Provisioning. During creation, you select all the N-PE devices that are associated with this domain. Later, one VLAN pool can be created for an access domain. For detailed steps to create access domains, see [Setting Up Resources, page 2-39](#). See also [Creating Access Domains, page 3-10](#).



Note

Creating the access domain is not mandatory. The Access Domain needs to be created in Prime Provisioning only when VLAN resources are managed through Prime Provisioning.

2. **Create VLAN pool(s).** A VLAN pool is created for each access domain. For EVC services, you create a VLAN pool so that Prime Provisioning can assign a VLAN to the links. VLAN ID pools are defined with a starting value and a size. For detailed steps to create VLAN pools, see [Setting Up Resources, page 2-39](#). See also [Creating VLAN Pools, page 3-10](#).
3. **Create VC pool(s).** VC ID pools are defined with a starting value and a size of the VC ID pool. A given VC ID pool is not attached to any inventory object (a provider or customer). Create one VC ID pool per network. For detailed steps to create VC pools, see [Setting Up Resources, page 2-39](#). See also [Creating a VC ID Pool, page 3-11](#).
4. **Create interface access domain:** For EVC services, you create an Interface Access Domain if you provision an Ethernet-based service and want Prime Provisioning to automatically assign an EVC Outer VLAN for the link from the Outer VLAN resource pool. For each Layer 2 Interface Access Domain, you need a corresponding Interface Access Domain object in Prime Provisioning. During creation, select all the interfaces of a N-PE device that are associated with this interface access domain. At a later time, one EVC Outer VLAN pool can be created for this domain.

Setting Up NPCs

Before creating an EVC service request, you must predefine the physical links between U-PEs and N-PEs. The Named Physical Circuit (NPC) represents a link going through a group of physical ports. Thus, more than one logical link can be provisioned on the same NPC. Therefore, the NPC is defined once but used by several EVC service requests. For detailed steps to create NPCs, see [Setting Up Logical Inventory, page 2-53](#). See also [Creating Named Physical Circuits, page 3-12](#).

Setting Up VPNs

You must define VPNs before provisioning EVC services. Normally for EVC services, one VPN can be shared by different service types but for EVC-VPLS, one VPN is required for each VPLS instance. To define VPNs, see [Setting Up Logical Inventory, page 2-53](#). See also [Defining VPNs, page 3-9](#).

Working with EVC Policies and Service Requests

After you have set up providers, customers, devices, and resources in Prime Provisioning, you are ready to create EVC policies, provision service requests (SRs), and deploy the services. After the service requests are deployed you can monitor, audit and run reports on them. All of these tasks are covered in this guide. To accomplish these tasks, perform the following steps.



Note

For Ethernet (E-Line and E-LAN) services, use of the EVC policy and service request is recommended. If you are provisioning services using the EVC syntax, or plan to do so in the future, use the EVC service. Existing services that have been provisioned using the L2VPN and VPLS service policy types are still supported and can be maintained with those service types.

1. **Review overview information about L2 services concepts.** See the chapter “Prime Provisioning Layer 2 VPN Concepts” in the *Cisco Prime Provisioning 6.8 Administration Guide*.
 2. **Set up an EVC policy.** See the appropriate section, depending on the type of policy you want to create:
 - [Creating an EVC Ethernet Policy, page 3-19](#)
 - [Creating an EVC ATM-Ethernet Interworking Policy, page 3-31](#)
 3. **Provision the EVC service request.** See the appropriate section, depending on the type service request you want to provision:
 - [Managing an EVC Ethernet Service Request, page 3-22](#)
 - [Managing an EVC ATM-Ethernet Interworking Service Request, page 3-34](#)
 4. **Deploy the service request.** See [Deploying, Monitoring, and Auditing Service Requests, page 3-51](#).
 5. **Check the status of deployed services.** You can use one or more of the following methods:
 - Monitor service requests. See [Deploying, Monitoring, and Auditing Service Requests, page 3-51](#).
 - Audit service requests. See [Deploying, Monitoring, and Auditing Service Requests, page 3-51](#).
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A Note on Terminology Conventions

The Prime Provisioning GUI and this chapter of the user guide use specific naming conventions for Ethernet services. These align closely with the early MEF conventions. This is expected to be updated in future releases of to conform with current MEF conventions. For reference, the equivalent terms used by the MEF forum are summarized in [Table 3-1](#).

See the chapter “Prime Provisioning Layer 2 VPN Concepts,” in the [Cisco Prime Provisioning 6.8 Administration Guide](#), for more information on terminology conventions and how these align with underlying network technologies.

Table 3-1 Ethernet Service Terminology Mappings

Term Used in GUI and This User Guide	Current MEF Equivalent Term
L2VPN over MPLS Core	
Ethernet Wire Service (EWS)	Ethernet Private Line (EPL)
Ethernet Relay Service (ERS)	Ethernet Virtual Private Line (EVPL)
ATM over MPLS (ATMoMPLS)	—
Frame Relay over MPLS (FRoMPLS)	—
VPLS Over MPLS Core	
Ethernet Wire Service (EWS) or Ethernet Multipoint Service (EMS)	Ethernet Private LAN (EP-LAN)
Ethernet Relay Service (ERS) or Ethernet Relay Multipoint Service (ERMS)	Ethernet Virtual Private LAN (EVP-LAN)
VPLS over Ethernet Core	
Ethernet Wire Service (EWS)	Ethernet Private LAN (EP-LAN)
Ethernet Relay Service (ERS)	Ethernet Virtual Private LAN (EVP-LAN)

Setting Up the Prime Provisioning Services

To create EVC policies and service requests, you must first define the service-related elements, such as target devices, VPNs, and network links. Normally, you create these elements once.

This section contains the basic steps to set up the Cisco Prime Provisioning 6.8 resources. It contains the following sections:

- [Creating Target Devices and Assigning Roles \(N-PE or U-PE\), page 3-7](#)
- [Configuring Device Settings to Support Prime Provisioning, page 3-7](#)
- [Defining a Service Provider and Its Regions, page 3-9](#)
- [Defining Customers and Their Sites, page 3-9](#)
- [Defining VPNs, page 3-9](#)
- [Creating Access Domains, page 3-10](#)
- [Creating VLAN Pools, page 3-10](#)
- [Creating Inner and Outer VLAN Pools, page 3-11](#)
- [Creating a VC ID Pool, page 3-11](#)
- [Creating Named Physical Circuits, page 3-12](#)
- [Creating and Modifying Pseudowire Classes, page 3-15](#)

Creating Target Devices and Assigning Roles (N-PE or U-PE)

Every network element that Prime Provisioning manages must be defined as a device in the system. An element is any device from which Prime Provisioning can collect information. In most cases, devices are Cisco IOS routers that function as N-PE, U-PE, or P. For detailed steps to create devices, see [Setting Up Devices and Device Groups, page 2-1](#).

Configuring Device Settings to Support Prime Provisioning

Two device settings must be configured to support the use of Prime Provisioning in the network:

- Switches in the network must be operating in VTP transparent mode.
- Loopback addresses must be set on N-PE devices.



Note

These are the two minimum device settings required for Prime Provisioning to function properly in the network. You must, of course, perform other device configuration steps for the proper functioning of the devices in the network.

Configuring Switches in VTP Transparent Mode

For security reasons, Prime Provisioning requires VTPs to be configured in transparent mode on all the switches involved in ERS or EWS services before provisioning L2VPN service requests. To set the VTP mode, enter the following Cisco IOS commands:

```
Switch# configure terminal
Switch(config)# vtp mode transparent
```

Enter the following Cisco IOS command to verify that the VTP mode has changed to transparent:

```
Switch# Show vtp status
```

Setting the Loopback Addresses on N-PE Devices

The loopback address for the N-PE has to be properly configured for an Any Transport over MPLS (AToMPLS) connection. The IP address specified in the loopback interface must be reachable from the remote pairing PE. The label distribution protocol (LDP) tunnels are established between the two loopback interfaces of the PE pair. To set the PE loopback address, perform the following steps.

-
- Step 1** Choose **Inventory > Provider Devices**.
The Provider Devices window appears.
- Step 2** Choose a specific PE device and click the **Edit** button.
The Edit Provider Device window appears.
To prevent a wrong loopback address being entered into the system, the Loopback IP Address field on the GUI is read-only.
- Step 3** Choose the loopback address by clicking the **Select** button (in the Loopback IP Address attribute).
The Select Device Interface window appears.
- Step 4** Choose one of the loopback addresses listed in the Interface Name column.
This step ensures that you choose only a valid loopback address defined on the device.
- Step 5** To further narrow the search, you can check the **LDP Termination Only** check box and click the **Select** button.
This limits the list to the LDP-terminating loopback interface(s).
-

Setting Up Devices for IOS XR Support

L2VPN in Cisco Prime Provisioning 6.8, supports devices running Cisco's IOS XR software. In L2VPN, IOS XR is only supported on Cisco XR12000 and CRS-1 series routers functioning as network provider edge (N-PE) devices.

In L2VPN, the following E-line services are supported for IOS XR:

- Point-to-point ERS with or without a CE.
- Point-to-point EWS with or without a CE.

The following L2VPN features are not supported for IOS XR:

- Standard UNI port on an N-PE running IOS XR. (The attribute **Standard UNI Port** in the Link Attributes window is disabled when the UNI is on an N-PE device running IOS XR.)
- SVI interfaces on N-PEs running IOS XR. (The attribute **N-PE Pseudo-wire On SVI** in the Link Attributes window is disabled for IOS XR devices.)
- Pseudowire tunnel selection. (The attribute **PW Tunnel Selection** in the Link Attributes window is disabled for IOS XR devices.)
- EWS UNI (dot1q tunnel or Q-in-Q) on an N-PE running IOS XR.
- Frame Relay/ATM and VPLS services.

To enable IOS XR support in L2VPN, perform the following steps.

-
- Step 1** Set the DCPL property `Provisioning\Service\l2vpn\platform\CISCO_ROUTER\IosXRConfigType` to XML.
- Possible values are CLI, CLI_XML, and XML (the default).
- Step 2** Create the device in Prime Provisioning as an IOS XR device, as follows:
- Create the Cisco device by choosing **Inventory > Devices > Create Cisco Device**.
 - Choose **Cisco Device** in the drop-down list.
The Create Cisco Router window appears.
 - Set the **OS** attribute, located under Device and Configuration Access Information, to `IOS_XR`.
-  **Note** For additional information on setting DCPL properties and creating Cisco devices, see [Appendix G, “Property Settings”](#) or see instructions in the *Cisco Prime Provisioning 6.8 Administration Guide*.
-
- Step 3** Create and deploy L2VPN service requests, following the procedures in this guide.
-

Sample configlets for IOS XR devices are provided in [Sample Configlets, page 3-120](#).

Defining a Service Provider and Its Regions

You must define the service provider administrative domain before provisioning L2VPN. The provider administrative domain is the administrative domain of an ISP with one BGP autonomous system (AS) number. The network owned by the provider administrative domain is called the backbone network. If an ISP has two AS numbers, you must define it as two provider administrative domains. Each provider administrative domain can own many region objects.

For detailed steps to define the provider administrative domain, see [Setting Up Resources, page 2-39](#).

Defining Customers and Their Sites

You must define customers and their sites before provisioning L2VPN. A customer is a requestor of a VPN service from an ISP. Each customer can own many customer sites. Each customer site belongs to one and only one Customer and can own many CPEs. For detailed steps to create customers, see [Setting Up Resources, page 2-39](#).

Defining VPNs

You must define VPNs before provisioning L2VPN or VPLS services. In L2VPN, one VPN can be shared by different service types. In VPLS, one VPN is required for each VPLS instance. For detailed steps to create VPNs, see [Setting Up Logical Inventory, page 2-53](#).

**Note**

The VPN in L2VPN is only a name used to group all the L2VPN links. It has no intrinsic meaning as it does for MPLS VPN.

Creating Access Domains

For L2VPN and VPLS, you create an Access Domain if you provision an Ethernet-based service and want Prime Provisioning to automatically assign a VLAN for the link from the VLAN pool.

For each Layer 2 access domain, you need a corresponding Access Domain object in Prime Provisioning. During creation, you select all the N-PE devices that are associated with this domain. Later, one VLAN pool can be created for an Access Domain. This is how N-PEs are automatically assigned a VLAN.

Before you begin, be sure that you:

- Know the name of the access domain that you want to create.
- Have created a service provider to associate with the new access domain.
- Have created a provider region associated with your provider and PE devices.
- Have created PE devices to associate with the new access domain.
- Know the starting value and size of each VLAN to associate with the new access domain.
- Know which VLAN will serve as the management VLAN.

For detailed steps on creating Access Domains, see [Setting Up Resources, page 2-39](#).

Creating VLAN Pools

For L2VPN and VPLS, you create a VLAN pool so that Prime Provisioning can assign a VLAN to the links. VLAN ID pools are defined with a starting value and a size of the VLAN pool. A VLAN pool can be attached to an access domain. During the deployment of an Ethernet service, VLAN IDs can be autoallocated from the access domain's pre-existing VLAN pools. When you deploy a new service, Prime Provisioning changes the status of the VLAN pool from Available to Allocated. Autoallocation gives the service provider tighter control of VLAN ID allocation.

You can also allocate VLAN IDs manually.

**Note**

When you are setting a manual VLAN ID on a Prime Provisioning service, Prime Provisioning warns you if the VLAN ID is outside the valid range of the defined VLAN pool. If so, Prime Provisioning does not include the manually defined VLAN ID in the VLAN pool. We recommend that you preset the range of the VLAN pool to include the range of any VLAN IDs that you manually assign.

Create one VLAN pool per access domain. Within that VLAN pool, you can define multiple ranges.

Before you begin, be sure that you:

- Know each VLAN pool start number.
- Know each VLAN pool size.
- Have created an access domain for the VLAN pool.
- Know the name of the access domain to which each VLAN pool will be allocated.

To have Prime Provisioning automatically assign a VLAN to the links, perform the following steps.

-
- Step 1** Choose **Service Design > Resource Pools**.
The Resource Pools window appears.
- Step 2** Choose **VLAN** from the **Pool Type** drop-down list.
- Step 3** Click **Create**.
The Create New VLAN Resource Pool window appears.
- Step 4** Enter a VLAN Pool Start number.
- Step 5** Enter a VLAN Pool Size number.
- Step 6** If the correct access domain is not showing in the Access Domain field, click **Select** to the right of Access Domain field.
The Select Access Domain dialog box appears.
If the correct access domain is showing, continue with Step 9.
- Choose an Access Domain Name by clicking the button in the Select column to the left of that Access Domain.
 - Click **Select**. The updated Create New VLAN Resource Pool window appears.
- Step 7** Click **Save**.
The updated VLAN Resource Pool window appears.
-  **Note** The pool name is created automatically, using a combination of the provider name and the access domain name.
-  **Note** The Status field reads “Allocated” if you already filled in the Reserved VLANs information when you created the access domain. If you did not fill in the Reserved VLANs information when you created the access domain, the Status field reads “Available.” To allocate a VLAN pool, you must fill in the corresponding VLAN information by editing the access domain. (See [Creating Access Domains, page 3-10](#).) The VLAN pool status automatically sets to “Allocated” on the Resource Pools window when you save your work.
- Step 8** Repeat this procedure for each range you want to define within the VLAN.
-

Creating Inner and Outer VLAN Pools

An inner and outer VLAN pools are used in conjunction with the AutoPick Inner VLAN and AutoPick Outer VLAN attributes in EVC Ethernet and EVC ATM-Ethernet policies and services. For instructions on how to set up inner and outer VLAN pools, see the section [Resource Pools, page 2-43](#).

Creating a VC ID Pool

VC ID pools are defined with a starting value and a size of the VC ID pool. A given VC ID pool is not attached to any inventory object (a provider or customer). During deployment of an EVC service, the VC ID can be autoallocated from the same VC ID pool or you can set it manually.

**Note**

When you are setting a manual VC ID on a Prime Provisioning service, Prime Provisioning warns you if the VC ID is outside the valid range of the defined VC ID pool. If so, Prime Provisioning does not include the manually defined VC ID in the VC ID pool. We recommend that you preset the range of the VC ID pool to include the range of any VC IDs that you manually assign.

Create one VC ID pool per network.

In a VPLS instance, all N-PE routers use the same VC ID for establishing emulated Virtual Circuits (VCs). The VC-ID is also called the VPN ID in the context of the VPLS VPN. (Multiple attachment circuits must be joined by the provider core in a VPLS instance. The provider core must simulate a virtual bridge that connects the multiple attachment circuits. To simulate this virtual bridge, all N-PE routers participating in a VPLS instance form emulated VCs among them.)

**Note**

VC ID is a 32-bit unique identifier that identifies a circuit/port.

Before you begin, be sure that you have the following information for each VC ID pool you must create:

- The VC Pool start number
- The VC Pool size

For EVC services, perform the following steps.

Step 1 Choose **Service Design > Resource Pools**.

The Resource Pools window appears.

Step 2 Choose **VC ID** from the **Pool Type** drop-down list.

Because this pool is a global pool, it is not associated with any other object.

Step 3 Click **Create**.

The Create New VC ID Resource Pool window appears.

Step 4 Enter a VC pool start number.

Step 5 Enter a VC pool size number.

Step 6 Click **Save**.

The updated Resource Pools window appears.

Creating Named Physical Circuits

Before creating an EVC service request, you must predefine the physical links between CEs and PEs. The Named Physical Circuit (NPC) represents a link going through a group of physical ports. Thus, more than one logical link can be provisioned on the same NPC; therefore, the NPC is defined once but used during several EVC service request creations.

There are two ways to create the NPC links:

- Through an NPC GUI editor. For details on how to do this, see [Creating NPCs Through the NPC GUI Editor, page 3-13](#).

- Through the autodiscovery process. For details on how to do this, see [Creating NPC Links Through the Autodiscovery Process, page 3-15](#).

An NPC definition must observe the following creation rules:

- An NPC must begin with a CE or an up-link of the device where UNI resides or a Ring.
- An NPC must end with an N-PE or a ring that ends in an N-PE.

If you are inserting NPC information for a link between a CE and UNI, you enter the information as:

- Source Device is the CE device.
- Source Interface is the CE port connecting to UNI.
- Destination Device is the UNI box.
- Destination interface is the UNI port.

If you are inserting NPC information for a CE not present case, you enter the information as:

- Source Device is the UNI box.
- Source Interface is the UP-LINK port, not the UNI port, on the UNI box connecting to the N-PE or another U-PE or PE-AGG.
- Destination Device is the U-PE, PE-AGG, or N-PE.
- Destination Interface is the DOWN-LINK port connecting to the N-PE or another U-PE or PE-AGG.

If you have a single N-PE and no CE (no U-PE and no CE), you do not have to create an NPC since there is no physical link that needs to be presented.

If an NPC involves two or more links (three or more devices), for example, it connects encl1, enpe1, and enpe12, you can construct this NPC as follows:

- Build the link that connects two ends: mlce1 and mlpe4.
- Insert a device (enpe12) to the link you just made.

Creating NPCs Through the NPC GUI Editor

To create NPCs through the NPC GUI editor, perform the following steps.

Step 1 Choose **Inventory > Named Physical Circuits**.

The Named Physical Circuits window appears.

To create a new NPC, you choose a CE as the beginning of the link and a N-PE as the end. If more than two devices are in a link, you can add or insert more devices (or a ring) to the NPC.



Note

The new device or ring added is always placed after the device selected, while a new device or ring inserted is placed before the device selected.

Each line on the Point-to-Point Editor represents a physical link. Each physical link has five attributes:

- **Source Device**
- **Source Interface**
- **Destination Device** (must be an N-PE)
- **Destination Interface**
- **Ring**

**Note**

Before adding or inserting a ring in an NPC, you must create a ring and save it in the repository. To obtain information on creating NPC rings, see [Setting Up Logical Inventory, page 2-53](#).

Source Device is the beginning of the link and **Destination Device** is the end of the link.

Step 2 Click **Create**.

The Create Named Physical Circuits window appears.

Step 3 Click **Add Device**.

The Select a Device window appears.

Step 4 Choose a CE as the beginning of the link.**Step 5** Click **Select**.

The device appears in the Create a Named Physical Circuits window.

Step 6 To insert another device or a ring, click **Insert Device** or **Insert Ring**.

To add another device or ring to the NPC, click **Add Device** or **Add Ring**. For this example, click **Add Device** to add the N-PE.

Step 7 Choose a PE as the destination device.**Step 8** Click **Select**.

The device appears.

Step 9 In the Outgoing Interface column, click **Select outgoing interface**.

A list of interfaces defined for the device appears.

Step 10 Choose an interface from the list and click **Select**.**Step 11** Click **Save**.

The Create Named Physical Circuits window now displays the NPC that you created.

Creating a Ring-Only NPC

To create an NPC that contains only a ring without specifying a CE, perform the following steps.

Step 1 Choose **Inventory > Named Physical Circuits**.**Step 2** Click **Create**.

The Create Named Physical Circuits window appears.

Step 3 Click **Add Ring**.

The Select NPC Ring window appears.

Step 4 Choose a ring and click **Select**. The ring appears.**Step 5** Click the **Select device** link to select the beginning of the ring.

A window appears showing a list of devices.

Step 6 Choose the device that is the beginning of the ring and click **Select**.**Step 7** Click the **Select device** link to choose the end of the ring.

Step 8 Choose the device that is the end of the ring and click **Select**.



Note The device that is the end of the ring in a ring-only NPC must be an N-PE.

Step 9 The Named Physical Circuits window appears showing the Ring-Only NPC.

Step 10 Click **Save** to save the NPC to the repository.

Terminating an Access Ring on Two N-PEs

Prime Provisioning supports device-level redundancy in the service topology to provide a failover in case one access link should drop. This is accomplished through a special use of an NPC ring that allows an access link to terminate at two different N-PE devices. The N-PEs in the ring are connected by a logical link using loopback interfaces on the N-PEs. The redundant link starts from a U-PE device and may, optionally, include PE-AGG devices.

For details on how to implement this in Prime Provisioning, see [Appendix B, “Terminating an Access Ring on Two N-PEs.”](#)

Creating NPC Links Through the Autodiscovery Process

With autodiscovery, the existing connectivity of network devices can be automatically retrieved and stored in the Prime Provisioning database. NPCs are further abstracted from the discovered connectivity.

For detailed steps to create NPCs using autodiscovery, see [Setting Up Logical Inventory, page 2-53](#).

Creating and Modifying Pseudowire Classes

The pseudowire class feature provides you with the capability to configure various attributes associated with a pseudowire that is deployed as part of an L2VPN service request.



Note The pseudowire class feature is supported on both IOS and IOS XR devices. For IOS XR devices, the pseudowire class feature is supported on IOS XR version 3.6.1 and higher.

The pseudowire class feature supports configuration of the encapsulation, transport mode, fallback options, and selection of a traffic engineering tunnel down which the pseudowire can be directed. For tunnel selection, you can select the tunnel using the Prime Provisioning Traffic Engineering Management (TEM) application, if it is being used. Otherwise, you can specify the identifier of a tunnel that is already provisioned within the network. The pseudowire class is a separately defined object in the Prime Provisioning repository that can be attached to an L2VPN service policy or service request.

This section describes how to create and modify pseudowire classes. For information on how the pseudowire class is used in policies and service requests, see later sections of this guide on setting attributes for specific services.

Creating a Pseudowire Class

To create a pseudowire class, perform the following steps.

Step 1 Choose **Inventory > Pseudowire Class**.

The Pseudowire Class window appears.

Step 2 Click the **Create** button.

The Create Pseudowire Class window appears.

Step 3 In the **Name** field, enter a valid PseudoWireClass name.

- The pseudowire class name is used for provisioning **pw-class** commands on the IOS or IOS XR device.
- Follow the below naming conventions while entering the PseudoWireClass name:
 - The name should not exceed 32 characters.
 - It should not contain spaces.
 - It should not contain any special characters except underscore.

Step 4 In the **Description** field, enter a meaningful description of less than 128 characters.

This field is optional.

Step 5 Check the **Control Word** check box to enable dynamic pseudowire connection.

Step 6 Choose the **MPLS** encapsulation type from the **Encapsulation** drop-down list.



Note Currently, the only encapsulation type supported is MPLS.

Step 7 Choose the transport mode from the **TransportMode** drop-down list. The choices are:

- **NONE** (default)
- **Vlan**
- **Ethernet**



Note If you want to set the TransportMode to Vlan, we recommend you do this via a pseudowire class, if supported by the version of IOS or IOS XR being used. If pseudowire class is not supported in a particular version of IOS or IOS XR, then you must set the TransportMode using a Dynamic Component Properties Library (DCPL) property, as explained in the section [Configuring the Transport Mode When Pseudowire Classes are Not Supported, page 3-18](#).

Step 8 Choose the protocol from the **Protocol** drop-down list. The choices are:

- **NONE** (default)
- **LDP**—Configures LDP as the signaling protocol for this pseudowire class.

Step 9 To configure sequencing on receive or transmit, choose a selection from the **Sequencing** drop-down list. The choices are:

- **NONE** (default)
- **BOTH**—Configures sequencing on receive and transmit.
- **TRANSMIT**—Configures sequencing on transmit.
- **RECEIVE**—Configures sequencing on receive.

Step 10 To determine the MPLS-TP or MPLS-TE tunnel path used by the pseudowire, click the **Tunnel Type** radio button.

- **NONE** (default)—User need not provide the Tunnel ID value.
- **TE**—User need to provide the Tunnel ID value.
- **TP**—User need to provide the Tunnel ID value.

Step 11 Enter a **Tunnel ID** of a TE tunnel that has already been provisioned by Prime Provisioning or that has been manually provisioned on the device.

This value is optional. You can also select a TE tunnel that has already been provisioned by Prime Provisioning, as covered in the next step.

Step 12 Click **Select TE Tunnel** if you want to select a TE tunnel that has been previously provisioned by Prime Provisioning.

The Select TE Tunnel pop-up window appears. Choose a TE tunnel and click **Select**. This populates the TE Tunnel field with the ID of the selected TE tunnel.



Note After a TE tunnel is associated to a pseudowire class or provisioned in a service request, you will receive an error message if you try to delete the TE tunnel using the Traffic Engineering Management (TEM) application. TE tunnels associated with a pseudowire class or service request cannot be deleted.

Step 13 Check the **Disable Fallback** check box to disable the fallback option for the pseudowire tunnel.

Choose this option based on your version of IOS or IOS XR. It is required for IOS XR 3.6.1 and optional for IOS XR 3.7 and above.

Modifying a Pseudowire Class

To modify (edit) a pseudowire class, perform the following steps.

Step 1 Choose **Inventory > Pseudowire Class**.

The Pseudowire Class window appears.

Step 2 Select the pseudowire class object you want to modify, and click **Edit**.

The Pseudowire Class Edit window appears.

Step 3 Make the desired changes and click **Save**.



Note The Name field is not editable if the pseudowire class is associated with any service requests.

If the pseudowire class being modified is associated with any service requests, the Affected Jobs window appears, which displays a list of affected service requests



Note A list of affected service requests only appears if the Transport Mode, Tunnel ID, or Disable Fallback values are changed in the pseudowire class being modified.

Step 4 Click **Save** to update service requests associated with the modified pseudowire class.

The impacted service requests are moved to the Requested state.

- Step 5** Click **Save and Deploy** to update and deploy service requests associated with the modified pseudowire class.
- Deployment tasks are created for the impacted service requests that were previously in the Deployed state.
- Step 6** Click **Cancel** to discard changes made to the modified pseudowire class.
- In this case, no change of state occurs for any service requests associated with the pseudowire class.
-

Deleting a Pseudowire Class

To delete a Pseudowire class, perform the following steps.



Note A Pseudowire Class that is in use with a service request or policy cannot be deleted.

- Step 1** Choose **Inventory > Pseudowire Class**.
- The Pseudowire Classes window appears.
- Step 2** Check the check box(es) next to the pseudowire class(es) you want to delete.
- Step 3** Click the **Delete** button and a window appears with the selected pseudowire class name.
- Step 4** Click the **Delete** button to confirm that you want to delete the specified pseudowire class(es).
- Step 5** Click **Cancel** if you want to return without deleting the selected pseudowire class(es).
-

Configuring the Transport Mode When Pseudowire Classes are Not Supported

This section describes how to configure the pseudowire transport mode to be of type Vlan for versions of IOS or IOS XR that do not support pseudowire classes. This is done through setting a Dynamic Component Properties Library (DCPL) property. See the usage notes following the steps for additional information.

Perform the following steps.

- Step 1** In Prime Provisioning, navigate to **Administration > Hosts**.
- Step 2** Check a check box for a specific host and click the **Config** button.
- Step 3** Navigate to the DCPL property **Services\Common\pseudoWireVlanMode**.
- Step 4** Set the property to **true**.
- Step 5** Click **Set Property**.
- Prime Provisioning then generates VLAN transport mode configuration for the pseudowire.
-

Usage notes:

- To set the transport mode to Vlan, it is recommended that you do this via a pseudowire class, if supported by the version of IOS or IOS XR being used. If the pseudowire class feature is not supported, then the transport mode must be set using a DCPL property, as explained in the steps of this section
- The DCPL property `pseudoWireVlanMode` only sets the default value for `PseudoWireClass TransportMode` as Vlan if the DCPL property is set to true. Users can always over ride it.
- The DCPL property `pseudoWireVlanMode` acts in a dual way:
 - It sets a default value for `PseudoWireClass TransportMode` to Vlan.
 - In the absence of a pseudowire class, it generates a deprecated command **transport-mode vlan**. The **transport-mode vlan** command is a deprecated command in IOS XR 3.6 and later. Thus, when a pseudowire class is selected for an IOS XR device and the DCPL property is also set to true, the **transport-mode vlan** command is not generated. Pseudowire class and the **transport-mode vlan** command do not co-exist. If a pseudowire class is present, it takes precedence over the deprecated **transport-mode vlan** command.
- The value of the DCPL property `pseudoWireVlanMode` should not be changed during the life of a service request.

Defining L2VPN Group Names for IOS XR Devices

This section describes how to specify the available L2VPN group names for policies and service requests for IOS XR devices. The choices appear in a drop-down list of the L2VPN Group Name attribute in policies and service requests. The name chosen is used for provisioning the L2VPN group name on IOS XR devices. The choices are defined through setting a Dynamic Component Properties Library (DCPL) property.

Perform the following steps.

-
- | | |
|---------------|--|
| Step 1 | In Prime Provisioning, navigate to Administration > Hosts . |
| Step 2 | Check a check box for a specific host and click the Config button. |
| Step 3 | Navigate to the DCPL property Services\Common\l2vpnGroupNameOptions . |
| Step 4 | Enter a comma-separated list of L2VPN group names in the New Value field. |
| Step 5 | Click Set Property . |
-

Creating an EVC Ethernet Policy

This section contains an overview of EVC support in Cisco Prime Provisioning 6.8, as well as the basic steps to create an EVC Ethernet policy. It contains the following subsections:

- [Overview, page 3-20](#)
- [Defining the EVC Ethernet Policy, page 3-20](#)

**Note**

For Ethernet (E-Line and E-LAN) services, use of the EVC policy and service request is recommended. If you are provisioning services using the EVC syntax, or plan to do so in the future, use the EVC service. Existing services that have been provisioned using the L2VPN and VPLS service policy types are still supported and can be maintained with those service types. For ATM and FRoMPLS services, use the L2VPN service policy, as before.

Overview

You must define an EVC Ethernet policy before you can provision a service. A policy can be shared by one or more service requests that have similar service requirements. A policy is a template of most of the parameters needed to define an EVC service request. After you define it, an EVC policy can be used by all the EVC service requests that share a common set of characteristics. You create a new EVC policy whenever you create a new type of service or a service with different parameters. EVC policy creation is normally performed by experienced network engineers.

An Editable check box in for an attribute in the policy gives the network operator the option of making a field editable. If the value is set to editable, the service request creator can change the value(s) of the particular policy attribute. If the value is *not* set to editable, the service request creator cannot change the attribute.

You can also associate Prime Provisioning templates and data files with a policy. See [Chapter 11, “Managing Templates and Data Files”](#) for more about using templates and data files in policies.

It is also possible to create user-defined attributes within a policy (and service requests based on the policy). For background information on how to use the additional information feature, see [Appendix D, “Adding Additional Information to Services.”](#)

For information on creating EVC Ethernet service requests, see [Managing an EVC Ethernet Service Request, page 3-22](#).

**Note**

For a general overview of EVC support in Prime Provisioning, see the chapter “Layer 2 Concepts” in the [Cisco Prime Provisioning 6.8 Administration Guide](#).

Defining the EVC Ethernet Policy

To define an EVC Ethernet policy, perform the following steps.

-
- Step 1** Choose **Service Design > Create Policy**.
The Policy Editor window appears.
- Step 2** Choose **EVC** from the Policy Type drop-down list.
The Policy Editor window appears.
- Step 3** Enter a **Policy Name** for the EVC policy.
- Step 4** Choose the **Policy Owner** for the EVC policy.
There are three types of EVC policy ownership:
- Customer ownership
 - Provider ownership

- Global ownership—Any service operator can make use of this policy.

This ownership has relevance when the Prime Provisioning Role-Based Access Control (RBAC) comes into play. For example, an EVC policy that is customer-owned can only be seen by operators who are allowed to work on this customer-owned policy. Similarly, operators who are allowed to work on a provider's network can view, use, and deploy a particular provider-owned policy.

Step 5 Click **Select** to choose the owner of the EVC policy.

The policy owner was established when you created customers or providers during Prime Provisioning setup. If the ownership is global, the Select function does not appear.

Step 6 Choose the **Policy Type**.

The choices are:

- **ETHERNET**—This section.
- **ATM**—See [Creating an ATM Policy, page 5-4](#).
- **ATM Ethernet Interworking**—See [Creating an EVC ATM-Ethernet Interworking Policy, page 3-31](#).
- **TDM Circuit Emulation**—See [Creating a TDM-CEM Policy, page 4-7](#).

Step 7 Click **Next**.

The Service Options window appears.

Step 8 Set the attributes in the Service Options window as described in [Service Options Window, page 3-56](#).

Step 9 When you have set the attributes, click **Next**.

The EVC Attributes window appears.

Step 10 Set the attributes in the EVC Attributes window as described in [EVC Attributes Window, page 3-61](#).

Step 11 When you have set the attributes, click **Next**.

The Interface Attributes window appears.

Step 12 Set the attributes in the Interface Attributes window as described in [Interface Attributes Window, page 3-67](#).

Step 13 When you have set the attributes, click **Next** to proceed to the next window (or else click **Finish** to save the policy).

Step 14 If you would like to use user-defined attributes within this policy, click **Next** (before clicking **Finish**).

An additional window appears the policy workflow. This window allows you to create user-defined attributes within the policy (and service requests based on the policy). For background information on how to use the additional information feature, see [Appendix D, "Adding Additional Information to Services."](#) If you are not using this feature, click **Next** to proceed to the Template Association window, or else click **Finish** to save the policy.

Step 15 If you would like to enable template association for this policy, click **Next** (before clicking **Finish**).

The Template Association window appears. In this window, you can enable template support and, optionally, associate templates and data files with the policy. For instructions about associating templates with policies and how to use the features in this window, See [Chapter 11, "Managing Templates and Data Files"](#) for more information about using templates and data files. When you have completed setting up templates and data files for the policy, click **Finish** in the Template Association window to close it and return to the Policy Editor window.

Step 16 To save the EVC policy, click **Finish**.

To create a service request based on an EVC policy, see [Managing an EVC Ethernet Service Request, page 3-22](#).

Managing an EVC Ethernet Service Request

This section provides information on how to provision an EVC Ethernet service request. It contains the following subsections:

- [Overview, page 3-22](#)
- [Creating an EVC Service Request, page 3-23](#)
- [Using Templates and Data Files with an EVC Ethernet Service Request, page 3-30](#)
- [Saving the EVC Ethernet Service Request, page 3-30](#)
- [Modifying the EVC Ethernet Service Request, page 3-30](#)
- [Deploying the EVC Ethernet Service Request, page 3-31](#)

Overview

An EVC Ethernet service request allows you to configure interfaces on an N-PE to support the EVC features described in [Creating an EVC Ethernet Policy, page 3-19](#). To create an EVC service request, an EVC service policy must already be defined. Based on the predefined EVC policy, an operator creates an EVC service request and deploys the service. One or more templates can also be associated to the N-PE as part of the service request.

Creating an EVC Ethernet service request involves the following steps:

1. Choose an existing EVC Ethernet policy.
2. Choose a VPN.



Note When working with VPN objects in the context of EVC Ethernet policies and service requests, only the VPN name and customer attributes are relevant. Other VPN attributes related to MPLS and VPLS are ignored.

3. Specify a bridge domain configuration (if applicable).
4. Specify a service request description.
5. Specify automatic or manual allocation of the VC ID or VPLS VPN ID.
6. Add direct connect links (if applicable).
7. Add links with L2 access nodes (if applicable).
8. Choose the N-PE and UNI interface for links.
9. For links with L2 access nodes, choose a Named Physical Circuit (NPC) if more than one NPC exists from the N-PE or the UNI interface.
10. Edit the link attributes.
11. Modify the service request.
12. Save the service request.

For sample configlets for EVC Ethernet scenarios, see [Sample Configlets, page 3-120](#).

Creating an EVC Service Request

To create an EVC Ethernet service request, perform the following steps.

-
- Step 1** Choose **Operate > Service Request Manager**.
The Service Request Manager window appears.
- Step 2** Click **Create**.
The Service Request Editor window appears.
- Step 3** From the policy picker, choose an EVC policy from the policies previously created (see [Creating an EVC Ethernet Policy, page 3-19](#)).
The EVS Service Request editor window appears. This window enables you to specify options for the service request, as well as configure links. The options displayed in first section of the window change, depending on the MPLS Core Connectivity Type that was specified in the policy (pseudowire, VPLS, or local).
- Step 4** Set link attributes based on the MPLS Core Connectivity Type for the policy:
- [Table 3-7, “Pseudowire Core Connectivity Attributes,” on page 73](#)
 - [Table 3-8, “VPLS Core Connectivity Attributes,” on page 75](#)
 - [Table 3-9, “Local Core Connectivity Attributes,” on page 78](#)
- Step 5** Set up links to the N-PE as described in section [Setting up Links to the N-PE, page 3-24](#).
The following link types are covered:
- [Setting Direct Connect Links, page 3-24](#)
 - [Setting Links with L2 Access Nodes, page 3-25](#)
 - [Using Templates and Data Files with an EVC Ethernet Service Request, page 3-30](#)
- After you have set up links, return to this section and perform the following steps to finishing creating the service request.
- Step 6** If you are using templates and data files with the service request, follow the guidelines in section [Using Templates and Data Files with an EVC Ethernet Service Request, page 3-30](#).
- Step 7** When you have completed setting the attributes in the EVC Service Request Editor window, click the **Save** button to save the settings and create the EVC service request.
If any attributes are missing or incorrectly set, Prime Provisioning displays a warning in the lower left of the window. Make any corrections or updates needed (based on the information provided by Prime Provisioning), and click the **Save** button.
- Step 8** If you are ready to deploy the EVC Ethernet service request, see [Deploying Service Requests, page 10-9](#).
-

For additional information on working with EVC service requests, see the following sections:

- [Using Templates and Data Files with an EVC Ethernet Service Request, page 3-30](#).
- [Saving the EVC Ethernet Service Request, page 3-30](#).
- [Modifying the EVC Ethernet Service Request, page 3-30](#)
- [Deploying the EVC Ethernet Service Request, page 3-31](#).

Setting up Links to the N-PE

The lower two sections of the EVC Service Request Editor window allow you to set up and configure links to the N-PE(s). See the appropriate section, depending on which type of link you are setting up:

- [Setting Direct Connect Links, page 3-24](#)
- [Setting Links with L2 Access Nodes, page 3-25](#)
- [Configuring Multi-segment Pseudowires, page 3-26](#)
- [Setting Up Pseudowire Redundancy and a Backup Peers, page 3-28](#)
- [Setting VPLS Neighbor Links \(VPLS only\), page 3-29](#)



Note

Many of the steps for setting up the link types are the same. The basic workflow for setting up links, as well as the attributes to be set, are presented in the section [Setting Direct Connect Links, page 3-24](#). Even if you are setting up links with L2 access nodes, it will be helpful to refer to the information presented in that section, as the section on L2 access nodes only covers the unique steps for such links.

Setting Direct Connect Links

For direct connect links, the CE is directly connected to the N-PE, with no intermediate L2 access nodes. No NPC are involved.

To set up the direct connect links, perform the following steps.

-
- Step 1** Click **Add** to add a link.
- A new numbered row for the link attributes appears.
- Step 2** To select the PE device for the link, click the toggle button in the **Select Device** field in N-PE column.
- The Device Selection window appears. This window displays the list of currently defined PEs, including Device Name, Provider Name, and PE Region Name for each device. The Quick Filter option allows you to type in strings in filter fields to narrow the list of devices.
- Step 3** Choose the PE device for the link by clicking the radio button next to the device name.
- The EVC Service Request Editor window reappears displaying the name of the selected PE in the N-PE column.
- Step 4** To choose the UNI interface, click on the toggle button in the **Select One** field of the UNI column.
- The Direct Link Interface Selection window appears. This window displays the available interfaces for the service based on the configuration of the underlying interfaces, existing service requests that might be using the interface, and the customer associated with the service request.
- When the UNI is configured on an N-PE device running IOS XR, the Standard UNI Port attribute is not supported. All the CLIs related to Standard UNI Port and UNI Port Security are ignored in this case.
- Step 5** Choose the UNI interface by clicking the radio button next to the interface name.
- Step 6** Check the **EVC** check box to mark the link for configuring service instance for the links.
- The EVC check box is mentioned at this stage because the setting of the check box alters the behavior of the link editing function available in the Link Attributes column. This is covered in the next steps.
 - The EVC check box is unchecked by default. The default value for the check box can be changed by setting the value of the DCPL property Provisioning\ProvDrv\CheckFlexUniCheckBox.

Step 7 Click **Edit** in the Link Attributes column to specify the UNI attributes.

The next steps document the use of the **Edit** link in the Link Attributes column. (In the case where the link attributes have already been set, this link changes from **Edit** to **Change**.) The link editing workflow changes depending on the status of the EVC check box for the link. If the EVC check box is checked, the editing workflow involves setting attributes in two windows, for two sets of link attributes: Service Instance Details and Standard UNI Details. If the EVC check box for the link is not checked, only the Standard UNI Details window is presented.

Step 8 If applicable, set the attributes in the Service Instance Details window as described in [Table 3-10](#).



Note All of the fields in the Service Instance Details screen are enabled based on the policy settings.

Step 9 Click **Next** to save the settings in the Service Instance Details window.

The Standard UNI Details window appears.

Step 10 If applicable, set the standard UNI link attributes as described in [Table 3-11](#).

- In the case of a link which is not set as an EVC link (by not checking the EVC check box in the EVC Service Request Editor window), editing the link attributes begins with this window.
- The attributes that appear in the Standard UNI Details window are dynamically configured by Prime Provisioning. Some of the attributes might not appear in the window, depending on the policy and service request settings or the link type. For example, if the MPLS core connectivity type of the EVC policy is VPLS or local, the pseudowire-related attributes will not appear. Also, setting the link as EVC or non-EVC will change the attributes that appear in the window. In addition, attributes are filtered based on device type (IOS or IOS XR). These and other cases are noted in [Table 3-11](#).

Step 11 Click **OK** to save the Standard UNI settings and return to the EVC SR window.

The value in the Link Attributes column now displays as “Changed,” signifying that the link settings have been updated. You can edit the link attributes now or at a future time by clicking on the Changed link and modifying the settings in the Standard UNI Details window.

Step 12 To add another link click the **Add** button and set the attributes for the new link as in the previous steps in this section.

Step 13 To delete a link, check the check box in the first column of the row for that link and click the **Delete** button.

Step 14 To complete the EVC Ethernet service request, see steps presented in [Creating an EVC Service Request, page 3-23](#).

Setting Links with L2 Access Nodes

The Links with L2 Access Nodes section of the EVC Service Request Editor window allows you to set up links with L2 (Ethernet) access nodes. These are similar to direct connect links, except that they have L2/Ethernet access nodes beyond the N-PE (towards the CE). Therefore, NPCs are involved. The steps for setting up links with L2 access nodes are similar to those covered in the section [Setting Direct Connect Links, page 3-24](#). The main difference in setting up links with L2 access does is specifying the NPC details.

To set the NPC details for links with L2 access nodes, perform the following steps.

Step 1 The first step in the process of adding a link using NPCs is selecting the U-PE/PE-AGG device, rather than the N-PE.

If only one NPC exists for the chosen interface, that NPC is autopopulated in the Circuit Details column, and you need not choose it explicitly.

If more than one NPC is available, click **Select one circuit** in the Circuit Selection column. The NPC window appears, enabling you to choose the appropriate NPC.

Step 2 Click **OK**.

Each time you choose a PE and its interface, the NPC that was set up from this PE and interface is automatically displayed under **Circuit Selection**. This means that you do not have to further specify the PE to complete the link.

If you want to review the details of this NPC, click **Circuit Details** in the Circuit Details column. The NPC Details window appears and lists the circuit details for this NPC.

Step 3 For details about editing link attributes, adding or deleting links, or using the EVC check box, see the corresponding steps in the section [Setting Direct Connect Links, page 3-24](#).

The following points cover the use of the EVC (UNI) check box:

- The EVC (UNI) attribute is equivalent to the All L2 Access Links Default to EVC UNI attribute in the policy. When you enable the attribute in the policy, it is enabled in the service request.
- The EVC (UNI) attribute only appears in the Links with L2 Access Nodes section of the EVC Service Request Editor window, in which you may have “n” number of U-PE and PE-AGG devices using the link. The Direct Connect Links section does not have this check box because EVC syntax is supported by default on N-PE devices of direct connect links.
- An NPC link must be available on a U-PE or PE-AGG device/interface in order to use this feature.
- This feature is only supported with IOS running on the U-PE or PE-AGG device. IOS XR is not supported.
- When the EVC (UNI) check box is enabled and you click the Edit link, the Service Instance Details window appears. The EVC syntax-related attributes appear for the U-PE device as well as the N-PE device. The optimum number of attributes appear within the U-PE section. Attributes set in the U-PE section are not repeated in the N-PE section. Note that any VLAN matching criteria for the U-PE side are matched on the N-PE side also.
- For descriptions of attributes that appear in GUI when the EVC (UNI) check box is enabled, see [Table 3-10](#).

Step 4 To complete the EVC Ethernet service request, see steps presented in [Creating an EVC Service Request, page 3-23](#).

Configuring Multi-segment Pseudowires

This section describes how pseudowire classes may be used to configure multi-segment pseudowires in Prime Provisioning. This enables you to create and independently assign pseudowire classes at the endpoints of a multi-segment pseudowire. You can perform all of the configuration steps in EVC Service Request Editor window, as described in the steps below. Alternatively, you can create pseudowire classes independently of the EVC service request, and then as they are deployed on the device you can reuse them. This feature is available with EVC Ethernet service requests using MPLS core connectivity types of PSEUDOWIRE and VPLS. It is also available for EVC ATM and EVC TDM Circuit Emulation service requests.

**Note**

To use this feature, the attribute Configure Pseudowire Segment(s) must be enabled in the policy for the service request. For more information about this attribute, see the appropriate tables in the section [EVC Ethernet Policy Attributes, page 3-56](#).

The following steps provide an example showing the basic steps of how to configure multi-segment pseudowires.

-
- Step 1** Navigate to the EVC Service Request Editor window.
- Step 2** In the Direct Connect Links section of the window, add the N-PE devices between which you want to configure the pseudowire.
- In the EVC Pseudowires section of the window an EVC pseudowire appears in the Pseudowire column.
- Step 3** To configure the pseudowire, click the **Configure Pseudowire** link in the Pseudowire Configuration column.
- A dialog window appears in which you can view and configure the pseudowire. The window has four tabs:
- Calculated Path
 - Path Summary
 - Segment Configuration
 - Create Pseudowire Class
- It also provides a drop-down menu (in the lower left of the window) in which you can choose a (required) tunnel for the link.

**Note**

Internet Explorer 8 (IE8) will not show the calculated path graphically (as described in Creating an MPLS-TP Service Request) as IE8 offers no support for SVG display. However, a textual summary of the path can be used to review the path in IE8. IE9 (and other Prime Provisioning supported browsers) shows the calculated path graphically.

- Step 4** In the drop-down menu, choose one tunnel to be the required tunnel for the link.
- Note that you can add (or remove) path constraints by clicking the plus (or minus) icons to the right:
- **Required NE/Link**—Specify network elements or links that traffic must pass through for the path.
 - **Excluded NE/Link**—Specify network elements or links that traffic must pass through for the path.
- Step 5** Click the **Calculate** button to re-calculate the path.
- To do this, enter the path constraints then click **Calculate** to re-calculate the path. Once the path is decided, you can use the other tabs to configure it.
- Step 6** Click on the **Calculated Path** tab to view a diagram of the link.
- This displays a path diagram using the shortest path between the previously selected N-PEs.
- Step 7** Click on the **Path Summary** tab for a textual representation of the path.
- This can be used if the browser does not support the technology required to show the graphical path.
- Step 8** Click on the **Segment Configuration** tab to set configuration options on a per-segment basis.
- Perform the following steps:
- a. Check the radio button of the segment you want to configure.

- b. Use the **Pseudowire Class** drop-down menus to associate pseudowire classes to each end of the segment. The pseudowire classes must already exist. In order for the pseudowire classes to be valid, they must match up with the same core type and same tunnel number. Otherwise, you will not be able to choose the pseudowire class. In that case, you can leave the Pseudowire Class drop-down menu blank and if needed Prime Provisioning will autogenerate a pseudowire class with an autogenerated name on the device.

If the pseudowire class does not exist and you would like to create one, you can create it in-line using the Create Pseudowire Class tab as covered below.

- c. The **Segment Type** field is not selectable, but is autogenerated. Depending on the type of segment, this field displays one of the following: TP Tunnel, TE Tunnel, or LDP.
- d. Use the **MPLS Labels** drop-down to configure static or dynamic labels. This setting overrides the global settings, that is the value of the Static Pseudowire (AutoPick MPLS Labels) attribute previously set in the policy or service request.
- e. Once the configuration is set up on a segment, click the **Save** button below the segment information to save the settings for the segment.



Note Note that you cannot delete a TE tunnel if it is in use by an EVC service. Therefore, if you configure a multi-segment pseudowire to use a TE tunnel anywhere in the path of the multi-segment pseudowire, it will prevent that TE tunnel from being removed by Prime Provisioning.

- Step 9** If needed, click on the **Create Pseudowire Class** tab to create a pseudowire class in line during the configuration.

A Create Pseudowire Class window appears. The options in the window are similar to the top-level pseudowire creation operation available at **Inventory > Logical Inventory > Pseudowire Class**.

- a. Set the options for the pseudoewire class per your requirements.
- b. Click the **Create** button to create the pseudowire class.

Then you will be able to see and choose the new pseudowire class in the Pseudowire Class drop-down menu in the Segment Configuration tab.

- Step 10** Click the **Revert** button to revert the calculated path.

For example, in the case of a single segment, clicking the Revert button reverts the calculated path to reflect the pseudowire classes that are defined on the individual links. If you never open the Configure Pseudowire dialog, then you can still define pseudowire classes using each of the link attribute editors.

- Step 11** Click the **Save** button to save the configuration settings.

- Step 12** Click the **Close** button to close the dialog.

The dialog closes and you return to the EVC Service Request Editor window.

- Step 13** To complete the EVC Ethernet service request, see steps presented in [Creating an EVC Service Request, page 3-23](#).
-

Setting Up Pseudowire Redundancy and a Backup Peers

This section describes how to configure pseudowire redundancy and backup peers for EVC Ethernet services with a PSEUDOWIRE core type. This is done by designating links as A, Z, and Z-backup [Z' (prime)] links.

**Note**

You can add two direct connect links and one NPC circuit (derived from a Single Homed Ring) as the L2 access node. In this scenario, the L2 access node acts as the source node for the pseudowire and the direct links are the two distribution nodes (Z and Z' link). The Z' link associated with the direct connect link acts as the backup for the source device present in the L2 access node.

This feature is activated when the Pseudowire Redundancy check box is enabled in the EVC Service Request Editor window.

To configure pseudowire redundancy or set up a backup peer, perform the following steps.

Step 1 In the EVC Service Request Editor window, check the **Pseudo Wire Redundancy** check box to enable pseudowire redundancy.

Step 2 Add two N-PE devices in the Direct Connect Links section of the window.

Note that the first N-PE is designated as "A" in the Terminal column, while the second N-PE is marked as "Z".

You may also configure a third link as a backup peer, as follows.

Step 3 Add a third N-PE into the list of devices in the Direct Connect Links section.

The third N-PE is designated as "Z - Backup" in the Terminal column.

In the EVC Pseudowires section of the window, two pseudowires are listed. One is designated as the backup. Note the pseudowires are now between:

- First and second N-PE ("A" and "Z"), and
- First and third N-PE ("A" and "Z - Backup")

You can configure the pseudowires by clicking the **Configure Pseudowire** link to the right of the pseudowire name. The steps to do this are similar to those provided in the section [Configuring Multi-segment Pseudowires, page 3-26](#) (preceding section, above).

**Note**

Note that you cannot delete a TE tunnel if it is in use by an EVC service. Therefore, if you configure a multi-segment pseudowire to use a TE tunnel anywhere in the path of the multi-segment pseudowire, this prevents that TE tunnel from being removed by Prime Provisioning.

Setting VPLS Neighbor Links (VPLS only)

If a VPLS policy has been selected, the bottom window will show VPLS Neighbor Links. If you select two or more N-PEs under Direct Connect Links, you will be able to discover any VPLS enabled neighbors.

To choose the desired path in a Multisegment Pseudowire topology, do the following:

Step 1 Configure the pseudowire by clicking the **Configure Pseudowire** link under VPLS Neighbor Links.

**Note**

Pseudowires are configured not just for the links in this service request but for all links in the VPLS.

- Step 2** In the pop-up window, click the **Calculate Path** button.
- This displays a path diagram using the shortest path between the previously selected N-PEs. Any existing MPLS-TP tunnels between them will be given priority.
- Step 3** Add (or remove) path constraints by clicking the plus (or minus) icons to the right:
- **Required NE/Link**—Specify network elements or links that traffic must pass through for the path.
 - **Excluded NE/Link**—Specify network elements or links that traffic must *not* pass through for the path.
- Step 4** For additional details on using features in the pop-up window, see the previous section [Configuring Multi-segment Pseudowires, page 3-26](#).
- Step 5** To complete the EVC Ethernet service request, see steps presented in [Creating an EVC Service Request, page 3-23](#).
-

Using Templates and Data Files with an EVC Ethernet Service Request

The template mechanism in Prime Provisioning provides a way to add additional configuration information to a device configuration generated by a service request. To use the template mechanism, the policy on which the service request is based must have been set to enable templates. Optionally, templates and data files to be used by the service request can be specified in the policy. During service request creation, templates/data files can be added to a device configuration if the operator has the appropriate RBAC permission to do so.

See [Chapter 11, “Managing Templates and Data Files”](#) for more information about using templates and data files.

Saving the EVC Ethernet Service Request

To save an EVC Ethernet service request, perform the following steps.

- Step 1** When you have finished setting the attributes for the EVC Ethernet service request, click **Save** to create the service request.
- If the EVC service request is successfully created, you will see the Service Request Manager window. The newly created EVC Ethernet service request is added with the state of REQUESTED.
- Step 2** If, however, the EVC Ethernet service request creation failed for some reason (for example, a value chosen is out of bounds), you are warned with an error message.
- In such a case, you should correct the error and save the service request again.
-

Modifying the EVC Ethernet Service Request

You can modify an EVC service request if you must change or modify the links or other settings of the service request.

To modify an EVC service request, perform the following steps.

-
- Step 1** Choose **Operate > Service Request Manager**.
- The Service Request Manager window appears, showing service requests available in Prime Provisioning.
- Step 2** Check a check box for a service request.
- Step 3** Click **Edit**.
- EVC Service Request Editor window appears.
- Step 4** Modify any of the attributes, as desired.
- See the sections starting with “[Creating an EVC Service Request](#)” section on page 3-23 for detailed coverage of setting attributes in this window.
-  **Note** Once the VC ID, VPLS VPN ID, and VLAN ID have been set in a service request they cannot be modified.
-
- Step 5** To add a template/data file to an attachment circuit, see the section [Saving the EVC Ethernet Service Request, page 3-30](#).
- Step 6** When you are finished editing the EVC service request, click **Save**.
- For additional information about saving an EVC service request, see [Saving the EVC Ethernet Service Request, page 3-30](#).
-

Deploying the EVC Ethernet Service Request

You can deploy an EVC Ethernet service in two different ways:

- If a service request has been saved, you may deploy it through the Service Request Manager window (choose **Operate > Service Request Manager**). For steps on how to do this, see [Chapter 10, “Managing Service Requests.”](#)
- Alternatively, you can deploy an EVC Ethernet service request from within the Service Request Editor window (while creating the service request). The Deploy button at the bottom of the window allows you to save and deploy the service request in one step.

Creating an EVC ATM-Ethernet Interworking Policy

This section contains an overview of EVC ATM-Ethernet Interworking support in Prime Provisioning, as well as the basic steps to create an EVC ATM-Ethernet Interworking policy. It contains the following subsections:

- [Overview, page 3-20](#)
- [Defining the EVC Ethernet Policy, page 3-20](#)

**Note**

For Ethernet (E-Line and E-LAN) services, use of the EVC policy and service request is recommended. If you are provisioning services using the EVC syntax, or plan to do so in the future, use the EVC service. Existing services that have been provisioned using the L2VPN and VPLS service policy types are still supported and can be maintained with those service types. For ATM and FRoMPLS services, use the L2VPN service policy, as before.

Overview

You must define an EVC ATM-Ethernet Interworking policy before you can provision a service. A policy can be shared by one or more service requests that have similar service requirements.

A policy is a template of most of the parameters needed to define an EVC service request. After you define it, an EVC policy can be used by all the EVC service requests that share a common set of characteristics. You create a new EVC policy whenever you create a new type of service or a service with different parameters. EVC policy creation is normally performed by experienced network engineers.

An Editable check box in for an attribute in the policy gives the network operator the option of making a field editable. If the value is set to editable, the service request creator can change the value(s) of the particular policy attribute. If the value is *not* set to editable, the service request creator cannot change the attribute.

You can also associate Prime Provisioning templates and data files with a policy. See [Chapter 11, “Managing Templates and Data Files”](#) for more about using templates and data files in policies.

It is also possible to create user-defined attributes within a policy (and service requests based on the policy). For background information on how to use the additional information feature, see [Appendix D, “Adding Additional Information to Services.”](#)

For information on creating EVC ATM-Ethernet service requests, see [Managing an EVC ATM-Ethernet Interworking Service Request, page 3-34.](#)

Defining the EVC ATM-Ethernet Interworking Policy

To define an EVC ATM-Ethernet Interworking policy, perform the following steps.

Step 1 Choose **Service Design > Create Policy**.

The Policy Editor window appears.

Step 2 Choose **EVC** from the Policy Type drop-down list.

The Policy Editor window appears.

Step 3 Enter a **Policy Name** for the EVC ATM-Ethernet Interworking policy.**Step 4** Choose the **Policy Owner** for the EVC policy.

There are three types of EVC policy ownership:

- Customer ownership
- Provider ownership
- Global ownership—Any service operator can make use of this policy.

This ownership has relevance when the Prime Provisioning Role-Based Access Control (RBAC) comes into play. For example, an EVC policy that is customer-owned can only be seen by operators who are allowed to work on this customer-owned policy. Similarly, operators who are allowed to work on a provider's network can view, use, and deploy a particular provider-owned policy.

Step 5 Click **Select** to choose the owner of the EVC policy.

The policy owner was established when you created customers or providers during Prime Provisioning setup. If the ownership is global, the Select function does not appear.

Step 6 Choose the **Policy Type**.

The choices are:

- **ETHERNET**—See [Creating an EVC Ethernet Policy, page 3-19](#).
- **ATM**—See [Creating an ATM Policy, page 5-4](#).
- **ATM Ethernet Interworking**—This section.
- **TDM Circuit Emulation**—See [Creating a TDM-CEM Policy, page 4-7](#).



Note This section describes creating the ATM-Ethernet Interworking policy type. For information on using the EVC Ethernet policy type, see [Creating an EVC Ethernet Policy, page 3-19](#).

Step 7 Click **Next**.

The Service Options window appears.

Step 8 Set the attributes in the Service Options window as described in [Service Options Window, page 3-90](#).**Step 9** When you have set the attributes, click **Next**.

The ATM Interface Attribute window appears.

Step 10 Set the attributes in the ATM Interface Attribute window as described in [ATM Interface Attributes Window, page 3-94](#).**Step 11** When you have set the attributes, click **Next**.

The EVC Attributes window appears.

- Step 12** Set the attributes in the EVC Attributes window as described in [EVC Attributes Window, page 3-94](#).
- Step 13** When you have set the attributes, click **Next**.
The Interface Attribute window appears.
- Step 14** Set the attributes in the Interface Attributes window as described in [Interface Attributes Window, page 3-99](#).
- Step 15** When you have set the attributes, click **Next** to proceed to the next window (or else click **Finish** to save the policy).
- Step 16** If you would like to use user-defined attributes within this policy, click **Next** (before clicking **Finish**).
An additional window appears the policy workflow. This window allows you to create user-defined attributes within the policy (and service requests based on the policy). For background information on how to use the additional information feature, see [Appendix D, “Adding Additional Information to Services.”](#) If you are not using this feature, click **Next** to proceed to the Template Association window, or else click **Finish** to save the policy.
- Step 17** If you would like to enable template association for this policy, click **Next** (before clicking **Finish**).
The Template Association window appears. In this window, you can enable template support and, optionally, associate templates and data files with the policy. For instructions about associating templates with policies and how to use the features in this window, See [Chapter 11, “Managing Templates and Data Files”](#) for more information about using templates and data files. When you have completed setting up templates and data files for the policy, click **Finish** in the Template Association window to close it and return to the Policy Editor window.
- Step 18** To save the EVC ATM-Ethernet Interworking policy, click **Finish**.

To create a service request based on an EVC policy, see [Managing an EVC Ethernet Service Request, page 3-22](#).

Customizing EVC and MPLS Policies

For instructions in how to use this feature, see [Chapter 8, “Customizing EVC, MPLS and MPLS-TP Policies”](#).

Managing an EVC ATM-Ethernet Interworking Service Request

This section provides information on how to provision an EVC ATM-Ethernet Interworking service request. It contains the following subsections:

- [Overview, page 3-35](#)
- [Creating an EVC ATM-Ethernet Interworking Service Request, page 3-35](#)
- [Using Templates and Data Files with an EVC ATM-Interworking Service Request, page 3-40](#)
- [Saving the EVC ATM-Interworking Service Request, page 3-41](#)
- [Modifying the EVC ATM-Interworking Service Request, page 3-41](#)
- [Deploying the EVC ATM-Ethernet Service Request, page 3-42](#)

Overview

An EVC ATM-Ethernet Interworking service request allows you to configure interfaces on an N-PE to support the EVC features described in [Creating an EVC ATM-Ethernet Interworking Policy, page 3-31](#). To create an EVC ATM-Ethernet Interworking service request, an EVC ATM-Ethernet Interworking service policy must already be defined. Based on the predefined EVC policy, an operator creates an EVC service request, with or without modifications to the policy, and deploys the service. One or more templates can also be associated to the N-PE as part of the service request.

ATM-Ethernet interworking is supported through the following configurations:

- ATM Transport Mode (VC)
 - ATM-Ethernet Pseudowire
 - ATM-ATM Local connect
 - ATM-Ethernet Local connect
- ATM Transport Mode (VP)
 - ATM-ATM Local connect

The following steps are involved in creating an EVC ATM-Ethernet Interworking service request:

1. Choose an existing EVC ATM-Ethernet Interworking policy.
2. Choose a VPN.



Note When working with VPN objects in the context of EVC policies and service requests, only the VPN name and customer attributes are relevant. Other VPN attributes related to MPLS and VPLS are ignored.

3. Specify a bridge domain configuration (if applicable).
4. Specify a service request description.
5. Specify automatic or manual allocation of the VC ID or VPLS VPN ID.
6. Add direct connect links (if applicable).
7. Add links with L2 access nodes (if applicable).
8. Choose the N-PE and UNI interface for links.
9. For links with L2 access nodes, choose a Named Physical Circuit (NPC) if more than one NPC exists from the N-PE or the UNI interface.
10. Edit the link attributes.
11. Modify the service request.
12. Save the service request.

For sample configlets for EVC ATM-Ethernet Interworking scenarios, see [Sample Configlets, page 3-120](#).

Creating an EVC ATM-Ethernet Interworking Service Request

To create an EVC ATM-Ethernet Interworking service request, perform the following steps.

-
- Step 1** Choose **Operate > Service Request Manager**.
The Service Request Manager window appears.
- Step 2** Click **Create**.
The Service Request Editor window appears.
- Step 3** From the policy picker, choose an EVC ATM-Ethernet Interworking policy from the policies previously created (see [Creating an EVC ATM-Ethernet Interworking Policy, page 3-31](#)).
The EVC Service Request Editor window appears. The new service request inherits all the properties of the chosen EVC ATM-Ethernet Interworking policy, such as all the editable and non-editable features and pre-set parameters.
- Step 4** Set link attributes based on the MPLS Core Connectivity Type for the policy as described in the following tables:
- [Table 3-18, “Pseudowire Core Connectivity Attributes,” on page 105.](#)
 - [Table 3-19, “Local Core Connectivity Attributes,” on page 107.](#)
- Step 5** Set up links to the N-PE as described in section [Setting up Links to the N-PE, page 3-36](#).
The following link types are covered:
- [Setting Direct Connect Links, page 3-37](#)
 - [Setting the ATM Link Attributes, page 3-38](#)
 - [Setting Links with L2 Access Nodes, page 3-39](#)
- After you have set up links, return to this section and perform the following steps to finishing creating the service request.
- Step 6** If you are using templates and data files with the service request, follow the guidelines in section [Using Templates and Data Files with an EVC ATM-Interworking Service Request, page 3-40](#).
- Step 7** When you have completed setting the attributes in the EVC Service Request Editor window, click the **Save** button to save the settings and create the EVC service request.
If any attributes are missing or incorrectly set, Prime Provisioning displays a warning in the lower left of the window. Make any corrections or updates needed (based on the information provided by Prime Provisioning), and click the **Save** button.
- Step 8** If you are ready to deploy the EVC Ethernet service request, see [Managing Service Requests, page 10-1](#).
-

For additional information on working with EVC service requests, see the following sections:

- [Using Templates and Data Files with an EVC ATM-Interworking Service Request, page 3-40.](#)
- [Saving the EVC ATM-Interworking Service Request, page 3-41.](#)
- [Modifying the EVC ATM-Interworking Service Request, page 3-41](#)
- [Deploying the EVC ATM-Ethernet Service Request, page 3-42.](#)

Setting up Links to the N-PE

The lower two sections of the EVC Service Request Editor window allow you to set up links to the N-PE. See the appropriate section, depending on which type of link you are setting up:

- [Setting Direct Connect Links, page 3-37](#). The Direct Connect Links section of the window is where you set up links that directly connect to the N-PE. No NPCs are involved. ATM links are supported for direct connect links. For details on ATM links, see [Setting the ATM Link Attributes, page 3-38](#).
- [Setting Links with L2 Access Nodes, page 3-39](#). The Links with L2 Access Nodes section is where you set up links with L2 (Ethernet) access nodes. NPCs are involved. ATM interfaces cannot be in L2 access nodes.

**Note**

Many of steps for setting up the two link types are the same. The basic workflow for setting up links, as well as the attributes to be set, are presented in the following section [Setting Direct Connect Links, page 3-37](#). Even if you are setting up links with L2 access nodes, it will be helpful to refer to the information presented in that section, as the section on L2 access nodes only covers the unique steps for such links.

Setting Direct Connect Links

For direct connect links, the CE is directly connected to the N-PE, with no intermediate L2 access nodes. The Direct Connect Links section of the window is where you set up links that directly connect to the N-PE. No NPCs are involved. ATM links are supported for direct connect links.

To set up the direct connect links, perform the following steps.

-
- Step 1** Click **Add** to add a link.
- A new numbered row for the link attributes appears.
- Step 2** To select the PE device for the link, click the toggle button in the **Select Device** field in N-PE column. The Device Selection window appears. This window displays the list of currently defined PEs, including Device Name, Provider Name, and PE Region Name for each device. The Quick Filter option allows you to type in strings in filter fields to narrow the list of devices.
- Step 3** Choose the PE device for the link by clicking the radio button next to the device name. The EVC Service Request Editor window reappears displaying the name of the selected PE in the N-PE column.
- Step 4** To choose the UNI interface, click on the toggle button in the **Select One** field of the UNI column. The Direct Link Interface Selection window appears. This window displays the available interfaces for the service based on the configuration of the underlying interfaces, existing service requests that might be using the interface, and the customer associated with the service request. When the UNI is configured on an N-PE device running IOS XR, the Standard UNI Port attribute is not supported. All the CLIs related to Standard UNI Port and UNI Port Security are ignored in this case.
- Step 5** Choose the UNI interface by clicking the radio button next to the interface name.
- Step 6** Check the **EVC check box** to mark the link for configuring service instance for the links.
- The EVC check box is mentioned at this stage because the setting of the check box alters the behavior of the link editing function available in the Link Attributes column. This is covered in the next steps.
 - The EVC check box is unchecked by default. The default value for the check box can be changed by setting the value of the DCPL property `Pr ovisioning\ProvDrv\CheckFlexUniCheckBox`.
- Step 7** Click **Edit** in the Link Attributes column to specify UNI attributes.

The next steps document the use of the **Edit** link in the Link Attributes column. (In the case where the link attributes have already been set, this link changes from **Edit** to **Change**.) The link editing workflow changes depending on the status of the EVC check box for the link. If the EVC check box is checked, the editing workflow involves setting attributes in two windows, for two sets of link attributes: Service Instance Details and Standard UNI Details. If the EVC check box for the link is not checked, only the Standard UNI Details window is presented.

**Note**

If you are setting up an ATM link (by choosing an ATM interface as the UNI on the N-PE device), there is a different workflow. The check box in the EVC column dynamically disappears, and clicking the Edit link in the link attributes column brings up the ATM-Ethernet Attributes window. For information on using this window to set up an ATM link, see [Setting the ATM Link Attributes, page 3-38](#).

- Step 8** Click **Edit** in the Link Attributes column to specify the UNI attributes.
- Step 9** If applicable, set the attributes in the Service Instance Details window as described in [Table 3-20](#).
- Step 10** Click **Next** to save the settings in the Service Instance Details window.
The Standard UNI Details window appears.
- Step 11** If applicable, set the standard UNI link attributes as described in [Table 3-21](#).
- In the case of a link which is not set as an EVC link (by not checking the EVC check box in the Service Request Details window), editing the link attributes begins with this window.
 - The attributes that appear in the Standard UNI Details window are dynamically configured by Prime Provisioning. Some of the attributes covered in the steps below might not appear in the window, depending on the policy and service request settings or the link type. For example, if the MPLS core connectivity type of the EVC policy is local, the pseudowire-related attributes will not appear. Also, setting the link as EVC or non-EVC will change the attributes that appear in the window. In addition, attributes are filtered based on device type (IOS or IOS XR). These cases are noted in the steps, for reference.
- Step 12** Click **OK** to save the Standard UNI settings and return to the EVC Service Request window.
The value in the Link Attributes column now displays as “Changed,” signifying that the link settings have been updated. You can edit the link attributes now or at a future time by clicking on the Changed link and modifying the settings in the Standard UNI Details window.
- Step 13** To add another link click the **Add** button and set the attributes for the new link as in the previous steps in this section.
- Step 14** To delete a link, check the check box in the first column of the row for that link and click the **Delete** button.
- Step 15** To complete the EVC ATM-Ethernet Interworking service request, see steps presented in [Creating an EVC ATM-Ethernet Interworking Service Request, page 3-35](#).

Setting the ATM Link Attributes

This section describes how to set up a direct connect link as an ATM link.

To set up the ATM link, perform the following steps.

- Step 1** In the Direct Connect Links section of the EVC Service Request Editor window, specify the device for which you would like to set up an ATM link.

Step 2 Choose an ATM interface for the UNI.



Note ATM interfaces are displayed in the interface picker in the UNI column only if the EVC service request is based on an ATM-Ethernet Interworking policy type.

When you choose an ATM interface, the check box in the EVC column dynamically disappears from the GUI.

Step 3 In the Link Attributes column, click the **Edit** link of the device on which you want to add an ATM link. The ATM UNI Details window appears. All of the fields in the ATM UNI Details window are enabled based on the policy settings.

Step 4 Set attributes in the ATM UNI Details window as described in [Table 3-22](#).

Step 5 Click **OK** to save the ATM UNI Details settings and return to the EVC Service Request Editor window. The value in the Link Attributes column now displays as “Changed,” signifying that the link settings have been updated. You can edit the link attributes now or at a future time by clicking on the Changed link and modifying the settings in the Standard UNI Details window.

See [Using Templates and Data Files with an EVC ATM-Interworking Service Request, page 3-40](#), for details on editing the link attributes.

Step 6 To add another link click the **Add** button and set the attributes for the new link as in the previous steps in this section.

Step 7 To delete a link, check the check box in the first column of the row for that link and click the **Delete** button.

Step 8 To complete the EVC ATM-Ethernet Interworking service request, see steps presented in [Creating an EVC ATM-Ethernet Interworking Service Request, page 3-35](#).

Setting Links with L2 Access Nodes

The Links with L2 Access Nodes section of the EVC Service Request Editor window allows you to set up links with L2 (Ethernet) access nodes. These are similar to direct connect links, except that they have L2/Ethernet access nodes beyond the N-PE (towards the CE). Therefore, NPCs are involved.



Note ATM links are not supported in L2 access nodes. ATM links must be set up as direct connect links. For more information, see [Setting the ATM Link Attributes, page 3-38](#).

The steps for setting up links with L2 access nodes are similar to those covered in the section [Setting Direct Connect Links, page 3-37](#). See that section for detailed steps on the following common operations:

- Adding and deleting links.
- Selecting the N-PE.
- Choosing the UNI interface.
- Setting the link as an EVC link.
- Editing the standard and EVC link attributes.

The main difference in setting up links with L2 access does is specifying the NPC details.

To set the NPC details for links with L2 access nodes, perform the following steps.

-
- Step 1** The first step in the process of adding a link using NPCs is selecting the U-PE/PE-AGG device, rather than the N-PE.
- If only one NPC exists for the chosen interface, that NPC is autopopulated in the Circuit Details column, and you need not choose it explicitly.
- If more than one NPC is available, click **Select one circuit** in the Circuit Selection column. The NPC window appears, enabling you to choose the appropriate NPC.
- Step 2** Click **OK**.
- Each time you choose a PE and its interface, the NPC that was set up from this PE and interface is automatically displayed under **Circuit Selection**. This means that you do not have to further specify the PE to complete the link.
- If you want to review the details of this NPC, click **Circuit Details** in the Circuit Details column. The NPC Details window appears and lists the circuit details for this NPC.
- Step 3** For details about editing link attributes, adding or deleting links, or using the EVC check box, see the corresponding steps in the section [Setting Direct Connect Links, page 3-37](#).
- The following points cover the use of the EVC (UNI) check box:
- The EVC (UNI) attribute is equivalent to the All L2 Access Links Default to EVC UNI attribute in the policy. When you enable the attribute in the policy, it is enabled in the service request.
 - The EVC (UNI) attribute only appears in the Links with L2 Access Nodes section of the EVC Service Request Editor window, in which you may have “n” number of U-PE and PE-AGG devices using the link. The Direct Connect Links section does not have this check box because EVC syntax is supported by default on N-PE devices of direct connect links.
 - An NPC link must be available on a U-PE or PE-AGG device/interface in order to use this feature.
 - This feature is only supported with IOS running on the U-PE or PE-AGG device. IOS XR is not supported.
 - When the EVC (UNI) check box is enabled and you click the Edit link, the Service Instance Details window appears. The EVC syntax-related attributes appear for the U-PE device as well as the N-PE device. The optimum number of attributes appear within the U-PE section. Attributes set in the U-PE section are not repeated in the N-PE section. Note that any VLAN matching criteria for the U-PE side are matched on the N-PE side also.
 - For descriptions of attributes that appear in GUI when the EVC (UNI) check box is enabled, see [Table 3-20](#).
- Step 4** To complete the EVC ATM-Ethernet Interworking service request, see steps presented in [Creating an EVC ATM-Ethernet Interworking Service Request, page 3-35](#).
-

Using Templates and Data Files with an EVC ATM-Interworking Service Request

The template mechanism in Prime Provisioning provides a way to add additional configuration information to a device configuration generated by a service request. To use the template mechanism, the policy on which the service request is based must have been set to enable templates. Optionally, templates and data files to be used by the service request can be specified in the policy. During service

request creation, templates/data files can be added to a device configuration if the operator has the appropriate RBAC permission to do so. See [Chapter 11, “Managing Templates and Data Files”](#) for more information about using templates and data files.

Saving the EVC ATM-Interworking Service Request

To save an EVC ATM-Interworking service request, perform the following steps.

-
- Step 1** When you have finished setting the attributes for the EVC ATM-Interworking service request, click **Save** to create the service request.
- If the EVC ATM-Interworking service request is successfully created, you will see the Service Request Manager window.
- The newly created EVC service request is added with the state of REQUESTED.
- Step 2** If, however, the EVC service request creation failed for some reason (for example, a value chosen is out of bounds), you are warned with an error message.
- In such a case, you should correct the error and save the service request again.
-

Modifying the EVC ATM-Interworking Service Request

You can modify an EVC ATM-Interworking service request if you must change or modify the links or other settings of the service request.

To modify an EVC ATM-Interworking service request, perform the following steps.

-
- Step 1** Choose **Operate > Service Request Manager**.
- The Service Request Manager window appears, showing service request available in Prime Provisioning.
- Step 2** Check a check box for a service request.
- Step 3** Click **Edit**.
- EVC Service Request Editor window appears.
- Step 4** Modify any of the attributes, as desired.
- See the sections start with [Creating an EVC ATM-Ethernet Interworking Service Request, page 3-35](#), for detailed coverage of setting attributes in this window.



Note Once the VC ID, VPLS VPN ID, and VLAN ID have been set in a service request they cannot be modified.

- Step 5** To add a template/data file to an attachment circuit, see the section [Using Templates and Data Files with an EVC ATM-Interworking Service Request, page 3-40](#).
- Step 6** When you are finished editing the EVC service request, click **Save**.

For additional information about saving an EVC service request, see [Saving the EVC ATM-Interworking Service Request, page 3-41](#).

Deploying the EVC ATM-Ethernet Service Request

You can deploy an EVC ATM-Ethernet service in two different ways:

- If a service request has been saved, you may deploy it through the Service Request Manager window (choose **Operate > Service Request Manager**). For steps on how to do this, see [Chapter 10, “Managing Service Requests.”](#)
- Alternatively, you can deploy an EVC ATM-Ethernet service request from within the Service Request Editor window (while creating the service request). The Deploy button at the bottom of the window allows you to save and deploy the service request in one step.

Defining Frame Relay Policies

To define a Frame Relay policy (with or without a CE present), perform the following steps.

Step 1 Choose **Service Design > Create Policy**.

The Policy Editor window appears.

Step 2 Choose **L2VPN** from the Policy Type drop-down list.

The Policy Editor window appears.

Step 3 Enter a **Policy Name** for the policy.

Step 4 Choose the **Policy Owner** for the policy.

There are three types of policy ownership:

- Customer ownership
- Provider ownership
- Global ownership—Any service operator can make use of this L2VPN policy.

This ownership has relevance when the Prime Provisioning Role-Based Access Control (RBAC) comes into play. For example, an policy that is customer-owned can only be seen by operators who are allowed to work on this customer-owned policy. Similarly, operators who are allowed to work on a provider’s network can view, use, and deploy a particular provider-owned policy.

Step 5 Click **Select** to choose the owner of the L2VPN.

(If you choose Global ownership, the Select function is not available.) The Select Customer window or the Select Provider window appears and you can choose an owner of the policy and click **Select**.

Step 6 Choose the **Service Type** of the L2VPN policy (in this case, Frame Relay).

Step 7 Check or uncheck the **CE Present** check box **as required**.

Step 8 Click **Next**.

The Interface Type window appears.

Step 9 Set the attributes in the Interface Type window as described in [Table E-2](#).



Note Attributes that appear in the GUI are determined by the type of policy being defined and whether or not a CE has been specified.

- Step 10** When you have set the attributes, click **Next** to proceed to the next window (or else click **Finish** to save the policy).
- Step 11** If you would like to use user-defined attributes within this policy, click **Next** (before clicking **Finish**). An additional window appears the policy workflow. This window allows you to create user-defined attributes within the policy (and service requests based on the policy). For background information on how to use the additional information feature, see [Appendix D, “Adding Additional Information to Services.”](#) If you are not using this feature, click **Next** to proceed to the Template Association window, or else click **Finish** to save the policy.
- Step 12** If you would like to enable template association for this policy, click **Next** (before clicking **Finish**). The Template Association window appears. In this window, you can enable template support and, optionally, associate templates and data files with the policy. For instructions about associating templates with policies and how to use the features in this window, See [Chapter 11, “Managing Templates and Data Files”](#) for more information about using templates and data files. When you have completed setting up templates and data files for the policy, click **Finish** in the Template Association window to close it and return to the Policy Editor window.
- Step 13** To save the Frame Relay policy, click **Finish**.

To create a service request based on a Frame Relay policy, see [Managing Service Requests, page 10-1](#).

Defining ATM Policies

To define an ATM policy (with or without a CE present), perform the following steps.

- Step 1** Choose **Service Design > Create Policy**.
The Policy Editor window appears.
- Step 2** Choose **L2VPN** from the Policy Type drop-down list.
The Policy Editor window appears.
- Step 3** Enter a **Policy Name** for the policy.
- Step 4** Choose the **Policy Owner** for the policy.
There are three types of policy ownership:
- Customer ownership
 - Provider ownership
 - Global ownership—Any service operator can make use of this L2VPN policy.
- This ownership has relevance when the Prime Provisioning Role-Based Access Control (RBAC) comes into play. For example, an policy that is customer-owned can only be seen by operators who are allowed to work on this customer-owned policy. Similarly, operators who are allowed to work on a provider’s network can view, use, and deploy a particular provider-owned policy.
- Step 5** Click **Select** to choose the owner of the L2VPN.

(If you choose Global ownership, the Select function is not available.) The Select Customer window or the Select Provider window appears and you can choose an owner of the policy and click **Select**.

Step 6 Choose the **Service Type** of the L2VPN policy (in this case, ATM).

Step 7 Check or uncheck the **CE Present** check box **as required**.

Step 8 Click **Next**.

The Interface Type window appears.

Step 9 Set the attributes in the Interface Type window as described in [Table E-2](#).



Note

Attributes that appear in the GUI are determined by the type of policy being defined and whether or not a CE has been specified.

Step 10 When you have set the attributes, click **Next** to proceed to the next window (or else click **Finish** to save the policy).

Step 11 If you would like to use user-defined attributes within this policy, click **Next** (before clicking **Finish**).

An additional window appears the policy workflow. This window allows you to create user-defined attributes within the policy (and service requests based on the policy). For background information on how to use the additional information feature, see [Appendix D, “Adding Additional Information to Services.”](#) If you are not using this feature, click **Next** to proceed to the Template Association window, or else click **Finish** to save the policy.

Step 12 If you would like to enable template association for this policy, click **Next** (before clicking **Finish**).

The Template Association window appears. In this window, you can enable template support and, optionally, associate templates and data files with the policy. For instructions about associating templates with policies and how to use the features in this window, See [Chapter 11, “Managing Templates and Data Files”](#) for more information about using templates and data files. When you have completed setting up templates and data files for the policy, click **Finish** in the Template Association window to close it and return to the Policy Editor window.

Step 13 To save the ATM policy, click **Finish**.

Managing a VPLS Service Request

This section contains the basic steps to provision a VPLS service. It contains the following subsections:

- [Overview, page 3-45](#)
- [Creating a VPLS Service Request, page 3-45](#)
- [Using Templates and Data Files with a VPLS Service Request, page 3-50](#)
- [Saving the VPLS Service Request, page 3-51](#)
- [Modifying the VPLS Service Request, page 3-51](#)

Overview

A VPLS service request consists of one or more attachment circuits, connecting various sites in a multipoint topology. When you create a service request, you enter several parameters, including the specific interfaces on the CE and PE routers and UNI parameters.

To create a service request, a service policy must already be defined, as described in [Creating a VPLS Policy, page E-35](#). Based on the predefined VPLS policy, an operator creates a VPLS service request, with or without modifications to the VPLS policy, and deploys the service. The service request must be the same service type (ERMS/EVP-LAN or EMS/EP-LAN) as the policy selected. Service creation and deployment are normally performed by regular network technicians for daily operation of network provisioning.

You can also associate Prime Provisioning templates and data files with a service request. See [Chapter 11, “Managing Templates and Data Files”](#) for more about using templates and data files in service requests.

It is also possible to create user-defined attributes within a policy (and service requests based on the policy). For background information on how to use the additional information feature, see [Appendix D, “Adding Additional Information to Services.”](#)

The following steps are involved in creating a service request for Layer 2 connectivity between customer sites:

1. Choose a VPLS policy.
2. Choose a VPN. For more information, see [Defining VPNs, page 3-9](#).
3. Add a link.
4. Choose a CE or UNI interface.
5. Choose a Named Physical Circuit (NPC) if more than one NPC exists from the CE or the UNI interface.
6. Edit the link attributes.

For sample configlets for VPLS scenarios, see [Sample Configlets, page 3-120](#).

Creating a VPLS Service Request

For information on creating specific types of VPLS service requests, see the following sections:

- [Creating a VPLS Service Request with a CE, page 3-45](#)
- [Creating a VPLS Service Request without a CE, page 3-47](#)

Creating a VPLS Service Request with a CE

To create a VPLS service request with a CE present, perform the following steps.



Note

In this example, the service request is for an VPLS policy over an MPLS core with an ERMS (EVP-LAN) service type and CE present.

- Step 1** Choose **Operate > Create Service Request**.
The Service Request Editor window appears.

Step 2 From the policy picker, choose a VPLS policy from the policies previously created (see [Creating a VPLS Policy, page E-35](#)).

The new service request inherits all the properties of that VPLS policy, such as all the editable and noneditable features and preset attributes.

The Edit VPLS Link window appears.

Step 3 Click **Select VPN** to choose a VPN for use with this CE.

The Select VPN window appears with the VPNs defined in the system. Only VPNs with the same service type (ERMS/EVP-LAN or EMS/EP-LAN) as the policy you chose appear.



Note The VC ID is mapped from the VPN ID. By default, Prime Provisioning will “auto pick” this value. However, you can set this manually, if desired. This is done by editing the associated VPN configuration. The Edit VPN window has an **Enable VPLS** check box. When you check this check box, you can manually enter a VPN ID in a field provided. For more information on creating and modifying VPNs, see [Setting Up Logical Inventory, page 2-53](#).

Step 4 Choose a **VPN Name** in the Select column.

Step 5 Click **Select**.

The Edit VPLS Link window appears with the VPN name displayed.

Step 6 Click **Add Link**.

The window updates, allowing you specify the CE endpoints.

Step 7 You can enter a description for the service request in the **Description** field.

The description will show up in this window and also in the Description column of the VPLS Service Requests window. The maximum length for this field is 256 characters.

Step 8 Click **Select CE** in the CE column.

The Select CPE Device window appears.

This window displays the list of currently defined CEs.

- a. From the **Show CPEs with** drop-down list, you can display CEs by Customer Name, by Site, or by Device Name.
- b. You can use the **Find** button to either search for a specific CE, or to refresh the display.
- c. You can set the **Rows per page** to 5, 10, 20, 30, 40, or All.

Step 9 In the Select column, choose a CE for the VPLS link.

Step 10 Click **Select**.

The Edit VPLS Link window appears displaying the name of the selected CE in the CE column.

Step 11 Choose the CE interface from the interface picker.



Note When you provision an ERMS (EVP-LAN) service (and when you choose a UNI for a particular device), Prime Provisioning determines if there are other services using the same UNI. If so, a warning message is displayed. If you ignore the message and save the service request, all of the underlying service requests lying on the same UNI are synchronized with the modified shared attributes of the latest service request. In addition, the state of the existing service requests is changed to the Requested state.

Step 12 Click **Select one circuit** in the Circuit Selection column.

The Select NPC window appears. If only one NPC exists for the chosen CE and CE interface, that NPC is automatically populated in the Circuit Selection column and you need not choose it explicitly.

Step 13 Choose the name of the NPC from the Select column.

Step 14 Click **OK**.

Each time you choose a CE and its interface, the NPC that was precreated from this CE and interface is automatically displayed under **Circuit Selection**. This means that you do not have to further specify the PE to complete the link.

Step 15 If you want to review the details of this NPC, click **Circuit Details** in the Circuit Details column.

The NPC Details window appears and lists the circuit details for this NPC.

Step 16 The Circuit ID is created automatically, based on the VLAN data for the circuit.

Step 17 To edit values that were set by the VPLS policy, that is, the values that were marked “editable” during the VPLS policy creation, click the **Edit** link in the Link Attributes column for a link.

The Edit VPLS window appears.

Step 18 Set attributes in this window per your requirements.



Note

For more information on setting attributes in this window, see the corresponding attributes for the VPLS policy as described in [Table E-5](#).

Step 19 Continue to specify additional CEs, as in previous steps, if desired.

Step 20 Click **OK**.

Step 21 Click **Save**.

The service request is created and saved into Prime Provisioning.

For additional information on working with VPLS service requests, see the following sections:

- [Using Templates and Data Files with a VPLS Service Request, page 3-50](#)
- [Saving the VPLS Service Request, page 3-51](#)
- [Modifying the VPLS Service Request, page 3-51](#)
- [Deploying, Monitoring, and Auditing Service Requests, page 3-51](#)

Creating a VPLS Service Request without a CE

To create a VPLS service request without a CE present, perform the following steps.



Note

In this example, the service request is for an VPLS policy over an MPLS core with an EMS (EP-LAN) service type and no CE present.

Step 1 Choose **Operate > Create Service Request**.

The Service Request Editor window appears.

Step 2 From the policy picker, choose a VPLS policy from the policies previously created (see [Creating a VPLS Policy, page E-35](#)).

The new service request inherits all the properties of that VPLS policy, such as all the editable and non-editable features and preset attributes.

The Edit VPLS Link window appears.

Step 3 Click **Select VPN** to choose a VPN for use with this PE.

The Select VPN window appears with the VPNs defined in the system. Only VPNs with the same service type (ERMS/EVP-LAN or EMS/EP-LAN) as the policy you chose appear.



Note The VC ID is mapped from the VPN ID. By default, Prime Provisioning will “auto pick” this value. However, you can set this manually, if desired. This is done by editing the associated VPN configuration. The Edit VPN window has an **Enable VPLS** check box. When you check this check box, you can manually enter a VPN ID in a field provided. For more information on creating and modifying VPNs, see [Setting Up Logical Inventory, page 2-53](#).

Step 4 Choose a **VPN Name** in the Select column.

Step 5 Click **Select**.

The Edit VPLS Link window appears with the VPN name displayed.

Step 6 Click **Add Link**.

The Edit VPLS Link window updates, allowing you specify the U-PE/PE-AGG/U-PE endpoints. You can add one or more links in the window.

Step 7 You can enter a description for the service request in the first **Description** field.

The description will show up in this window and also in the Description column of the VPLS Service Requests window. The maximum length for this field is 256 characters.

Step 8 Click **Select N-PE/PE-AGG/U-PE** in the N-PE/PE-AGG/U-PE column.

The Select PE Device window appears.

This window displays the list of currently defined PEs.

- a. The **Show PEs with** drop-down list shows PEs by customer name, by site, or by device name.
- b. The **Find** button allows a search for a specific PE or a refresh of the window.
- c. The **Rows per page** drop-down list allows the page to be set to 5, 10, 20, 30, 40, or All.

Step 9 In the **Select** column, choose the PE device name for the VPLS link.

Step 10 Click **Select**.

The Edit VPLS Link window appears displaying the name of the selected N-PE/PE-AGG/U-PE in the N-PE/PE-AGG/U-PE column

Step 11 To choose the UNI interface, click on the toggle button in the **Select One** field of the UNI Interface column.

The Interface Selection window appears. This window displays the available interfaces for the service based on the configuration of the underlying interfaces, existing service requests that might be using the interface, and the customer associated with the service request.

Step 12 Choose the UNI interface by clicking the radio button next to the interface name.



Note When you provision an ERMS service (and when you choose a UNI for a particular device), Prime Provisioning determines if there are other services using the same UNI. If so, a warning message is displayed. If you ignore the message and save the service request, all of the underlying service requests lying on the same UNI are synchronized with the modified shared attributes of the latest service request. In addition, the state of the existing service requests is changed to the Requested state.

Step 13 If the PE role type is U-PE, click **Select one circuit** in the Circuit Selection column.

The Select NPC window appears. If only one NPC exists for the chosen PE and PE interface, that NPC is automatically populated in the Circuit Selection column and you need not choose it explicitly.



Note If the PE role type is N-PE, the columns Circuit Selection and Circuit Details are disabled.

Step 14 Choose the name of the NPC from the **Select** column.

Step 15 Click **OK**.

Each time you choose a PE and its interface, the NPC that was precreated from this PE and interface is automatically displayed under **Circuit Selection**. This means that you do not have to further specify the PE to complete the link.

Step 16 If you want to review the details of this NPC, click **Circuit Details** in the Circuit Details column.

The NPC Details window appears and lists the circuit details for this NPC.

The Circuit ID is created automatically, based on the VLAN data for the circuit.

Step 17 To edit values that were set by the VPLS policy, that is, the values that were marked “editable” during the VPLS policy creation, click the **Edit** link in the Link Attributes column for a link.



Note For more information on setting attributes in this window, see the corresponding attributes for the VPLS policy as described in [Table E-5](#).

Step 18 Continue to specify additional PEs, as in previous steps, if desired.

Step 19 Click **Save**.

The service request is created and saved into Prime Provisioning.

For additional information on working with VPLS service requests, see the following sections:

- [Using Templates and Data Files with a VPLS Service Request, page 3-50](#)
- [Saving the VPLS Service Request, page 3-51](#)
- [Modifying the VPLS Service Request, page 3-51](#)
- [Deploying, Monitoring, and Auditing Service Requests, page 3-51](#)

Using Templates and Data Files with a VPLS Service Request

The template mechanism in Prime Provisioning provides a way to add additional configuration information to a device configuration generated by a service request. To use the template mechanism, the policy on which the service request is based must have been set to enable templates. Optionally, templates and data files to be used by the service request can be specified in the policy. During service request creation, templates/data files can be added to a device configuration if the operator has the appropriate RBAC permission to do so. See [Chapter 11, “Managing Templates and Data Files”](#) for more information about using templates and data files.

Saving the VPLS Service Request

To save a VPLS service request, perform the following steps.

-
- Step 1** When you are finished setting all the attributes for the attachment circuits, click **Save** to finish the VPLS service request creation.
- If the VPLS service request is successfully created, you will see a list of service requests in the Service Request Manager window. The newly created VPLS service request is added with the state of REQUESTED.
- Step 2** If, however, the VPLS service request creation failed for some reason (for example, a value chosen is out of bounds), you are warned with an error message.
- In such a case, you should correct the error and save the service request again.
- Step 3** If you are ready to deploy the service request, see [Deploying, Monitoring, and Auditing Service Requests, page 3-51](#).
-

Modifying the VPLS Service Request

To modify a VPLS service request, perform the following steps.

-
- Step 1** Choose **Operate > Service Request Manager**.
- Step 2** Check a check box for a service request.
- Step 3** Click **Edit**.
- The Edit VPLS Link window appears.
- Step 4** Specify items in the window as necessary for your configuration.
- Step 5** To modify the link attributes, click **Edit** in the Link Attributes column as shown in the VPLS link editor.
- The Edit VPLS window appears.
- Step 6** Edit the link attributes as desired.
- Step 7** Click **OK**.
- The Edit VPLS Link window appears.
- Step 8** When you are finished editing the VPLS links, click **Save**.
-

Deploying, Monitoring, and Auditing Service Requests

To apply EVC policies to network devices, you must deploy the service request. When you deploy a service request, Prime Provisioning compares the device information in the Repository (the Prime Provisioning database) with the current device configuration and generates a configlet. Additionally, you can perform various monitoring and auditing tasks on service requests. Information about common tasks that apply to all types of Prime Provisioning service requests is provided in [Chapter 10, “Managing Service Requests.”](#)

This section covers specific issues related to managing service request tasks for EVC services.

Pre-Deployment Changes

You can change the Dynamic Component Properties Library (DCPL) parameter **actionTakenOnUNIVlanList** before you deploy an EVC service request. This will be necessary if the **trunk allowed vlan** list is not present on the User Network Interface (UNI).

To make this change, perform the following steps.

-
- Step 1** Choose **Administration > Hosts**.
- Step 2** Choose the host that you want to change.
- Step 3** Click **Config**.
The Host Configuration window appears.
- Step 4** In the DCPL properties panel, choose **Provisioning > Service > shared > actionTakenOnUNIVlanList**.
The Attribute details appear.
- Step 5** In the **New Value** drop-down list, choose one of the following:
- **prune** to have Prime Provisioning create the minimum VLAN list. This is the default.
 - **abort** to have Prime Provisioning stop the L2VPN or VPLS service request provisioning with the error message: **trunk allowed vlan list is absent on ERS UNI**.
 - **nochange** to have Prime Provisioning allow all VLANs.
- Step 6** Click **Set Property**.
-

Provisioning VPLS Autodiscovery on Devices using EVC Service Requests

This section describes how enable the VPLS autodiscovery in Prime Provisioning. It contains the following sections:

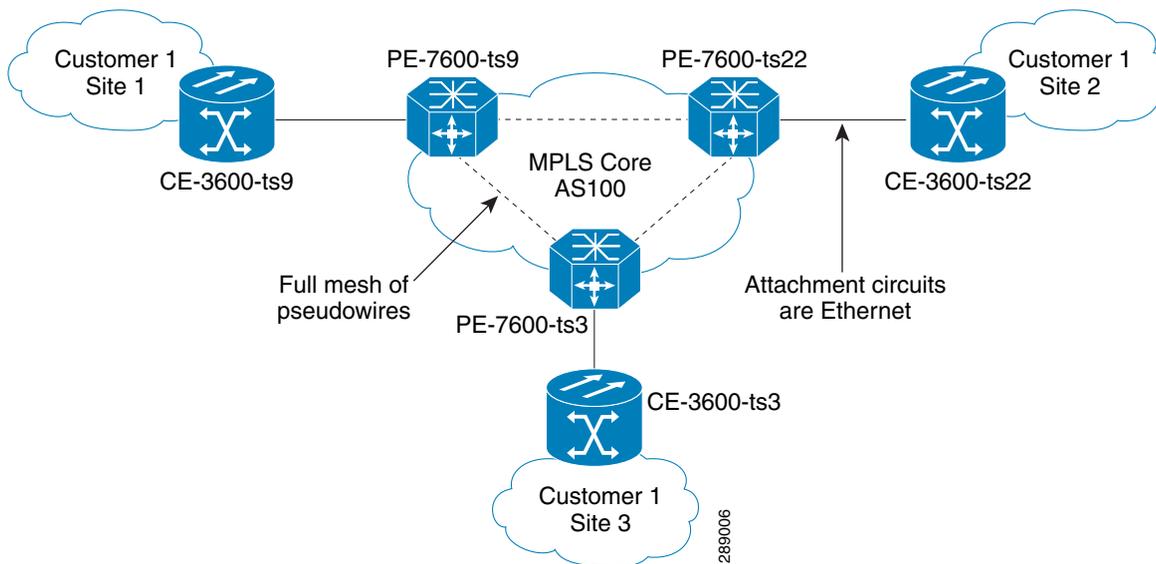
- [Overview, page 3-53](#)
- [Limitations and Restrictions for VPLS Autodiscovery, page 3-53](#)
- [Preconfiguring PE Devices to Support VPLS Autodiscovery, page 3-54](#)
- [Enabling VPLS Autodiscovery in the EVC Workflow, page 3-54](#)
- [Sample Configlets, page 3-55](#)

Overview

Earlier implementations of VPLS in IOS and IOS XR required manual configuration of each VPLS PE neighbor when devices were added or removed from the VPLS domain. VPLS auto discovery eliminates the need to manually configure the VPLS neighbors. It discovers PEs within the same VPLS domain and automatically detects when PEs are added or removed from the domain.

Figure 3-1 shows an example VPLS topology that will be referenced in this section. The three PE devices constitute the neighbors in the VPLS domain. As PEs are added or removed from the domain, VPLS autodiscovery keeps the PE configurations updated.

Figure 3-1 VPLS Autodiscovery Topology Example



To provision VPLS autodiscovery on PE devices in the VPLS domain, you must perform two basic tasks:

- You must preconfigure some configlets on the devices before they are provisioned by Prime Provisioning. You must do this manually or through the use of templates. See [Preconfiguring PE Devices to Support VPLS Autodiscovery](#), page 3-54.
- You must enable VPLS autodiscovery within the EVC service request(s) used to provision the PE(s) in the VPLS domain.

The rest of this section documents limitations and restrictions of VPLS autodiscovery, describes the steps you must perform in the workflow to enable it, and provides sample configlets generated on IOS and IOS XR devices.

Limitations and Restrictions for VPLS Autodiscovery

Keep in mind the following limitations and restrictions when using VPLS autodiscovery Prime Provisioning.

- To use VPLS autodiscovery, all PE devices in the VPLS domain must have VPLS autodiscovery enabled. Mixed topologies (that is, some PEs configured with VPLS autodiscovery enabled and some without) are not supported. The VPLS discovery mode should be enabled for all service requests under the same virtual forwarding interface (VFI).

- Some preconfiguration on the PEs in the VPLS domain is required. See [Preconfiguring PE Devices to Support VPLS Autodiscovery, page 3-54](#).
- Split horizon should be enabled for when using VPLS autodiscovery.
- VPLS autodiscovery can only be configured in Prime Provisioning using EVC Ethernet service requests for which the MPLS Core Connectivity Type is set as VPLS. The feature is not supported for other Prime Provisioning service requests and/or connectivity types.
- The same discovery mechanism must be used to build a pseudowire between two PE peers. It is not valid for both auto discovered and manually configured pseudowires in the same VFI to go to the same peer PE. For example, it is not valid for PE1 to be manually configured for PE2 and PE2 be dynamically configured to discover PE1.
- Once the VPLS discovery mode is provisioned (as manual or autodiscovery) in the service required, it cannot be modified.
- VPLS autodiscovery is only supported for full-mesh topologies, not hub and spoke topologies like hierarchical VPLS (H-VPLS).
- VPLS autodiscovery is not supported with inter-autonomous system configurations.

Preconfiguring PE Devices to Support VPLS Autodiscovery

The following configlets must be preconfigured on IOS and IOS XR devices before provisioning VPLS autodiscovery on them. The configlets are required to set up MP-iBGP peering with other PEs and to enable VPLS L2VPN community information exchange with other PEs in the same VPLS domain.

```
! Setup MP-iBGP peering with other PEs !
router bgp 100
  no bgp default ipv4-unicast
  bgp log-neighbor-changes
  neighbor 193.193.20.3 remote-as 100
  neighbor 193.193.20.3 update-source Loopback0
  neighbor 193.193.20.5 remote-as 100
  neighbor 193.193.20.5 update-source Loopback0

! Enable VPLS l2vpn community info exchange with other PEs in the same VPLS domain !
address-family l2vpn vpls
  neighbor 193.193.20.3 activate
  neighbor 193.193.20.3 send-community extended
  neighbor 193.193.20.5 activate
  neighbor 193.193.20.5 send-community extended
exit-address-family
!
```

Enabling VPLS Autodiscovery in the EVC Workflow

To enable VPLS discovery in the EVC Ethernet workflow, perform the following steps.

-
- Step 1** In the EVC Ethernet policy or service request workflow, set the **MPLS Core Connectivity Type** to **VPLS**.

When the core connectivity is VPLS, the Discovery Mode attribute dynamically appears in the Service Request Details section of the EVC Service Request Editor window. This window describes the VPLS connectivity between the attachment circuits. VPLS connectivity allows the creation of a multipoint connection between two customer sites, using direct connect links or L2 access links.

Step 2 Choose the **Discovery Mode** type in the EVC Service Request Editor window.

The choices are:

- **Manual**— When the Manual option is selected, the **vfi** command will be configured as in legacy with the **manual** option. This is the same for both IOS and IOS XR devices. The signaling protocol implemented is LDP.
- **Auto Discovery**— When the Auto Discovery option is selected, the **vfi** command will be configured with the **autodiscovery** option, and the **neighbor** command is not required.

For examples of the resulting configlets generated by these choices, see [Sample Configlets, page 3-55](#).

Step 3 Save the service request and deploy it on the device(s) in the VPLS domain.

Sample Configlets

This section provides sample configlets generated by Prime Provisioning for both IOS and IOS XR devices for VPLS autodiscovery.

Sample Configlet for IOS Device

```
! Setup VPLS instance,!
l2 vfi customer1 autodiscovery
vpn id 100

! Set attachment circuit interface in VLAN mode !
interface FastEthernet4/1
description VPN for CE9-3640-ts22
switchport
switchport access vlan 100
switchport mode access
no cdp enable

! Bind VLAN100(AC) to the customer1 pseudowire !
interface Vlan100
no ip address
xconnect vfi customer1
```

Sample Configlet for IOS XR Device

```
l2vpn
bridge group abc
bridge-domain east
vfi vfname
vpn-id 678
autodiscovery bgp
rd auto
route-target 456:567
```



Note

For IOS XR devices, the Route Target value must be saved while creating the VPN.

Policy and Service Request Attributes Reference Tables

This section provides reference information for attributes appearing in windows in EVC Ethernet, EVC ATM-Ethernet Interworking, EVC policies and service requests. To find attributes and descriptions refer to the appropriate section for the service:

- [EVC Ethernet Service Attributes, page 3-56](#)
- [EVC ATM-Ethernet Interworking Service Attributes, page 3-90](#)
- [Sample Configlets, page 3-120](#)

EVC Ethernet Service Attributes

This section describes policy and service request attributes for EVC Ethernet services:

- [EVC Ethernet Policy Attributes, page 3-56](#)
- [EVC Ethernet Service Request Attributes, page 3-72](#)

EVC Ethernet Policy Attributes

- [Service Options Window, page 3-56](#)
- [EVC Attributes Window, page 3-61](#)
- [Interface Attributes Window, page 3-67](#)



Note

Some attributes are supported only on IOS or IOS XR platforms. Attributes apply to both platforms, unless otherwise noted. All platform-specific attributes are visible in the policy workflow windows. Later, when a service request is created based on the policy (and specific devices are associated with the service request), platform-specific attributes are filtered from service request windows, depending on the device type (IOS or IOS XR).

Service Options Window

[Table 3-2](#) describes the attributes in the Service Options window of the EVC Ethernet policy workflow.

Table 3-2 Service Options

Attribute	Description
CE Directly Connected to EVC	<p>Check the box if the CEs are directly connected to the N-PE. Usage notes:</p> <ul style="list-style-type: none"> • If the check box is checked, a service request created using this policy can have only directly connected links. No Ethernet access nodes will be involved. • If the check box is unchecked, a service request created using this policy might or might not have Ethernet access nodes in the links. • When a CE is directly connected to the N-PE, NPCs are not applicable to the link while creating service requests. • When a CE is not directly connected to the N-PE, NPCs are used during service request creation, as per standard Prime Provisioning behavior. There is no change in NPC implementation to support EVC functionality.

Table 3-2 Service Options (continued)

Attribute	Description
All Links Terminate on EVC	<p>Check the box if links need to be configured with EVC features. Usage notes:</p> <ul style="list-style-type: none"> • If the check box is checked, a service request created using such policy will have all links using the EVC feature. • If the check box is unchecked, zero or more links can use the EVC feature. This ensures that existing platforms can still be used in one or more links while delivering the services. This allows the possibility of a link with EVC support being added in the future. • If the check box is unchecked, in the service request creation process the user must indicate whether or not the created link is EVC or non-EVC. • If no links are expected to use the EVC feature even in the future (for example, if the provider is not planning to upgrade to the EVC infrastructure for the service that is being created), existing Prime Provisioning policy types (L2VPN or VPLS) can be used instead of EVC.
All L2 Access Links default to EVC UNI	<p>Check the box to enable EVC syntax configuration on all access devices (U-PE and PE-AGG) throughout the circuit. This shows up in service request as EVC-related attributes for all of these device types. If this attribute is not enabled in the service request, EVC service-related syntax will only be available for N-PE devices.</p>
MPLS Core Connectivity Type	<p>From the drop-down list, choose the MPLS core connectivity type. The core option supports MPLS only. There is no L2TPv3 support for this service. The choices are:</p> <ul style="list-style-type: none"> • PSEUDOWIRE—Choose this option to allow connectivity between two N-PEs across the MPLS core. This option does not limit the service to point-to-point (E-Line). This is because even with the PSEUDOWIRE option selected, there can still be multiple CEs connected to a bridge domain on one or both sides of the pseudowire.
	<ul style="list-style-type: none"> • LOCAL—Choose this option for local connect cases in which there is no connectivity required across the MPLS core. Local connect supports the following scenarios: <ul style="list-style-type: none"> – All interfaces on the N-PE are EVC-capable and using the EVC infrastructure. This is configured by associating all of the customer traffic on these interfaces to a bridge domain. This consumes a VLAN ID on the N-PE (equal to the bridge domain ID). – Some interfaces on the N-PE are EVC-capable, while others are switch-port-based. In such cases, all of the customer traffic on the interfaces that are configured with the EVC infrastructure are associated to a bridge domain. The traffic on the non-EVC interfaces (and all the access nodes/interfaces beyond this N-PE) are configured with the Service Provider VLAN ID, where the Service Provider VLAN ID is the same as the bridge domain ID for the EVC-based services. – Only two interfaces on the N-PE are involved, and both are based on EVC-capable line cards. In the first case, the operator might choose not to configure the bridge domain option. In this case, the connect command that is used for the local connects are used, and the global VLAN is conserved on the device. If the operator chooses to configure with the bridge domain option, both interfaces are associated to a bridge domain ID, so that additional local links can be added to the service in future. This consumes a VLAN ID (bridge domain ID) on the N-PE.

Table 3-2 Service Options (continued)

Attribute	Description
	<ul style="list-style-type: none"> • VPLS—Choose this option to allow connectivity between multiple N-PEs across the MPLS core. <ul style="list-style-type: none"> – This includes support for multi-segment pseudowire over an MPLS-TP enabled network. Some or all of the LSPs interconnecting the VPLS instances can be admitted onto existing MPLS-TP tunnels (which may have been provisioned using Prime Provisioning). The LSPs may be configured as multi-segment pseudowires, where each hop can be admitted onto an MPLS-TP tunnel. Prime Provisioning will automatically route the multi-segment pseudowire along the shortest path, taking into consideration any included and/or excluded nodes and/or tunnels. – The LSP/pseudowire labels may be statically allocated by Prime Provisioning. This eliminates the need for a directed protocol to be run within the VPLS to do label exchange and therefore further eliminates the need for IP connectivity between the endpoints in the VPLS. – The pool of MPLS labels is shared across VPLS and MPLS-TP services (if they come from the same MPLS static label range on the device). Otherwise Prime Provisioning uses the separate tunnel and service label ranges that are configured on the device. Labels already in use are discovered and removed from the label pool to ensure unique allocation of MPLS labels. <p>There is no limit on the number of N-PEs across the MPLS core within a service request. However, many service requests can refer to the same customer-associated VPN.</p>
Configure With Bridge Domain	<p>Check the box to determine bridge domain characteristics. The behavior of the Configure With Bridge-Domain option works in tandem with the choice you selected in the MPLS Core Connectivity Type option, as follows.</p> <ul style="list-style-type: none"> • PSEUDOWIRE as the MPLS Core Connectivity Type. There are two cases: <ol style="list-style-type: none"> A. With EVC: <ul style="list-style-type: none"> – If Configure With Bridge Domain is checked, the policy configures pseudowires under SVIs associated to the bridge domain. – If Configure With Bridge Domain is unchecked, the policy will configure pseudowires directly under the service instance. This conserves the global VLAN. B. Without EVC: <ul style="list-style-type: none"> – If Configure With Bridge Domain is checked, the policy configures pseudowires as in L2VPN services (with SVIs). – If Configure With Bridge Domain is unchecked, the policy configures pseudowires directly under subinterfaces.

Table 3-2 Service Options (continued)

Attribute	Description
	<p>Only pseudowires can be either configured directly under service instance of the corresponding EVC-capable interface or under SVIs associated to the bridge domain.</p> <ul style="list-style-type: none"> • LOCAL as the MPLS Core Connectivity Type: <ul style="list-style-type: none"> – If Configure With Bridge Domain is checked, the policy allows either point-to-point or multipoint local connect services. – If Configure With Bridge Domain is unchecked, Prime Provisioning allows only point-to-point local connects without bridge domain. • VPLS—Configure With Bridge Domain is checked by default and non-editable. <p>When the VPLS service option is selected, VPLS-specific service options appear.</p> <ul style="list-style-type: none"> – Check the Static VPLS (AutoPick MPLS Labels) check box to automatically allocate static labels. The static labels are allocated when the service request is saved. – Check the Configure Pseudowire Segment(s) check box to allow the VPLS service to be admitted onto MPLS-TP tunnels and “stitch” together tunnels to form a simulated end-to-end path.
Allow Spoke nodes	<p>This attribute is used to enable H-VPLS on EVC VPLS services. It allows the selection of spoke (leaf) nodes in the access of H-VPLS topology. If this check box is enabled, in the service request workflow, the user will be able to set the N-PE as hub or spoke nodes alone. (A spoke node can also be called a “leaf node,” which is connected to a hub node).</p> <p>This attribute only appears if the MPLS Core Connectivity Type is set as VPLS.</p>
Allow Spoke with Spoke nodes	<p>This attribute can also be used to enable H-VPLS on EVC VPLS services. It allows the selection of interior nodes in the access of H-VPLS topology, which can again be connected with other leaf nodes. Enabling this check box will enable “Allow spokes nodes” (see previous attribute) by default. Because of this, in the service request workflow, the user will be able to set the N-PE as a hub or spoke with additional spoke nodes.</p> <p>When you provision an H-VPLS service with the node as HUB, you can save the SR without selecting an UNI. But when the H-VPLS node is a SPOKE or SPOKE WITH SPOKE you need to select an interface.</p> <p>This attribute only appears if the MPLS Core Connectivity Type is set as VPLS.</p>
E Tree	<p>Check the box to choose one of the E Tree role options. When you choose E Tree, the split horizon attribute is hidden from the policy and SR level, and it is controlled internally using E Tree Role.</p> <p>This attribute only appears if the MPLS Core Connectivity Type is set as VPLS.</p>
E Tree Role	<p>Choose an option. The choices are:</p> <ul style="list-style-type: none"> • Root - Allows communication with all the end points. • Leaf - Allows communication only with the root nodes. <p>To change the E Tree role option while creating a Service Request, check the Editable box of this attribute.</p>

Table 3-2 Service Options (continued)

Attribute	Description
Split Horizon	<p>Check the box to enable split horizon with bridge domain. Usage notes:</p> <ul style="list-style-type: none"> • The Use Split Horizon attribute is disabled by default. • The Use Split Horizon attribute can be used only when the Configure With Bridge Domain check box is checked (enabled). • When Split Horizon is enabled, the bridge domain command in the CLI will be generated with split horizon. When it is disabled, the bridge domain command will be generated without split horizon.
Static Pseudowire (Autopick MPLS Labels)	<p>Choose a type. The choices are:</p> <ul style="list-style-type: none"> • All Dynamic—Labels will be allocated dynamically during provisioning. No static labels will be added into the configlet. • All Static—Labels will be allocated statically during provisioning. Every segment in a multi-segment pseudowire will have static labels assigned to it on per-segment basis. • Defaults—Prime Provisioning will automatically determine whether or not to apply static labels based on the core type of the segment. It will do this on a per segment basis. A multi-segment pseudowire over LDP defaults to dynamic pseudowire. Multi-segment pseudowire over MPLS-TP defaults to static pseudowire. <p>This attribute only supported for MPLS Core Connectivity Types of PSEUDOWIRE or VPLS.</p>
Configure Pseudowire Segment(s)	<p>Check the box to enable ability to configure pseudowire classes on a per segment basis in the service request based on this policy. Usage notes:</p> <ul style="list-style-type: none"> • The Configure Pseudowire Segment(s) attribute is only applicable for MPLS core connectivity types of PSEUDOWIRE and VPLS. With a VPLS core type, the attribute shows up in the Service Options window of the Policy Editor. With a PSEUDOWIRE core type, the attribute shows up in the Interface Attributes window in the block of other pseudowire-related attributes. • The Configure Pseudowire Segment(s) attribute is used in conjunction with the Static Pseudowire (Autopick MPLS Labels) attribute to configure the individual segments within a multi-segment pseudowire to be either dynamic or static. This allows you to override the default behavior of Prime Provisioning. • A segment can be a TP tunnel, a TE tunnel, or an LDP (dynamic) core. • The configuration is done subsequently in the service request based on the policy. When setting up the links in the service request, you can independently assign Pseudowire classes to ends of the segments of multi-segment pseudowires. For information on attaching pseudowire classes to links see Configuring Multi-segment Pseudowires, page 3-26. • The Configure Pseudowire Segment(s) attribute is not currently supported in EVC ATM-Ethernet Interworking policies and service requests.

Table 3-2 Service Options (continued)

Attribute	Description
UNI Multiplexing	<p>This attribute helps in creating EPL and EVPL policy. Usage notes:</p> <ul style="list-style-type: none"> To create an EVPL policy, check the UNI Multiplexing check box. <p> Note By default, the check box is always checked</p> <ul style="list-style-type: none"> To create an EPL policy, uncheck the UNI Multiplexing check box. <p>When you create an SR using EPL policy with an interface, then that interface is not available for further provisioning of any EPL or EVPL services. When you create an SR using EVPL policy with an interface, then that interface will be available for provisioning EVPL services but not for EPL services.</p>
Reserved Bandwidth	<p>Pseudowire bandwidth for EVC services can be managed by specifying this attribute value. Prime Provisioning compares the reserved bandwidth value with the bandwidth unallocated on the MPLS-TP tunnel. If this value is more than the tunnel bandwidth, provisioning throws an error and moves the SR to invalid state.</p> <p>This attribute only appears if the MPLS Core Connectivity Type is set as PSEUDOWIRE.</p>
Configure Pseudowire Headend	<p>When this check box is checked the interface acts as a pseudowire-ether interface and the special attributes related to pseudowire headend appears during the SR creation. When this check box is unchecked the interface of pseudowire-ether acts as a normal gigabit interface where sub interfaces can be configured.</p> <p>This attribute only appears if the MPLS Core Connectivity Type is set as PSEUDOWIRE.</p>

EVC Attributes Window

Table 3-3 describes the attributes available in the EVC Attributes window of EVC Ethernet policy workflow.

EVC attributes are organized under the following categories:

- **Service Attributes.** The EVC service attributes are the same no matter which MPLS Core Connectivity Type has been selected.
- **VLAN Match Criteria.** Prior to the introduction of the EVC capability, service providers could either deploy service-multiplexed services (ERS/ERMS or EVPL/EVCS) or service-bundled services on a single port. Both could not be supported simultaneously due to the limitations in the infrastructure, which only allowed matching the outer-most VLAN tag.

One of the key benefits of EVC support in Prime Provisioning is to provide a flexible means to examine the VLAN tags (up to two levels) of the incoming frames and associate them to appropriate Ethernet Flow Points (EFPs). This allows service providers to deploy simultaneously both the service-multiplexed and service-bundled services on a single port.
- **VLAN Rewrite Criteria.** Together with VLAN matching criteria, VLAN rewrite makes the EVC infrastructure very powerful and flexible. The following VLAN rewrite options are supported:
 - Pop one or two tags.
 - Push one or two tags.
 - Translation (1:1, 2:1, 1:2, 2:2).

Be aware of the following considerations when setting the VLAN rewrite criteria attributes:

- Only one kind of rewrite can be done on every CE-facing EVC link.
- All VLAN rewrites are done using the **symmetric** keyword on the ingress traffic (for example, **rewrite ingress tag pop 2 symmetric**).
- For any service instance, only one type of rewrite option (pop, push, or translate) is allowed per instance. For example, if pop out is enabled, push inner, push outer, translate inner, and translate outer are not available.

Table 3-3 EVC Attributes

Attribute	Description
Service Attributes	
AutoPick Service Instance ID	<p>Check the box to specify that the service instance ID will be autogenerated and allocated to the link during service request creation. If the check box is unchecked, while setting the Prime Provisioning link attributes during service request creation, Prime Provisioning will prompt the operator to specify the service instance ID. Usage notes:</p> <ul style="list-style-type: none"> • The service instance ID represents an Ethernet Flow Point (EFP) on an interface in the EVC infrastructure. The service instance ID is locally significant to the interface. This ID has to be unique only at the interface level. The ID must be a value from 1 to 8000. • There are no resource pools available in Prime Provisioning from which to allocate the service instance IDs. • It is the responsibility of the operator creating the service request to maintain the uniqueness of the ID at the interface level.
AutoPick Service Instance Name	<p>Check the box to have Prime Provisioning autogenerated a service instance name when you create a service request based on the policy. The autogenerated value is in the following pattern: <i>CustomerName_ServiceRequestJobID</i>. If the check box is unchecked, then you can enter a value during service request creation.</p>
Enable PseudoWire Redundancy	<p>Check the box to enable pseudowire redundancy (alternative termination device) under certain conditions. Usage notes:</p> <ul style="list-style-type: none"> • Enable Pseudo Wire Redundancy is only available if the MPLS Core Connectivity Type was set as PSEUDOWIRE in the Service Options window (see Defining the EVC Ethernet Policy, page 3-20). • Enabling this feature allows the user to do the following: <ul style="list-style-type: none"> – Configure two pseudowires between two direct links, or: – Add a backup peer such that pseudowires are configured between A–Z and A–Z'. In this case, the terminating links A, Z, and Z' must all be directly connected links. L2 access links are not supported as backup peers. • See Setting Up Pseudowire Redundancy and a Backup Peers, page 3-28, for more information on using this feature in service requests. • See Appendix B, “Terminating an Access Ring on Two N-PEs” and, specifically, the section Using N-PE Redundancy in FlexUNI/EVC Service Requests, page B-3, for notes on how this option can be used.

Table 3-3 EVC Attributes (continued)

Attribute	Description
Enable Trunk EFP	<p>Check the box to provide flexibility to make many Layer 2 flow points within one interface. This attribute appears only when the EVC check box is checked in Direct Connect Links section. Trunk EFP supports only ASR920 IOS device. Usage notes:</p> <ul style="list-style-type: none"> • If the check box is checked, user will get “service instance trunk <id> ethernet” command. • If the check box is checked, the Match Inner and Outer Tags are disabled. • If the check box is checked, Autopick Outer VLAN and single value Outer VLAN are not allowed. • If the check box is checked, Outer VLAN ID only with ranges is allowed.
AutoPick VC ID	<p>Check the box to have Prime Provisioning autopick the VC ID during service request creation. If this check box is unchecked, the operator will be prompted to specify a VC ID during service request creation. Usage notes:</p> <ul style="list-style-type: none"> • This attribute is available only if MPLS Core Connectivity of Type was set as PSEUDOWIRE or VPLS in the Service Options window (see Defining the EVC Ethernet Policy, page 3-20). • When AutoPick VC ID is checked, Prime Provisioning allocates a VC ID for pseudowires from the Prime Provisioning-managed VC ID resource pool. • If MPLS Core Connectivity of Type is VPLS, Prime Provisioning allocates the VPLS VPN ID from the Prime Provisioning-managed VC ID resource pool.
AutoPick VFI Name	<p>Check the box to have Prime Provisioning autopick the virtual forwarding instance (VFI) name during service request creation. If this check box is unchecked, the operator will be prompted to specify a VFI name during service request creation.</p> <p>The AutoPick VFI Name attribute is only applicable if the MPLS Core Connectivity Type is set as VPLS. For other core types (PSEUDOWIRE and LOCAL), this attribute will not be displayed.</p>
AutoPick Bridge Domain/VLAN ID	<p>Check the box to have Prime Provisioning autopick the VLAN ID for the service request during service request creation. If this check box is unchecked, the operator will be prompted to specify a VLAN ID during service request creation. Usage notes:</p> <ul style="list-style-type: none"> • AutoPick Bridge Domain/VLAN ID consumes a global VLAN ID on the device. • The bridge domain/VLAN ID is picked from the existing Prime Provisioning VLAN pool. Once the VLAN ID is assigned in the service request, Prime Provisioning makes the VLAN ID unavailable for subsequent service requests. • In the case of manual VLAN ID allocation, Prime Provisioning does not manage the VLAN ID if the ID lies outside the range of an Prime Provisioning-managed VLAN pool. In this case, the operator must ensure the uniqueness of the ID in the Ethernet access domain. If an operator specifies a VLAN ID that is within the range of an Prime Provisioning-managed VLAN pool and the VLAN ID is already in use in the access domain, Prime Provisioning displays an error message indicating that the VLAN ID is in use. <p>For additional information on Access VLAN IDs, see Note on Access VLAN IDs, page 3-66.</p>

Table 3-3 EVC Attributes (continued)

Attribute	Description
AutoPick Bridge Group Name	Check the box to have Prime Provisioning autopick the group name for the service request during service request creation. If this check box is unchecked, the operator will be prompted to specify a group name during service request creation. If the check box is checked, the group name will default to the customer name. This attribute is applicable only for supported IOS XR devices.
AutoPick Bridge Domain Name	Check the check box to have Prime Provisioning autopick the domain name for the service request during service request creation. Usage notes: <ul style="list-style-type: none"> • If this check box is unchecked, the operator will be prompted to specify a domain name during service request creation. • If the check box is checked, the domain name will default to the following format: <ul style="list-style-type: none"> – For pseudowire and local connect core types: <i>ISC-Job-Job_ID</i>, where <i>Job_ID</i> is the service request job ID. – For VPLS core type: <i>ISC-VPN_Name-VPN_ID</i>, where <i>VPN_Name</i> is the name of the VPLS VPN being used, and <i>VPN_ID</i> is the VPN ID used in the service request. • This attribute is applicable only for supported IOS XR devices.
VLAN Matching Criteria Attributes	
Match	Choose an encapsulation type from the drop-down list. The choices are: <ul style="list-style-type: none"> • DOT1Q • DEFAULT • UNTAGGED • PRIORITY TAGGED • DOT1AD Selecting Default as the match criteria disables the Outer VLAN ID and Outer VLAN Ranges fields on the page. If Default is the CE encapsulation type, Prime Provisioning shows another field for the UNI port type.
Match Inner and Outer Tags	Check the box to enable service requests created with the policy to match both the inner and outer VLAN tags of the incoming frames. If you do not check this check box, service requests created with the policy will match only the outer VLAN tag of the incoming frames. Checking the Match Inner and Outer attribute causes the Inner VLAN Ranges attribute (covered in the next steps) to appear in the EVC Attribute window.
Inner VLAN Ranges	Check the box to enable the range of inner VLAN tags to be specified during service request creation. If the check box is unchecked, the range of inner VLAN tags are not allowed. In this case, the operator must specify discrete VLAN IDs during service request creation.
Outer VLAN Ranges	Check the box to enable the range of outer VLAN tags to be specified during service request creation. If the check box is unchecked, the range of outer VLAN tags are not allowed. In this case, the operator must specify discrete VLAN IDs during service request creation.

Table 3-3 EVC Attributes (continued)

Attribute	Description
AutoPick Outer VLAN	<p>Check the box to have Prime Provisioning autopick the outer VLAN ID from a previously created outer VLAN ID resource pool during service request creation. If this check box is unchecked, the operator will be prompted to specify an outer VLAN ID during service request creation. Usage notes:</p> <ul style="list-style-type: none"> • Use of the AutoPick Outer VLAN attribute requires that two elements have already been set up in Prime Provisioning. One is an Interface Access Domain, which is a logical element that groups the physical ports of an N-PE device. The other is an EVC Outer VLAN resource pool, which is used by the Interface Access Domain. For instructions on how to set up these elements, see the sections Setting Up Resources, page 2-39, and Resource Pools, page 2-43. • AutoPick Outer VLAN can be used for interfaces that support EVC functionality. • AutoPick Outer VLAN consumes a VLAN ID on the interface that supports EVC. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool.
AutoPick Inner VLAN	<p>Check the box to have Prime Provisioning autopick the Inner VLAN ID from a previously created inner VLAN ID resource pool during service request creation. If this check box is unchecked, the operator will be prompted to specify an Inner VLAN ID during service request creation. Usage notes:</p> <ul style="list-style-type: none"> • Use of the AutoPick Inner VLAN attribute requires that two elements have already been set up in Prime Provisioning. One is an Interface Access Domain, which is a logical element that groups the physical ports of an N-PE device. The other is an EVC Inner VLAN resource pool, which is used by the Interface Access Domain. For instructions on how to set up these elements, see the sections Setting Up Resources, page 2-39, and Resource Pools, page 2-43. • AutoPick Inner VLAN can be used for interfaces that support EVC functionality. • AutoPick Inner VLAN consumes a VLAN ID on the interface that supports EVC. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool. <p> Note The Match Inner and Outer Tags check box should be enabled in the policy to make use of AutoPick Inner VLAN feature during service request creation.</p>
VLAN Rewriter Criteria Attributes	
Pop Outer	Check the box to pop the outer VLAN ID tag of the incoming frames that fulfill the match criteria. If this check box is unchecked, the outer tag of the incoming traffic is not popped.
Pop Inner	Check the check box to pop the inner VLAN ID tag of the incoming frames that fulfill the match-criteria. If this check box is unchecked, the inner tag is not popped. Note that, if Pop Inner is checked, Pop Outer is automatically checked.

Table 3-3 EVC Attributes (continued)

Attribute	Description
Push Outer	<p>Check the box to impose an outer VLAN ID tag onto the incoming frames that fulfill the match criteria. If this check box is unchecked, no outer tag is imposed on the incoming frames. Usage notes:</p> <ul style="list-style-type: none"> • If Push Outer is checked, all service requests created with the policy push a dot1q outer tag on the incoming frames matching the match criteria. When creating the link during service creation, the operator can specify an outer tag with a value from 1 to 4096. • This attribute is available regardless of the number of tags used in the match criteria. Whether the incoming traffic is double tagged or single tagged, if Push Outer is enabled, all corresponding service requests push an outer tag. All subsequent nodes consider only the outer-most two tags (if EVC-capable) or just one tag (not EVC-capable) and treat the inner-most tags transparently as payload. • This VLAN ID is not derived from Prime Provisioning-managed VLAN ID pools.
Push Inner	<p>Check the box to impose an inner VLAN ID tag onto the incoming frames that fulfill the match criteria. This operation pushes both an inner and an outer tag onto the incoming packet, not just an inner tag. If this check box is unchecked, no inner tag is imposed on the incoming frames. Usage notes:</p> <ul style="list-style-type: none"> • If Push Inner is checked, all service requests created with the policy push a dot1q inner tag on the incoming frames matching the match criteria. When creating the link during service creation, the operator can specify an inner tag with a value from 1 to 4096. • If Push Inner is checked, Push Outer is automatically checked. • This attribute is available regardless of the number of tags used in the match criteria. Regardless of whether the incoming traffic is double tagged or single tagged, if Push Inner is enabled, all corresponding service requests push an inner tag. All subsequent nodes consider only the outer-most two tags (if EVC-capable) or just one tag (not EVC-capable) and treat the inner-most tags transparently as payload. • This VLAN ID is not derived from Prime Provisioning-managed VLAN ID pools.
Translate Outer	<p>Check the box to allow the operator to specify a target outer VLAN ID during service request creation. The outer tag of all the incoming frames that fulfill the match criteria are translated to this ID. If the check box is unchecked, no outer tag translation is performed. See Table 3-4.</p>
Translate Inner	<p>Check the box to allow the operator to specify a target inner VLAN ID during service request creation. The inner tag of all the incoming frames that fulfill the match criteria are translated to this ID. If the check box is unchecked, no inner tag translation is performed. See Table 3-4.</p>

Note on Access VLAN IDs

An access VLAN ID is of local significance to the EVC-capable ports. It should not be confused with the global VLANs. This can be visualized as a partitioning of the Ethernet access network beyond the EVC ports into several subEthernet access domains (one each for an EVC-capable port).

However, all the service interfaces on the Ethernet access nodes beyond the EVC ports will have this very same VLAN ID for a link. This ID must be manually specified by the operator when setting the link attributes during service request creation. The operator must ensure the uniqueness of the ID across the EVC-demarcated Ethernet access domain.

These VLAN IDs are not managed by Prime Provisioning by means of locally-significant VLAN pools. But once a VLAN ID is assigned for a link in the service request, Prime Provisioning makes the VLAN unavailable for subsequent service requests within the Ethernet access domain demarcated by the EVC. Likewise, if a manually-specified VLAN is already in use in the access domain delimited by the EVC, Prime Provisioning will display an error message indicating that the new VLAN ID being specified is already in use on the NPC. The operator will be prompted to specify a different VLAN ID, which will be provisioned on the L2 access nodes.

Table 3-4 VLAN Translation Summary Table

Type	Match Outer Tag	Match Inner Tag	Translate Outer Tag	Translate Inner Tag	Push Outer Tag
1:1	True	N/A	Yes	No	N/A
1:2	True	N/A	N/A	N/A	Yes
2:1	True	True	Yes	No	N/A
2:2	True	True	Yes	Yes	N/A



Note

Table 3-4 summarizes the realization of different VLAN translations available in the EVC infrastructure. The second and third columns (Match Outer Tag and Match Inner Tag) refer to policy settings. The last two columns (Translate Outer Tag and Translate Inner Tag) indicate the VLAN translation that occurs on the incoming frames.

Interface Attributes Window

Table 3-5 describes the attributes available in the EVC Attributes window of EVC Ethernet policy workflow. The attributes you can configure in this window are grouped under the following categories:

- UNI Information
- VLAN
- Pseudowire
- ACL
- Security
- UNI Storm Control
- Protocol

In some cases, checking an attribute causes additional attributes to appear in the GUI.



Note

If the CE is directly connected to an N-PE, only speed, duplex, UNI shutdown, and other generic options are presented. In this case, port security, storm control, L2 protocol tunneling, and other advanced features are not supported due to the current platform limitations. If these features are needed for a service, the service provider must deploy Layer 2 Ethernet access nodes beyond the EVC to support these requirements.

**Note**

Attributes available in the Interface Attributes window dynamically change based on the choice made for the MPLS Core Connectivity Type (PSEUDOWIRE, LOCAL, or VPLS) in the Service Options window (see [Defining the EVC Ethernet Policy, page 3-20](#)). For completeness, all attributes available for the different core types are listed in the table. Attributes apply to all core types, unless otherwise noted.

Table 3-5 *Interface Attributes*

Attribute	Description
Standard UNI Port	Check the box to enable port security. This is the default. When you uncheck the check box, the port is treated as an uplink with no security features, and the window dynamically changes to eliminate items related to port security.
UNI Shutdown	Check the box if you want to leave the UNI port shut during service activation, for example, when the service provider wants to deploy a service in the network but wants to activate it at a later time.
Keep Alive	Check the box to configure keepalives on the UNI port. By default, this check box is unchecked, which causes the command no keepalive to be provisioned on the UNI port. This prevents a CPE from sending keepalive packets to the U-PE, for security purposes. This attribute is editable, in order to support modification on a per-service request basis.
Link Media (optional)	Enter None, auto-select, rj45, or sfp.
Link Speed (optional)	Enter None, 10, 100, 1000, Auto, or nonegotiate.
Link Duplex (optional)	Enter None, Full, Half, or Auto.
Encapsulation	Choose a type. The choices are: <ul style="list-style-type: none"> • DOT1QTRUNK—Configures the UNI as a trunk with 802.1q encapsulation. If the UNI belongs to a directly connected and EVC link, this setting signifies that the incoming frames are 802.1q encapsulated and that they match the VLAN ID configured for the link. This specific topology does not involve a trunk UNI as such. • DOT1QTUNNEL—Configures the UNI as an 802.1q tunnel (also known as a dot1q tunnel or Q-in-Q) port. • ACCESS—Configures the UNI as an access port.
VLAN Translation	Specify the type for this policy by clicking the appropriate radio button. The choices are: <ul style="list-style-type: none"> • No—No VLAN translation is performed. (This is the default.) • 1:1—1:1 VLAN translation. Translates an incoming customer VLAN to another. • 2:1—2:1 VLAN translation. Converts both inner and outer VLANs to a single VLAN. • 1:2—1:2 VLAN translation. Pushes one more provider VLAN. • 2:2—2:2 VLAN translation. Translates both inner and outer VLANs to two other VLANs. <p>For more details on how VLAN translation is supported in EVC Ethernet services, see the coverage of the VLAN Translation attribute in Managing an EVC Ethernet Service Request, page 3-22.</p>

Table 3-5 Interface Attributes (continued)

Attribute	Description
Use PseudoWireClass	<p>Check the box to enable the selection of a pseudowire class. Usage notes:</p> <ul style="list-style-type: none"> The pseudowire class name is used for provisioning pw-class commands on IOS and IOS XR devices. See Creating and Modifying Pseudowire Classes, page 3-15 for additional information on pseudowire class support. If Use PseudoWireClass is checked, an additional attribute, PseudoWireClass, appears in the GUI. Click the Select button of PseudoWireClass attribute to choose a pseudowire class previously created in Prime Provisioning. The Use PseudoWireClass attribute is only available if the MPLS core connectivity type was set as PSEUDOWIRE in the Service Options window (see Defining the EVC Ethernet Policy, page 3-20).
E-Line Name	<p>Specify the point-to-point (p2p) E-line name. Usage notes:</p> <ul style="list-style-type: none"> If no value is specified for the E-Line Name in either the policy or the service request based on the policy, Prime Provisioning autogenerates a default name as follows: <ul style="list-style-type: none"> For PSEUDOWIRE core connectivity type, the format is: <i>DeviceName--VC_ID</i> For LOCAL core connectivity type, the format is: <i>DeviceName--0--VLAN_ID</i> <p>If the default name is more than 32 characters, the device names are truncated.</p> The E-Line Name attribute is not available if the MPLS core connectivity type was set as VPLS in the Service Options window (see Defining the EVC Ethernet Policy, page 3-20). E-Line Name is only applicable for IOS XR devices.
Configure Pseudowire Segments(s)	<p>Check the box to enable ability to configure pseudowire classes on a per segment basis in the service request based on this policy. Usage notes:</p> <ul style="list-style-type: none"> The Configure Pseudowire Segment(s) attribute is only applicable for MPLS core connectivity types of PSEUDOWIRE and VPLS. With a VPLS core type, the attribute shows up in the Service Options window of the Policy Editor. With a PSEUDOWIRE core type, the attribute shows up in the Interface Attributes window in the block of other pseudowire-related attributes. The Configure Pseudowire Segment(s) attribute is used in conjunction with the Static Pseudowire (Autopick MPLS Labels) attribute to configure the individual segments within a multi-segment pseudowire to be either dynamic or static. This allows you to override the default behavior of Prime Provisioning. A segment can be a TP tunnel, a TE tunnel, or an LDP (dynamic) core. The configuration is done subsequently in the service request based on the policy. When setting up the links in the service request, you can independently assign Pseudowire classes to ends of the segments of multi-segment pseudowires. For information on attaching pseudowire classes to links see Configuring Multi-segment Pseudowires, page 3-26. The Configure Pseudowire Segment(s) attribute is not currently supported in EVC ATM-Ethernet Interworking policies and service requests.

Table 3-5 Interface Attributes (continued)

Attribute	Description
N-PE Pseudo-wire on SVI	<p>Check the box to have Prime Provisioning generate forwarding commands under SVIs (switch virtual interfaces). By default, this check box is not checked. In this case, Prime Provisioning generates forwarding commands under the service instance.</p> <p>For an EVC link, the attribute N-PE Pseudo-wire on SVI is dependent on the value of the attribute Configure with Bridge Domain (this is available in the policy workflow in the EVC Policy Editor - Service Options window). N-PE Pseudo-wire on SVI, if enabled, will be reflected only when Configure with Bridge Domain is set to true. Otherwise, the service request will not be created with xconnect under SVI, even if N-PE Pseudo-wire on SVI is enabled.</p> <p>Usage notes:</p> <ul style="list-style-type: none"> • Prime Provisioning supports a hybrid configuration for EVC service requests. In a hybrid configuration, the forwarding commands (such as xconnect) for one side of an attachment circuit can be configured under a service instance, and the xconnect configuration for the other side of the attachment circuit can be configured under a switch virtual interface (SVI). • For examples of these cases, see configlet examples EVC (Pseudowire Core Connectivity, Bridge Domain, Pseudowire on SVI), page 3-164 and EVC (Pseudowire Core Connectivity, no Bridge Domain, no Pseudowire on SVI), page 3-165. • N-PE Pseudo-wire on SVI is applicable for all connectivity types (PSEUDOWIRE, VPLS, and LOCAL), but a hybrid SVI configuration is possible only for pseudowire connectivity. • When MPLS Core Connectivity Type is set as VPLS, the N-PE Pseudo-wire on SVI attribute is always enabled in the policy and service request. • When MPLS Core Connectivity Type is set as LOCAL connectivity type, the N-PE Pseudo-wire on SVI attribute is always disabled in the policy and service request. • The N-PE Pseudo-wire on SVI attribute is not supported for IOS XR devices. Only subinterfaces are supported on ASR 9000 devices; service instance is not supported. All the xconnect commands are configured on L2 subinterfaces. • Table 3-6 shows various use cases for hybrid configuration for EVC service requests.
Use Existing ACL Name	Check the box if you want to assign your own named access list to the port. By default, this check box is not checked and Prime Provisioning automatically assigns a MAC-based ACL on the customer facing UNI port, based on values you enter in UNI MAC addresses (below).
Port-Based ACL Name	Enter a Port-Based ACL Name (if you checked the Use Existing ACL Name check box). Prime Provisioning does not create this ACL automatically. The ACL must already exist on the device, or be added as part of a template, before the service request is deployed. Otherwise, deployment will fail.
UNI MAC addresses	Enter one or more Ethernet MAC addresses. This selection is present only if you uncheck the Use Existing ACL Name check box. Click the Edit button to bring up a pop-up window in which you enter MAC addresses to be allowed or denied on the port. You can also specify a range of addresses by setting a base MAC address and a filtered MAC address.

Table 3-5 Interface Attributes (continued)

Attribute	Description
UNI Port Security	<p>Check the box if you want to provision port security-related CLIs to the UNI port by controlling the MAC addresses that are allowed to go through the interface.</p> <ul style="list-style-type: none"> • For Maximum Number of MAC address, enter the number of MAC addresses allowed for port security. • For Aging, enter the length of time the MAC address can stay on the port security table. • For Violation Action, choose what action will occur when a port security violation is detected: <ul style="list-style-type: none"> – PROTECT—Drops packets with unknown source addresses until a sufficient number of secure MAC addresses are removed to drop below the maximum value. – RESTRICT—Drops packets with unknown source addresses until a sufficient number of secure MAC addresses are removed to drop below the maximum value and causes the Security Violation counter to increment. – SHUTDOWN—Puts the interface into the error-disabled state immediately and sends an SNMP trap notification. • In the Secure MAC Addresses field, enter one or more Ethernet MAC addresses.
Enable Storm Control	<p>Check the box to help prevent the UNI port from being disrupted by a broadcast, multicast, or unicast storm. Enter a threshold value for each type of traffic. The value, which can be specified to two significant digits, represents the percentage of the total available bandwidth of the port. If the threshold of a traffic type is reached, further traffic of that type is suppressed until the incoming traffic falls below the threshold level.</p>
Protocol Tunnelling	<p>Check the box if you want to define the Layer 2 Bridge Protocol Data Unit (BPDU) frames that can be tunneled over the core to the other end. For each protocol that you choose, enter the shutdown threshold and drop threshold for that protocol:</p> <ul style="list-style-type: none"> • Enable cdp—Enable Layer 2 tunnelling on Cisco Discover Protocol (CDP). • cdp shutdown threshold—Enter the number of packets per second to be received before the interface is shut down. • cdp drop threshold—Enter the number of packets per second to be received at which point the interface will start dropping CDP packets. • Enable vtp—Enable Layer 2 tunnelling on VLAN Trunk Protocol (VTP). • vtp shutdown threshold—Enter the number of packets per second to be received before the interface is shut down. • vtp drop threshold—Enter the number of packets per second to be received at which point the interface will start dropping VTP packets. • Enable stp—Enable Layer 2 tunnelling on Spanning Tree Protocol (STP). • stp shutdown threshold—Enter the number of packets per second to be received before the interface is shut down. • stp drop threshold—Enter the number of packets per second to be received at which point the interface will start dropping STP packets. • Recovery Interval—Enter the amount of time, in seconds, to wait before recovering a UNI port.

Table 3-5 Interface Attributes (continued)

Attribute	Description
MTU Size	<p>Enter the MTU Size in bytes. The maximum transmission unit (MTU) size is configurable and optional. The default size is 9216, and the range is 1500 to 9216. Prime Provisioning does not perform an integrity check for this customized value. If a service request goes to the Failed Deploy state because this size is not accepted, you must adjust the size until the Service Request is deployed. In Cisco Prime Fulfillment 1.0, different platforms support different ranges.</p> <ul style="list-style-type: none"> For the 3750 and 3550 platforms, the MTU range is 1500 to 1546. For the Cisco 7600 Ethernet port, the MTU size is always 9216. Even with the same platform and same IOS release, different line cards support the MTU differently. For example, older line cards only take an MTU size of 9216 and newer cards support 1500 to 9216. However, Prime Provisioning uses 9216 in both cases. For the Cisco 7600 SVI (interface VLAN), the MTU size is 1500 to 9216. <p>MTU attribute support has been extended to Direct Access Links attribute section for VPLS Core Connectivity for EVC VPLS services. Earlier this attribute was available only in Links with L2 Access Nodes section. This attribute is applicable for both IOS and IOS-XR devices and MTU size range varies for both the devices.</p> <ul style="list-style-type: none"> For the IOS devices, the MTU range is 64-9216. For the IOS-XR devices, the MTU range is 46-65535.

Table 3-6 Use Cases for Hybrid Configuration for EVC Service Requests

Use Bridge Domain	EVC	N-PE Pseudowire on SVI	CLIs Generated
True	True	True	<ul style="list-style-type: none"> xconnect under VLAN interface. Service instance under main interface.
True	True	False	<ul style="list-style-type: none"> xconnect under service instance. Service instance under main interface.
False	True	N/A	<ul style="list-style-type: none"> xconnect under service instance. Service instance under main interface.
True	False	True	xconnect under VLAN interface.
True	False	False	xconnect under subinterface.
False	False	False	xconnect under subinterface.

EVC Ethernet Service Request Attributes

This section provides information about attributes available in the EVC Ethernet service request workflow:

- [Table 3-7, “Pseudowire Core Connectivity Attributes,” on page 73](#)
- [Table 3-8, “VPLS Core Connectivity Attributes,” on page 75](#)
- [Table 3-9, “Local Core Connectivity Attributes,” on page 78](#)

- [Table 3-10, “Service Instance Details Attributes,” on page 79](#)
- [Table 3-11, “Standard UNI Attributes,” on page 85](#)

Table 3-7 Pseudowire Core Connectivity Attributes

Attribute	Description
Job ID, SR ID	These fields are read-only. When the service request is being created for the first time, the fields display a value of NEW. When an existing service request is being modified, the values of the fields indicate the respective IDs that the Prime Provisioning database holds within the editing flow of the service request.
Policy	This field is read-only. It displays the name of the policy on which the service request is based. Clicking on the read-only policy name displays a list of all the attribute values set within the policy.
Select VPN	<p>Click to choose a VPN for use with this service request. The Select VPN window appears with the VPNs defined in the system.</p> <p>The same VPN can be used by service requests with LOCAL and PSEUDOWIRE core types. If a VPN for a service request is used with VPLS core type, the same VPN cannot be used for service requests with LOCAL or PSEUDOWIRE core type.</p> <ol style="list-style-type: none"> 1. Choose a VPN Name in the Select column. You may also use the New VPN Details section of the window to create a new VPN “on the fly.” This window provides a subset of the usual VPN creation features. Use the supplied fields to name the new VPN, select/create the customer, and so on. For more information about creating VPNs, see Setting Up Logical Inventory, page 2-53. 2. Click Select. <p>The EVC Service Request Editor window appears with the VPN name displayed.</p>
AutoPick VC ID	Check the box if you want Prime Provisioning to choose a VC ID. If you do not check this check box, you will be prompted to provide the ID in the VC ID field, as covered in the next step. When AutoPick VC ID is checked, Prime Provisioning allocates a VC ID for pseudowires from the Prime Provisioning-managed VC ID resource pool. In this case, the text field for the VC ID option is non-editable.
VC ID	<p>If AutoPick VC ID was unchecked, enter a VC ID in the VC ID field. Usage notes:</p> <ul style="list-style-type: none"> • The VC ID value must be an integer value corresponding to a VC ID. • When a VC ID is manually allocated, Prime Provisioning verifies the VC ID to see if it lies within Prime Provisioning’s VC ID pool. If the VC ID is in the pool but not allocated, the VC ID is allocated to the service request. If the VC ID is in the pool and is already in use, Prime Provisioning prompts you to allocate a different VC ID. If the VC ID lies outside of the Prime Provisioning VC ID pool, Prime Provisioning does not perform any verification about whether or not the VC ID allocated. The operator must ensure the VC ID is available. • The VC ID can be entered only while creating a service. If you are editing the service request, the VC ID field is not editable.

Table 3-7 Pseudowire Core Connectivity Attributes (continued)

Attribute	Description
Enable PseudoWire Redundancy	<p>Check the box to enable pseudowire redundancy (alternative termination device) under certain conditions. Usage notes:</p> <ul style="list-style-type: none"> • Enable Pseudo Wire Redundancy is only available if the MPLS Core Connectivity Type was set as PSEUDOWIRE in the Service Options window (see Defining the EVC Ethernet Policy, page 3-20). • Enabling this feature allows the user to do the following: <ul style="list-style-type: none"> – Configure two pseudowires between two direct links, or: – Add a backup peer such that pseudowires are configured between A–Z and A–Z'. In this case, the terminating links A, Z, and Z' must all be directly connected links. L2 access links are not supported as backup peers. • See Setting Up Pseudowire Redundancy and a Backup Peers, page 3-28, for more information on using this feature in service requests. • See Appendix B, “Terminating an Access Ring on Two N-PEs” and, specifically, the section Using N-PE Redundancy in FlexUNI/EVC Service Requests, page B-3, for notes on how this option can be used.
Backup PW VC ID	<p>If the AutoPick VC ID attribute was unchecked, enter a VC ID for the backup pseudowire in the Backup PW VC ID field. See the usage notes for the AutoPick VC ID attribute above. The backup VC ID behaves the same as the VC ID of the primary pseudowire.</p>
Static Pseudowire (Autopick MPLS Labels)	<p>Choose a type. The choices are:</p> <ul style="list-style-type: none"> • All Dynamic—Labels will be allocated dynamically during provisioning. No static labels will be added into the configlet. • All Static—Labels will be allocated statically during provisioning. Every segment in a multi-segment pseudowire will have static labels assigned to it on per-segment basis. • Defaults—Prime Provisioning will automatically determine whether or not to apply static labels based on the core type of the segment. It will do this on a per segment basis. A multi-segment pseudowire over LDP defaults to dynamic pseudowire. Multi-segment pseudowire over MPLS-TP defaults to static pseudowire. <p>This attribute only supported for MPLS Core Connectivity Types of PSEUDOWIRE or VPLS.</p>

Table 3-7 Pseudowire Core Connectivity Attributes (continued)

Attribute	Description
Configure Bridge Domain	<p>Check the box to determine bridge domain characteristics. The behavior of the Configure Bridge Domain option works in tandem with the choice you selected in the MPLS Core Connectivity Type option in the EVC policy, which in this case is pseudowire core connectivity. There are two cases:</p> <ul style="list-style-type: none"> • With EVC: <ul style="list-style-type: none"> – If Configure With Bridge Domain is checked, the policy will configure pseudowires under SVIs associated to the bridge domain. – If Configure With Bridge Domain is unchecked, the policy will configure pseudowires directly under the service instance. This will conserve the global VLAN. • Without EVC: <ul style="list-style-type: none"> – If Configure With Bridge Domain is checked, the policy will configure pseudowires under SVIs. – If Configure With Bridge Domain is unchecked, the policy will configure pseudowires directly under subinterfaces. <p>Pseudowires can be configured either directly under service instance of the corresponding EVC-capable interface or under SVIs associated to the bridge domain.</p>
Use Split Horizon	<p>Check the box to enable split horizon with bridge domain. Usage notes:</p> <ul style="list-style-type: none"> • The Use Split Horizon attribute is disabled by default. • The Use Split Horizon attribute can be used only when the Configure Bridge Domain check box is checked (enabled). • When Use Split Horizon is enabled, the bridge domain command in the CLI will be generated with split horizon. When it is disabled, the bridge domain command will be generated without split horizon.
Description	<p>Click the “Click here” link to enter a description label for the service request. This is useful for searching the Prime Provisioning database for the particular service request. A dialogue appears in which you can enter a description.</p>

Table 3-8 VPLS Core Connectivity Attributes

Attribute	Description
Job ID, SR ID	<p>These fields are read-only. When the service request is being created for the first time, the fields display a value of NEW. When an existing service request is being modified, the values of the fields indicate the respective IDs that the Prime Provisioning database holds within the editing flow of the service request.</p>
Policy	<p>This field is read-only. It displays the name of the policy on which the service request is based.</p>

Table 3-8 VPLS Core Connectivity Attributes (continued)

Attribute	Description
Select VPN	<p>Click Select VPN to choose a VPN for use with this service request. The Select VPN window appears with the VPNs defined in the system.</p> <p>The same VPN can be used by service requests with LOCAL and PSEUDOWIRE core types. If a VPN for a service request is used with VPLS core type, the same VPN cannot be used for service requests with LOCAL or PSEUDOWIRE core type. If the same VPN is used among multiple service requests, all having VPLS core type, then all these service requests participate in the same VPLS service.</p> <ol style="list-style-type: none"> 1. Choose a VPN Name in the Select column. You may also use the New VPN Details section of the window to create a new VPN “on the fly.” This window provides a subset of the usual VPN creation features. Use the supplied fields to name the new VPN, select/create the customer, and so on. For more information about creating VPNs, see Setting Up Logical Inventory, page 2-53. 2. Click Select. <p>The EVC Service Request Editor window appears with the VPN name displayed.</p>
AutoPick VPLS VPN ID	<p>Check the box if you want Prime Provisioning to choose a VPLS VPN ID. If you do not check this check box, you will be prompted to provide the VPN ID in the VPLS VPN ID field, as covered in the next step.</p> <ul style="list-style-type: none"> • When AutoPick VPLS VPN ID is checked, Prime Provisioning allocates a VPLS VPN ID from the Prime Provisioning-managed VC ID resource pool. In this case, the text field for the VPLS VPN ID option is non-editable. • If AutoPick VPLS VPN ID is checked and a service request already exists that refers to same VPN object, the VPLS VPN ID of the existing service request is allocated to the new service request.
VPLS VPN ID	<p>If AutoPick VPLS VPN ID was unchecked, enter a VPLS VPN ID in the VPLS VPN ID field. Usage notes:</p> <ul style="list-style-type: none"> • The VPLS VPN ID value must be an integer value corresponding to a VPN ID. • When a VPLS VPN ID is manually allocated, Prime Provisioning verifies the VPLS VPN ID to see if it lies within Prime Provisioning’s VC ID pool. If the VPLS VPN ID is in the pool but not allocated, the VPLS VPN ID is allocated to the service request. If the VPLS VPN ID is in the pool and is already in use, Prime Provisioning prompts you to allocate a different VPLS VPN ID. If the VPLS VPN ID lies outside of the VC ID pool, Prime Provisioning does not perform any verification about whether the VPLS VPN ID allocated. The operator must ensure the VPLS VPN ID is available. • The VPLS VPN ID can be entered only while creating a service. If you are editing the service request, the VPLS VPN ID field is not editable.

Table 3-8 VPLS Core Connectivity Attributes (continued)

Attribute	Description
AutoPick VFI Name	<p>Check the box if you want Prime Provisioning to choose a virtual forwarding instance (VFI) name. If you do not check this check box, you can provide the VFI name in the VFI Name field, as covered in the next step. Usage notes:</p> <ul style="list-style-type: none"> When AutoPick VFI name is checked, Prime Provisioning generates a VFI name in the following format: <i>VPN name-VC ID</i> <p> Note When the VFI name is automatically generated, any special characters associated with the VPN name, such as '&' ';' and '.', are converted into '_'</p> <ul style="list-style-type: none"> This attribute is useful when importing an existing service into Prime Provisioning and mapping it to a service request which has been created for this purpose. Manually specifying the VFI name in the service request allows the VFI name to be matched to that of existing service.
VFI Name	If AutoPick VFI Name was unchecked, enter a VFI name in the VFI Name field.
Discovery Mode	<p>Choose the type for VPLS autodiscovery. The choices are:</p> <ul style="list-style-type: none"> Manual—Does not provision VPLS autodiscovery on VPLS PE devices configured by the service request. In this case, when a new PE is device is added or removed from the VPLS domain, manual configuration of each neighbor in the VPLS domain is required. Auto Discovery—Provisions VPLS autodiscovery on VPLS PE devices configured by the service request. With VPLS autodiscovery enabled, neighbor devices automatically detect when PEs are added or removed from the VPLS domain. <p>For details on how this feature is supported in Prime Provisioning, device preconfiguration requirements, and limitations, see Provisioning VPLS Autodiscovery on Devices using EVC Service Requests, page 3-52.</p>
Static Pseudowire (Autopick MPLS Labels)	<p>Choose a type. The choices are:</p> <ul style="list-style-type: none"> All Dynamic—Labels will be allocated dynamically during provisioning. No static labels will be added into the configlet. All Static—Labels will be allocated statically during provisioning. Every segment in a multi-segment pseudowire will have static labels assigned to it on per-segment basis. Defaults—Prime Provisioning will automatically determine whether or not to apply static labels based on the core type of the segment. It will do this on a per segment basis. <p>This attribute only supported for MPLS Core Connectivity Types of PSEUDOWIRE or VPLS.</p>
Configure Bridge Domain	<p>The box is checked by default and cannot be changed. Usage notes:</p> <ul style="list-style-type: none"> For VPLS, all configurations are under the SVI. When the EVC feature is used, all configurations are under the SVI and also associated to a bridge domain.
Description	Click the “Click here” link to enter a description label for the service request. A dialogue appears in which you can enter a description.

Table 3-9 Local Core Connectivity Attributes

Attributes	Description
Job ID, SR ID	These fields are read-only. When the service request is being created for the first time, the fields display a value of NEW. When an existing service request is being modified, the values of the fields indicate the respective IDs that the Prime Provisioning database holds within the editing flow of the service request.
Policy	This field is read-only. It displays the name of the policy on which the service request is based.
Select VPN	<p>Click Select VPN to choose a VPN for use with this service request. The Select VPN window appears with the VIPs defined in the system.</p> <p>The same VPN can be used by service requests with LOCAL and PSEUDOWIRE core types. If a VPN for a service request is used with VPLS core type, the same VPN cannot be used for service requests with LOCAL or PSEUDOWIRE core type.</p> <ol style="list-style-type: none"> 1. Choose a VPN Name in the Select column. <p>You may also use the New VPN Details section of the window to create a new VPN “on the fly.” This window provides a subset of the usual VPN creation features. Use the supplied fields to name the new VPN, select/create the customer, and so on. For more information about creating VIPs, see Setting Up Logical Inventory, page 2-53.</p> 2. Click Select. <p>The EVC Service Request Editor window appears with the VPN name displayed.</p>
Configure Bridge Domain	<p>Check the box to determine bridge domain characteristics. Usage notes:</p> <ul style="list-style-type: none"> • If Configure Bridge Domain is checked, all links will have the same bridge domain ID allocated from the VLAN pool on the N-PE. All non-EVC links will have the Service Provider VLAN as the bridge domain ID. On the other hand, if no EVC links are added, the Service Provider VLAN will be allocated first and this will be used as the bridge domain ID when EVC links are added. • If Configure Bridge Domain is unchecked, a maximum of two links that terminate on the same N-PE can be added. (This uses the connect command available in the EVC infrastructure.) See the following comments for details on how Prime Provisioning degenerates the connect name. <p>Because the device only accepts a maximum of 15 characters for the connect name, the connect name is generated using the following format:</p> <p style="text-align: center;"><i>CustomerNameTruncatedToMaxPossibleCharacters_ServiceRequestJobID</i></p> <p>For example, if the customer name is North American Customer and the service request job ID is 56345, the degenerated connect name would be NorthAmer_56345.</p> <p>The CLI generated would be:</p> <pre>connect NorthAmer_56345 GigabitEthernet7/0/5 11 GigabitEthernet7/0/4 18</pre> <p>In this case, 11 and 18 are service instance IDs.</p> <ul style="list-style-type: none"> • If the policy setting for Configure Bridge Domain is non-editable, the option in the service request will be read-only.

Table 3-9 Local Core Connectivity Attributes (continued)

Attributes	Description
Use Split Horizon	<p>Check the box to enable split horizon with bridge domain. Usage notes:</p> <ul style="list-style-type: none"> The Use Split Horizon attribute is disabled by default. The Use Split Horizon attribute can be used only when the Configure Bridge Domain check box is checked (enabled). When Use Split Horizon is enabled, the bridge domain command in the CLI will be generated with split horizon. When it is disabled, the bridge domain command will be generated without split horizon.
Description	Click the “Click here” link to enter a description label for the service request. A dialogue appears in which you can enter a description.

Table 3-10 Service Instance Details Attributes

Attribute	Description
Ectopic Service Instance ID	<p>Check the box to specify that the service instance ID will be degenerated and allocated to the link during service request creation. If the check box is unchecked, you must specify the service instance ID (see the next step). Usage notes:</p> <ul style="list-style-type: none"> The service instance ID represents an Ethernet Flow Point (EFP) on an interface in the EVC infrastructure. The service instance ID is locally significant to the interface. This ID has to be unique only at the interface level. The ID must be a value from 1 to 8000. There are no resource pools available in Prime Provisioning from which to allocate the service instance IDs. In the case of a manually provided service instance ID, it is the responsibility of the operator to maintain the uniqueness of the ID at the interface level. This attribute is not displayed for IOS XR devices.
Service Instance ID	If the AutoPick Service Instance ID check box is not checked, enter an appropriate value for the service instance ID in the Service Instance ID field. This attribute is not displayed for IOS XR devices.
AutoPick Service Instance Name	<p>Check the box to specify that the service instance name will be autogenerated. If the check box is unchecked, you can specify the service instance name (see the next step). Usage notes:</p> <ul style="list-style-type: none"> If the check box is checked, the Service Instance Name text field is disabled. The service instance name is autogenerated in the following pattern: <i>CustomerName_ServiceRequestJobID</i>. For example configlets, see EVC (AutoPick Service Instance Name), page 3-166, EVC (Pseudowire Core Connectivity, User-Provided Service Instance Name), page 3-168, and EVC (Local Core Connectivity, User-Provided Service Instance Name), page 3-181. This attribute is not displayed for IOS XR devices.

Table 3-10 Service Instance Details Attributes (continued)

Attribute	Description
Enable Trunk EFP	<p>Check the box to provide flexibility to make many Layer 2 flow points within one interface. This attribute appears only when the EVC check box is checked in Direct Connect Links section. Trunk EFP supports only ASR920 IOS device. Usage notes:</p> <ul style="list-style-type: none"> • If the check box is checked, user will get “service instance trunk <id> ethernet” command. • If the check box is checked, the Match Inner and Outer Tags are disabled. • If the check box is checked, Autopick Outer VLAN and single value Outer VLAN are not allowed. • If the check box is checked, Outer VLAN ID only with ranges is allowed.
Service Instance Name	<p>If the AutoPick Service Instance Name check box is not checked, enter an appropriate value for the service instance ID in the Service Instance Name field. Usage notes:</p> <ul style="list-style-type: none"> • The text string representing the service instance name must be 40 characters or less and contain no spaces. Other special characters are allowed. • If AutoPick Service Instance Name is unchecked and no service instance name is entered in the text field, then Prime Provisioning does not generate the global ethernet evc evcname command in the device configuration generated by the service request.
AutoPick Bridge Domain/VLAN ID	<p>Check the box to have Prime Provisioning autopick the VLAN ID for the service request during service request creation. If this check box is unchecked, the you must specify a bridge domain VLAN ID. Usage notes:</p> <ul style="list-style-type: none"> • AutoPick Bridge Domain/VLAN ID consumes a global VLAN ID on the device. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool.
Bridge Domain/VLAN ID	<p>If the AutoPick Bridge Domain/VLAN ID check box is unchecked, enter an appropriate value in the Bridge Domain/VLAN ID field.</p> <p>This configuration applies in conjunction with the Configure Bridge Domain option in the EVC Service Request Editor window. If the option is not enabled in that window, then AutoPick Bridge Domain/VLAN ID check box is redundant and not required.</p> <p>When a VLAN ID is manually allocated, Prime Provisioning verifies the VLAN ID to see if it lies within Prime Provisioning’s VLAN ID pool. If the VLAN ID is in the pool but not allocated, the VLAN ID is allocated to the service request. If the VLAN ID is in the pool and is already in use, Prime Provisioning prompts you to allocate a different VLAN ID. If the VLAN ID lies outside of the Prime Provisioning VLAN ID pool, Prime Provisioning does not perform any verification about whether the VLAN ID allocated. The operator must ensure the VLAN ID is available.</p>

Table 3-10 Service Instance Details Attributes (continued)

Attribute	Description
AutoPick Bridge Domain/VLAN ID Secondary N-PE	<p>Check the box to have Prime Provisioning autopick the bridge domain VLAN ID for the secondary N-PE of a dual-homed ring during service request creation. If this check box is unchecked, the you must specify a secondary bridge domain VLAN ID for the secondary N-PE.</p> <p>Usage notes:</p> <ul style="list-style-type: none"> • This attribute is only applicable in the case of a dual-homed ring (a ring that terminates on two different N-PEs). Prime Provisioning supports having a separate bridge domain VLAN ID for the secondary N-PE. • In a dual-homed ring, if the two N-PEs are in different access domains, Prime Provisioning allocates the bridge domain VLAN IDs from both primary and secondary N-PE access domains. When both are in the same Access Domain, Prime Provisioning allocates a common VLAN ID from the Access Domain to which these belong. • AutoPick Bridge Domain/VLAN ID Secondary N-PE consumes a global VLAN ID on the device. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool. • This attribute is not displayed for IOS XR devices.
Bridge Domain/VLAN ID Secondary N-PE	<p>If the AutoPick Bridge Domain/VLAN ID Secondary N-PE check box is unchecked, enter an appropriate value in the Bridge Domain/VLAN ID Secondary N-PE field.</p>
Match	<p>Choose an encapsulation type from the drop-down list. The choices are:</p> <ul style="list-style-type: none"> • DOT1Q • DEFAULT • UNTAGGED • PRIORITY TAGGED • DOT1AD <p>Selecting Default as the match criteria disables the Outer VLAN ID and Outer VLAN Ranges fields on the page. If Default is the CE encapsulation type, Prime Provisioning shows another field for the UNI port type.</p>
Match Inner and Outer Tags	<p>Check the box to enable service requests created with the policy to match both the inner and outer VLAN tags of the incoming frames. If you do not check this check box, service requests created with the policy will match only the outer VLAN tag of the incoming frames. Checking the Match Inner and Outer Tags attribute causes the Inner VLAN ID and Outer VLAN ID fields (covered in the next steps) to appear.</p>

Table 3-10 Service Instance Details Attributes (continued)

Attribute	Description
Inner VLAN ID and Outer VLAN ID	<p>If the Match Inner and Outer Tags check box is checked, enter the inner and outer VLAN tags in the Inner VLAN ID and Outer VLAN ID fields. Usage notes:</p> <ul style="list-style-type: none"> • You can specify single values, single ranges, multiples values, multiple ranges, or combinations of these. Examples: <ul style="list-style-type: none"> – 10 – 10, 15,17 – 10-15 – 10-15,17-20 – 10,20-25 • If the Inner VLAN Ranges attribute is set to true in the policy, the Inner VLAN ID field can take a range of inner VLAN tags. • If the Outer VLAN Ranges attribute is set to true in the policy, the Outer VLAN ID field can take a range of Outer VLAN tags.
Outer VLAN ID	<p>If the Match Inner and Outer Tags check box is unchecked, enter the outer VLAN tag in the Outer VLAN ID field. Usage notes:</p> <ul style="list-style-type: none"> • The VLAN specified in Outer VLAN ID will be provisioned on the rest of the L2 access nodes (if the link has any), including the customer-facing UNI. • You may also have Prime Provisioning autopick the outer VLAN ID using the AutoPick Outer VLAN attribute.
Inner VLAN ID	<p>If the Match Inner and Outer Tags check box is checked, enter both the inner and outer VLAN tags in the Inner VLAN ID and Outer VLAN ID fields. Usage notes:</p> <ul style="list-style-type: none"> • The VLAN specified in Inner VLAN ID will be provisioned on the rest of the L2 access nodes (if the link has any), including the customer-facing UNI. • You may also have Prime Provisioning autopick the inner VLAN ID using the AutoPick Inner VLAN attribute.
AutoPick Outer VLAN	<p>Check the box to have Prime Provisioning autopick the outer VLAN ID from a previously created outer VLAN ID resource pool. If this check box is unchecked, the operator will be prompted to specify an outer VLAN ID. Usage notes:</p> <ul style="list-style-type: none"> • Use of the AutoPick Outer VLAN attribute requires that two elements have already been set up in Prime Provisioning. One is an Interface Access Domain, which is a logical element that groups the physical ports of an N-PE device. The other is an EVC Outer VLAN resource pool, which is used by the Interface Access Domain. For instructions on how to set up these elements, see the sections Setting Up Resources, page 2-39, and Resource Pools, page 2-43. • AutoPick Outer VLAN can be used for interfaces that support EVC functionality • AutoPick Outer VLAN consumes a VLAN ID on the interface that supports EVC. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool.

Table 3-10 Service Instance Details Attributes (continued)

Attribute	Description
AutoPick Inner VLAN	<p>Check the box to have Prime Provisioning autopick the Inner VLAN ID from a previously created Inner VLAN ID resource pool during service request creation. If this check box is unchecked, the operator will be prompted to specify an Inner VLAN ID during service request creation. Usage notes:</p> <ul style="list-style-type: none"> • Use of the AutoPick Inner VLAN attribute requires that two elements have already been set up in Prime Provisioning. One is an Interface Access Domain, which is a logical element that groups the physical ports of an N-PE device. The other is an EVC Inner VLAN resource pool, which is used by the Interface Access Domain. For instructions on how to set up these elements, see the sections Setting Up Resources, page 2-39, and Resource Pools, page 2-43. • AutoPick Inner VLAN can be used for interfaces that support EVC functionality. • AutoPick Inner VLAN consumes a VLAN ID on the interface that supports EVC. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool. <p> Note The Match Inner and Outer Tags check box should be enabled in the policy to make use of AutoPick Inner VLAN feature during service request creation.</p>
Rewrite Type	<p>Choose a type from the drop-down list. The choices are:</p> <ul style="list-style-type: none"> • Pop • Push • Translate <p>The subsequent attributes in the GUI change depending on the choice of Rewrite Type.</p>
	<p>If Pop is the Rewrite Type, two check boxes appear:</p> <ol style="list-style-type: none"> a. Check the Pop Outer Tag check box to pop the outer VLAN ID tag of the incoming frames that fulfill the match criteria. If this check box is unchecked, the outer tag of the incoming traffic will not be popped. b. Check the Pop Inner Tag check box to pop the inner VLAN ID tag of the incoming frames that fulfill the match-criteria. If this check box is unchecked, the inner tag will not be changed. <p>Note that if Pop Inner Tag is checked, Pop Outer Tag is automatically checked.</p>
	<p>If Push is the Rewrite Type, two text boxes appear:</p> <ol style="list-style-type: none"> a. In the text box Outer VLAN ID, enter an outer VLAN ID tag that will be imposed on the incoming frames that fulfill the match criteria. All service requests created with this setting push a dot1q outer tag on the incoming frames matching the match criteria. If a value is not provided, the push operation is ignored and not configured on the device. b. In the text box Inner VLAN ID, enter an inner VLAN ID tag that will be imposed on the incoming frames that fulfill the match criteria. All service requests created with this setting push a dot1q inner tag on the incoming frames matching the match criteria. The Inner VLAN tag cannot be pushed without an Outer VLAN tag. That is, when pushing an Inner VLAN tag, the Outer VLAN tag also must be defined.

Table 3-10 Service Instance Details Attributes (continued)

Attribute	Description
	<p>If Translate is the Rewrite Type, a Translation Type drop-down list appears. The choices available in this list vary depending on the setting of the Match Inner and Outer Tags attribute.</p> <ol style="list-style-type: none"> <li data-bbox="423 444 1492 725"> <p>a. If the Match Inner and Outer Tags check box is checked (true), choose a translation type of 1:1, 1:2, 2:1, or 2:2 from the Translation Type drop-down list.</p> <ul style="list-style-type: none"> <li data-bbox="483 522 1492 614">– If you choose 1:1 or 2:1, enter a value in the Outer VLAN ID text box that appears. The outer tag of all the incoming frames that fulfill the match criteria will be translated to this ID. <li data-bbox="483 632 1492 725">– If you choose 1:2 or 2:2, enter values in the Outer VLAN ID and Inner VLAN ID text boxes that appear. The outer and inner tags of all the incoming frames that fulfill the match criteria will be translated to these IDs. <li data-bbox="423 743 1492 986"> <p>b. If the Match Inner and Outer Tags check box is unchecked (false), choose a translation type of 1:1 or 1:2 from the Translation Type drop-down list.</p> <ul style="list-style-type: none"> <li data-bbox="483 820 1492 880">– If you choose 1:1, enter a value in the Outer VLAN ID text box that appears. The outer tag of all the incoming frames that fulfill the match criteria will be translated to this ID. <li data-bbox="483 898 1492 986">– If you choose 1:2, enter values in the Outer VLAN ID and Inner VLAN ID text boxes that appear. The outer and inner tags of all the incoming frames that fulfill the match criteria will be translated to these IDs.

Table 3-11 Standard UNI Attributes

Attributes	Description
N-PE/U-PE Information, Interface Name	These fields display the PE device and interface name selected in previous steps. These fields are read-only
Encapsulation	<p>Choose a type from the drop-down list. The choices are:</p> <ul style="list-style-type: none"> • DOT1QTRUNK—Configures the UNI as a trunk with 802.1q encapsulation. If the UNI belongs to a directly connected and EVC link, this setting signifies that the incoming frames are 802.1q encapsulated and that they match the VLAN ID configured for the link. This specific topology does not involve a trunk UNI as such. • DOT1QTUNNEL—Configures the UNI as an 802.1q tunnel (also known as a dot1q tunnel or Q-in-Q) port. • ACCESS—Configures the UNI as an access port. <p>This attribute allows you to deploy different types of UNI encapsulation on different links of a service. Usage notes:</p> <ul style="list-style-type: none"> • When a U-PE running with IOS is added in the same circuit terminating on an ASR 9000 (functioning in an N-PE role), the all three encapsulation types values will be visible in the drop-down list of the Encapsulation attribute. • DOT1QTUNNEL is not directly supported for ASR 9000 devices. • In the case of direct connect links for which EVC is enabled (by checking the EVC check box in the EVC Service Request Editor window), the choices for the Encapsulation type are DOT1Q and DEFAULT.
PE/UNI Interface Description	Enter a description for the interface, if desired.
UNI Shutdown	Check the box if you want to leave the UNI port shut during service activation (for example, when the service provider wants to deploy a service in the network but wants to activate it at a later time).
VLAN Translation	<p>Specify the type of VLAN translation for the service request by clicking the appropriate radio button. The choices are:</p> <ul style="list-style-type: none"> • No—No VLAN translation is performed. (This is the default.) • 1:1—1:1 VLAN translation. • 2:1—2:1 VLAN translation. • 1:2—1:2 VLAN translation. • 2:2—2:2 VLAN translation.

Table 3-11 Standard UNI Attributes (continued)

Attributes	Description
	<p>Usage notes:</p> <ul style="list-style-type: none"> • The VLAN Translation attribute does not appear for direct connect links if the EVC check box is enabled. It does appear for the following combinations: <ul style="list-style-type: none"> – Direct connect links with EVC check box disabled. – L2 access nodes with EVC check box enabled or disabled. • Choosing a selection other than No causes other fields to appear in the GUI, which you can set based on your configuration: <ul style="list-style-type: none"> – CE VLAN—Provide a value between 1 and 4096. – Auto Pick—Check this check box to have Prime Provisioning autopick the outer VLAN from the VLAN resource pool. – Outer VLAN—If Auto Pick is unchecked, provide a value between 1 and 4096. – Select where 2:1 or 2:2 translation takes place—Specify the device where the 2;1 or 2:2 VLAN translation will take place. If you choose Auto, the VLAN translation takes place at the device closest to the UNI port. • VLAN translation, and all standard UNI and port security attributes are applicable for links with L2 access. If the UNI is on an N-PE, these attributes will not appear. • When the VLAN translation takes place on a U-PE or PE-AGG device, the VLAN translation command is configured on the NNI interface of the selected device. When the VLAN translation takes place on an NP-E, the VLAN translation command is configured on the UNI interface of the device. • When there are two NNI interfaces in a ring-based environment, VLAN translation is applied for both of these NNI interfaces. • 1:1 and 2:1 VLAN translations are supported with the same syntax as for non-EVC (switchport-based N-PE syntax) terminating attachment circuits.
N-PE Pseudo-wire on SVI	<p>Check the box to have Prime Provisioning generate forwarding commands under SVIs (switch virtual interfaces). By default, this check box is not checked. In this case, Prime Provisioning generates forwarding commands under the service instance.</p> <p>For an EVC link, the attribute N-PE Pseudo-wire on SVI is dependent on the value of the attribute Configure with Bridge Domain (this is available in the service request workflow in the EVC Service Request Editor window). N-PE Pseudo-wire on SVI, if enabled, will be reflected only when Configure with Bridge Domain is set to true. Otherwise, the service request will not be created with xconnect under SVI, even if N-PE Pseudo-wire on SVI is enabled.</p>

Table 3-11 Standard UNI Attributes (continued)

Attributes	Description
	<p>Usage notes:</p> <ul style="list-style-type: none"> • For an EVC link, the attribute N-PE Pseudo-wire on SVI is dependent on the value of the attribute Configure with Bridge Domain (in the EVC Service Request Editor window). N-PE Pseudo-wire on SVI, if enabled, will be reflected only when Configure with Bridge Domain is set to true. Otherwise, the service request will not be created with xconnect under SVI, even if N-PE pseudo-wire on SVI is enabled. • Prime Provisioning supports a hybrid configuration for EVC service requests. In a hybrid configuration, the forwarding commands (such as xconnect) for one side of an attachment circuit can be configured under a service instance, and the xconnect configuration for the other side of the attachment circuit can be configured under a switch virtual interface (SVI). • N-PE Pseudo-wire on SVI is applicable for all connectivity types (PSEUDOWIRE, VPLS, and LOCAL), but a hybrid SVI configuration is possible only for pseudowire connectivity. • When MPLS Core Connectivity Type is set as VPLS, the N-PE Pseudo-wire on SVI attribute is always enabled in the policy and service request. • When MPLS Core Connectivity Type is set as LOCAL connectivity type, the N-PE Pseudo-wire on SVI attribute is always disabled in the policy and service request. • For examples of these cases, see configlet examples EVC (Pseudowire Core Connectivity, Bridge Domain, Pseudowire on SVI), page 3-164 and EVC (Pseudowire Core Connectivity, no Bridge Domain, no Pseudowire on SVI), page 3-165. • For additional information on the N-PE Pseudo-wire on SVI attribute, see the corresponding coverage in the EVC policy section in the section Interface Attributes Window, page 3-67. • The N-PE Pseudo-wire on SVI attribute is not supported for IOS XR devices. All the xconnect commands are configured on L2 subinterfaces.
AutoPick Bridge Group Name	<p>Check the box to have Prime Provisioning autopick the bridge group name during service request creation. If this check box is unchecked, you are prompted to specify a bridge group name during service request creation (see the next step). Usage notes:</p> <ul style="list-style-type: none"> • This attribute only displays for IOS XR devices. • If the AutoPick Bridge Group Name check box is unchecked, enter an bridge group name in the Bridge Group Name text field. • The AutoPick Bridge Group Name and Bridge Group Name attributes only appear if Configure Bridge Domain was enabled in the EVC Service Request Editor window earlier in the service request workflow.
AutoPick Bridge Domain/VLAN ID	<p>Check the box to have Prime Provisioning autopick the VLAN ID during service request creation. If this check box is unchecked, you are prompted to specify a VLAN ID during service request creation (see the next step). Usage notes:</p> <ul style="list-style-type: none"> • AutoPick Bridge Domain/VLAN ID consumes a global VLAN ID on the device. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool. • The AutoPick Bridge Domain/VLAN ID attribute appears for both Cisco 7600 and ASR 9000 devices. It will be displayed only for non-EVC links.

Table 3-11 Standard UNI Attributes (continued)

Attributes	Description
Bridge Domain/VLAN ID	<p>If the AutoPick Bridge Domain/VLAN ID check box is unchecked, enter an ID number in the Bridge Domain/VLAN ID text field. Usage notes:</p> <ul style="list-style-type: none"> • If AutoPick Bridge Domain/VLAN ID is checked, this field is non-editable. • When a VLAN ID is manually allocated, Prime Provisioning verifies the VLAN ID to see if it lies within Prime Provisioning's VLAN ID pool. If the VLAN ID is in the pool but not allocated, the VLAN ID is allocated to the service request. If the VLAN ID is in the pool and is already in use, Prime Provisioning prompts you to allocate a different VLAN ID. If the VLAN ID lies outside of the Prime Provisioning VLAN ID pool, Prime Provisioning does not perform any verification about whether the VLAN ID allocated. The operator must ensure the VLAN ID is available. • The Bridge Domain/VLAN ID text field appears for both Cisco 7600 and ASR 9000 devices. It will be displayed only for non-EVC links.
AutoPick Bridge Domain Name	<p>Check the box to have Prime Provisioning autopick the bridge domain name during service request creation. If this check box is unchecked, you are prompted to specify a bridge domain name during service request creation (see the next step). Usage notes:</p> <ul style="list-style-type: none"> • The AutoPick Bridge Domain Name attribute appears only for Cisco ASR 9000 devices. • The AutoPick Bridge Domain Name attribute only appears if Configure Bridge Domain was enabled in the EVC Service Request Editor window earlier in the service request workflow.
Bridge Domain Name	<p>If the AutoPick Bridge Domain Name check box is unchecked, enter a bridge domain name in the Bridge Domain Name text field. Usage notes:</p> <ul style="list-style-type: none"> • Bridge Domain Name field appears only for Cisco ASR 9000 devices. • The Bridge Domain Name attribute only appears if Configure Bridge Domain was enabled in the EVC Service Request Editor window earlier in the service request workflow.
Use BVI	<p>Check the box to select a bridge virtual interface (BVI) to provide pseudowire access into an L3VPN. When the Use BVI check box is checked, the Select BVI Interface attribute appears, which provides a drop-down list of available BV Is configured on the device. Usage notes:</p> <ul style="list-style-type: none"> • The Use BVI attribute is only supported for IOS XR devices. (It is equivalent to the N-PE Pseudo-wire on SVI attribute that is supported for IOS devices.) • Note the following prerequisites for using the Use BVI attribute: <ul style="list-style-type: none"> – In order to use this attribute, you must have previously configured L3VPN services on the device. – Such L3VPN services must have created BVI interfaces. (These interfaces are what provides pseudowire access into the L3VPN.) – Furthermore, you must have performed a manual Collect config task for the corresponding N-PE devices in Prime Provisioning so that the L2VPN service would be aware of the BVI interfaces that were configured in the L3VPN. • For example configlets for this feature, see EVC (Pseudowire Core Connectivity, Pseudowire Service with BVI), page 3-179.

Table 3-11 Standard UNI Attributes (continued)

Attributes	Description
Use Split Horizon	<p>Check the box to enable split horizon with bridge domain. Usage notes:</p> <ul style="list-style-type: none"> The Use Split Horizon attribute is disabled by default. The Use Split Horizon attribute can be used only when the Configure Bridge Domain check box is checked (enabled). When Use Split Horizon is enabled, the bridge domain command in the CLI will be generated with split horizon. When it is disabled, the bridge domain command will be generated without split horizon.
Use PseudoWireClass	<p>Check the box to enable the selection of a pseudowire class. This attribute is unchecked by default. Usage notes:</p> <ul style="list-style-type: none"> The pseudowire class name is used for provisioning pw-class commands on IOS and IOS XR devices. See Creating and Modifying Pseudowire Classes, page 3-15 for additional information on pseudowire class support. If Use PseudoWireClass is checked, an additional attribute, PseudoWireClass, appears in the GUI. Click the Select button of PseudoWireClass attribute to choose a pseudowire class previously created in Prime Provisioning. The Use PseudoWireClass attribute is only available if the MPLS core connectivity type was set as PSEUDOWIRE in the Service Options window (see Defining the EVC Ethernet Policy, page 3-20). The Use PseudoWireClass and PseudoWireClass attributes only appear if Configure Bridge Domain was not enabled in the EVC Service Request Editor window earlier in the service request workflow.
L2VPN Group Name	<p>Choose one of the following from the drop-down list:</p> <ul style="list-style-type: none"> ISC VPNSC <p>Usage notes:</p> <ul style="list-style-type: none"> This attribute is used for provisioning the L2VPN group name on IOS XR devices. The choices in the drop-down list are derived from a configurable DCPL property. For information about how to define the L2VPN Group Name choices available in the drop-down list, see Defining L2VPN Group Names for IOS XR Devices, page 3-19. The L2VPN Group Name attribute is not available if the MPLS core connectivity type was set as VPLS in the Service Options window (see Defining the EVC Ethernet Policy, page 3-20). L2VPN Group Name is only applicable for IOS XR devices. The L2VPN Group Name attribute only appears if Configure Bridge Domain was not enabled in the EVC Service Request Editor window earlier in the service request workflow.

Table 3-11 Standard UNI Attributes (continued)

Attributes	Description
E-Line Name	<p>Enter the point-to-point (p2p) E-line name. Usage notes:</p> <ul style="list-style-type: none"> • If no value is specified for the E-Line Name, Prime Provisioning autogenerates a default name as follows: <ul style="list-style-type: none"> – For PSEUDOWIRE core connectivity type, the format is: <i>DeviceName--VC_ID</i> – For LOCAL core connectivity type, the format is: <i>DeviceName--VLAN_ID</i> <p>If the default name is more than 32 characters, the device names are truncated.</p> <ul style="list-style-type: none"> • The E-Line Name attribute is not available if the MPLS core connectivity type was set as VPLS in the Service Options window (see Defining the EVC Ethernet Policy, page 3-20). • E-Line Name is only applicable for IOS XR devices. • The E-Line Name attribute only appears if Configure Bridge Domain was not enabled in the EVC Service Request Editor window earlier in the service request workflow.

EVC ATM-Ethernet Interworking Service Attributes

This section describes policy and service request attributes for EVC ATM-Ethernet services:

- [EVC ATM-Ethernet Interworking Policy Attributes, page 3-90](#)
- [EVC ATM-Ethernet Interworking Service Request Attributes, page 3-104](#)

EVC ATM-Ethernet Interworking Policy Attributes

This section provides reference tables for attributes available in the EVC ATM-Ethernet policy workflow:

- [Service Options Window, page 3-90](#)
- [ATM Interface Attributes Window, page 3-94](#)
- [EVC Attributes Window, page 3-94](#)
- [Interface Attributes Window, page 3-99](#)



Note

Some attributes are supported only on IOS or IOS XR platforms. Attributes apply to both platforms, unless otherwise noted. All platform-specific attributes are visible in the policy workflow windows. Later, when a service request is created based on the policy (and specific devices are associated with the service request), platform-specific attributes are filtered from service request windows, depending on the device type (IOS or IOS XR).

Service Options Window

[Table 3-12](#) describes the attributes in the Service Options Window of the EVC ATM-Interworking policy workflow.

Table 3-12 Service Options

Attribute	Description
CE Directly Connected to EVC	<p>Check the box if the CEs are directly connected to the N-PE. This check box is not checked by default. Usage notes:</p> <ul style="list-style-type: none"> • If the check box is checked, a service request created using this policy can have only directly connected links. No Ethernet access nodes will be involved. • If the check box is unchecked, a service request created using this policy might or might not have Ethernet access nodes in the links. • When a CE is directly connected to the N-PE, NPCs are not applicable to the link while creating service requests. • When a CE is not directly connected to the N-PE, NPCs are used during service request creation, as per standard Prime Provisioning behavior. There is no change in NPC implementation to support EVC functionality.
All Links Terminate on EVC	<p>Check the box if all links need to be configured with EVC features. This check box is not checked by default. Usage notes:</p> <ul style="list-style-type: none"> • If the check box is checked, a service request created using such policy will have all links using the EVC feature. • If the check box is unchecked, zero or more links can use the EVC feature. This ensures that existing platforms can still be used in one or more links while delivering the services. This allows the possibility of a link with EVC support being added in the future. • If the check box is unchecked, in the service request creation process the user must indicate whether or not the created link is EVC or non-EVC. • If no links are expected to use the EVC feature even in the future (for example, if the provider is not planning to upgrade to the EVC infrastructure for the service that is being created), existing Prime Provisioning policy types (L2VPN or VPLS) can be used instead of EVC.
All L2 Access Links default to EVC UNI	<p>Check the box to enable EVC syntax configuration on all access devices (U-PE and PE-AGG) throughout the circuit. This shows up in service request as EVC-related attributes for all of these device types. If this attribute is not enabled, in the service request EVC service-related syntax will only be available for N-PE devices.</p>

Table 3-12 Service Options (continued)

Attribute	Description
MPLS Core Connectivity Type	<p>Choose an MPLS core connectivity type from the drop-down list. The core option supports MPLS only. There is no L2TPv3 support for this service. The choices are:</p> <ul style="list-style-type: none"> • PSEUDOWIRE—Choose this option to allow connectivity between two N-PEs across the MPLS core. This option does not limit the service to point-to-point (E-Line). This is because even with the PSEUDOWIRE option selected, there can still be multiple CEs connected to a bridge domain on one or both sides of the pseudowire. • LOCAL—Choose this option for local connect cases in which there is no connectivity required across the MPLS core. <ul style="list-style-type: none"> Local connect supports the following scenarios: <ul style="list-style-type: none"> – All interfaces on the N-PE are EVC-capable and using the EVC infrastructure. This is configured by associating all of the customer traffic on these interfaces to a bridge domain. This consumes a VLAN ID on the N-PE (equal to the bridge domain ID). – Some interfaces on the N-PE are EVC-capable, while others are switch-port-based. In such cases, all of the customer traffic on the interfaces that are configured with the EVC infrastructure are associated to a bridge domain. The traffic on the non-EVC interfaces (and all the access nodes/interfaces beyond this N-PE) are configured with the Service Provider VLAN ID, where the Service Provider VLAN ID is the same as the bridge domain ID for the EVC-based services. – Only two interfaces on the N-PE are involved, and both are based on EVC-capable line cards. In the first case, the operator might choose not to configure the bridge domain option. In this case, the connect command that is used for the local connects are used, and the global VLAN is conserved on the device. If the operator chooses to configure with the bridge domain option, both interfaces are associated to a bridge domain ID, so that additional local links can be added to the service in future. This consumes a VLAN ID (bridge domain ID) on the N-PE. • VPLS—This option is not supported for EVC ATM-Ethernet Interworking policies and services requests.

Table 3-12 Service Options (continued)

Attribute	Description
Configure With Bridge Domain	<p>Check the box to determine bridge domain characteristics. The behavior of the Configure With Bridge-Domain option works in tandem with the choice you selected in the MPLS Core Connectivity Type option, as follows.</p> <ul style="list-style-type: none"> • PSEUDOWIRE as the MPLS Core Connectivity Type. There are two cases: <ul style="list-style-type: none"> A. With EVC: <ul style="list-style-type: none"> – If Configure With Bridge Domain is checked, the policy configures pseudowires under SVIs associated to the bridge domain. – If Configure With Bridge Domain is unchecked, the policy will configure pseudowires directly under the service instance. This conserves the global VLAN. B. Without EVC: <ul style="list-style-type: none"> – If Configure With Bridge Domain is checked, the policy configures pseudowires as in L2VPN services (with SVIs). – If Configure With Bridge Domain is unchecked, the policy configures pseudowires directly under subinterfaces. <p>Only pseudowires can be either configured directly under service instance of the corresponding EVC-capable interface or under SVIs associated to the bridge domain.</p> <ul style="list-style-type: none"> • LOCAL as the MPLS Core Connectivity Type: <ul style="list-style-type: none"> – If Configure With Bridge Domain is checked, the policy allows either point-to-point or multipoint local connect services. – If Configure With Bridge Domain is unchecked, Prime Provisioning allows only point-to-point local connects without bridge domain.
Split Horizon	<p>Check the box to enable split horizon with bridge domain. Usage notes:</p> <ul style="list-style-type: none"> • The Use Split Horizon attribute is disabled by default. • The Use Split Horizon attribute can be used only when the Configure With Bridge Domain check box is checked (enabled). • When Split Horizon is enabled, the bridge domain command in the CLI will be generated with split horizon. When it is disabled, the bridge domain command will be generated without split horizon.
Static Pseudowire (Autopick MPLS Labels)	<p>Choose a type. The choices are:</p> <ul style="list-style-type: none"> • All Dynamic—Labels will be allocated dynamically during provisioning. No static labels will be added into the configlet. • All Static—Labels will be allocated statically during provisioning. Every segment in a multi-segment pseudowire will have static labels assigned to it on per-segment basis. • Defaults—Prime Provisioning will automatically determine whether or not to apply static labels based on the core type of the segment. It will do this on a per segment basis. <p>This attribute only supported for MPLS Core Connectivity Types of PSEUDOWIRE or VPLS.</p>

Table 3-12 Service Options (continued)

Attribute	Description
Configure Pseudowire Segment(s)	<p>Check the box to enable ability to configure pseudowire classes on a per segment basis in the service request based on this policy. Usage notes:</p> <ul style="list-style-type: none"> The Configure Pseudowire Segment(s) attribute is only applicable for MPLS core connectivity types of PSEUDOWIRE and VPLS. With a VPLS core type, the attribute shows up in the Service Options window of the Policy Editor. With a PSEUDOWIRE core type, the attribute shows up in the Interface Attributes window in the block of other pseudowire-related attributes. The Configure Pseudowire Segment(s) attribute is used in conjunction with the Static Pseudowire (Autopick MPLS Labels) attribute to configure the individual segments within a multi-segment pseudowire to be either dynamic or static. This allows you to override the default behavior of Prime Provisioning. A segment can be a TP tunnel, a TE tunnel, or an LDP (dynamic) core. The configuration is done subsequently in the service request based on the policy. When setting up the links in the service request, you can independently assign Pseudowire classes to ends of the segments of multi-segment pseudowires. For information on attaching pseudowire classes to links. The Configure Pseudowire Segment(s) attribute is not currently supported in EVC ATM-Ethernet Interworking policies and service requests.

ATM Interface Attributes Window

Table 3-13 describes the attributes in the ATM Interface Attributes Window of the EVC ATM-Interworking policy workflow.

Table 3-13 ATM Interface Attributes

Description	Attribute
Transport Mode	<p>Choose the transport mode from the drop-down list. The choices are:</p> <ul style="list-style-type: none"> VP—Virtual path mode. This is the default. VC—Virtual circuit mode.
ATM Encapsulation	Choose the ATM encapsulation from the drop-down list. The only available option is AAL5SNAP.

EVC Attributes Window

Table 3-14 describes the attributes in the EVC Attributes Window of the EVC ATM-Interworking policy workflow. EVC attributes are organized under the following categories:

- Service Attributes**
- VLAN Match Criteria.** Prior to the introduction of the EVC capability, service providers could either deploy service-multiplexed services (ERS/ERMS or EVPL/EVCS) or service-bundled services on a single port. Both could not be supported simultaneously due to the limitations in the infrastructure, which only allowed matching the outer-most VLAN tag.

One of the key benefits of EVC support in Prime Provisioning is to provide a flexible means to examine the VLAN tags (up to two levels) of the incoming frames and associate them to appropriate Ethernet Flow Points (EFPs). This allows service providers to deploy simultaneously both the service-multiplexed and service-bundled services on a single port.

- **VLAN Rewrite Criteria.** Together with VLAN matching criteria, VLAN rewrite makes the EVC infrastructure very powerful and flexible. The following VLAN rewrite options are supported:
 - Pop one or two tags.
 - Push one or two tags.
 - Translation (1:1, 2:1, 1:2, 2:2).

Be aware of the following considerations when setting the VLAN rewrite criteria attributes:

- Only one kind of rewrite can be done on every CE-facing EVC link.
- All VLAN rewrites are done using the **symmetric** keyword on the ingress traffic (for example, **rewrite ingress tag pop 2 symmetric**).
- For any service instance, only one type of rewrite option (pop, push, or translate) is allowed per instance. For example, if pop out is enabled, push inner, push outer, translate inner, and translate outer are not available.

Table 3-14 EVC Attributes

Description	Attribute
Service Attributes	
AutoPick Service Instance ID	<p>Check the box to specify that the service instance ID will be autogenerated and allocated to the link during service request creation. If the check box is unchecked, while setting the Prime Provisioning link attributes during service request creation, Prime Provisioning will prompt the operator to specify the service instance ID. Usage notes:</p> <ul style="list-style-type: none"> • The service instance ID represents an Ethernet Flow Point (EFP) on an interface in the EVC infrastructure. The service instance ID is locally significant to the interface. This ID has to be unique only at the interface level. The ID must be a value from 1 to 8000. • There are no resource pools available in Prime Provisioning from which to allocate the service instance IDs. • It is the responsibility of the operator creating the service request to maintain the uniqueness of the ID at the interface level.
AutoPick Service Instance Name	<p>Check the box to have Prime Provisioning autogenerated a service instance name when you create a service request based on the policy. The autogenerated value is in the following pattern: <i>CustomerName_ServiceRequestJobID</i>. If the check box is unchecked, then you can enter a value during service request creation.</p>
Enable PseudoWire Redundancy	<p>Check the box to enable pseudowire redundancy (alternative termination device) under certain conditions. Enable Pseudo Wire Redundancy is only available if the MPLS Core Connectivity Type was set as PSEUDOWIRE in the Service Options window (see Service Options Window, page 3-90).</p>
AutoPick VC ID	<p>Check the box to have Prime Provisioning autopick the VC ID during service request creation. If this check box is unchecked, the operator will be prompted to specify a VC ID during service request creation. When AutoPick VC ID is checked, Prime Provisioning allocates a VC ID for pseudowires from the Prime Provisioning-managed VC ID resource pool.</p>

Table 3-14 EVC Attributes (continued)

Description	Attribute
AutoPick Bridge Domain/VLAN ID	<p>Check the box to have Prime Provisioning autopick the VLAN ID for the service request during service request creation. If this check box is unchecked, the operator will be prompted to specify a VLAN ID during service request creation. Usage notes:</p> <ul style="list-style-type: none"> • AutoPick Bridge Domain/VLAN ID consumes a global VLAN ID on the device. • The bridge domain/VLAN ID is picked from the existing Prime Provisioning VLAN pool. Once the VLAN ID is assigned in the service request, Prime Provisioning makes the VLAN ID unavailable for subsequent service requests. • In the case of manual VLAN ID allocation, Prime Provisioning does not manage the VLAN ID if the ID lies outside the range of an Prime Provisioning-managed VLAN pool. In this case, the operator must ensure the uniqueness of the ID in the Ethernet access domain. If an operator specifies a VLAN ID that is within the range of an Prime Provisioning-managed VLAN pool and the VLAN ID is already in use in the access domain, Prime Provisioning displays an error message indicating that the VLAN ID is in use. <p>For additional information on Access VLAN IDs, see Note on Access VLAN IDs, page 3-98.</p>
VLAN Matching Criteria Attributes	
Match Inner and Outer Tags	<p>Check the box to enable service requests created with the policy to match both the inner and outer VLAN tags of the incoming frames. If you do not check this check box, service requests created with the policy will match only the outer VLAN tag of the incoming frames. Checking the Match Inner and Outer Tags attribute causes the Inner VLAN Ranges attribute to appear in the EVC Attribute window.</p>
Inner VLAN Ranges	<p>Check the box to enable the range of inner VLAN tags to be specified during service request creation. If the check box is unchecked, the range of inner VLAN tags are not allowed. In this case, the operator must specify discrete VLAN IDs during service request creation.</p>
Outer VLAN Ranges	<p>Check the box to enable the range of outer VLAN tags to be specified during service request creation. If the check box is unchecked, the range of outer VLAN tags are not allowed. In this case, the operator must specify discrete VLAN IDs during service request creation.</p>
AutoPick Outer VLAN	<p>Check the box to have Prime Provisioning autopick the outer VLAN ID from a previously created outer VLAN ID resource pool during service request creation. If this check box is unchecked, the operator will be prompted to specify an outer VLAN ID during service request creation. Usage notes:</p> <ul style="list-style-type: none"> • Use of the AutoPick Outer VLAN attribute requires that two elements have already been set up in Prime Provisioning. One is an Interface Access Domain, which is a logical element that groups the physical ports of an N-PE device. The other is an EVC Outer VLAN resource pool, which is used by the Interface Access Domain. For instructions on how to set up these elements, see the sections Setting Up Resources, page 2-39, and Resource Pools, page 2-43. • AutoPick Outer VLAN can be used for interfaces that support EVC functionality. • AutoPick Outer VLAN consumes a VLAN ID on the interface that supports EVC. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool.

Table 3-14 EVC Attributes (continued)

Description	Attribute
AutoPick Inner VLAN	<p>Check the box to have Prime Provisioning autopick the Inner VLAN ID from a previously created Inner VLAN ID resource pool during service request creation. If this check box is unchecked, the operator will be prompted to specify an Inner VLAN ID during service request creation. Usage notes:</p> <ul style="list-style-type: none"> • Use of the AutoPick Inner VLAN attribute requires that two elements have already been set up in Prime Provisioning. One is an Interface Access Domain, which is a logical element that groups the physical ports of an N-PE device. The other is an EVC Inner VLAN resource pool, which is used by the Interface Access Domain. For instructions on how to set up these elements, see the sections Setting Up Resources, page 2-39, and Resource Pools, page 2-43. • AutoPick Inner VLAN can be used for interfaces that support EVC functionality. • AutoPick Inner VLAN consumes a VLAN ID on the interface that supports EVC. <p>The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool.</p> <p> Note The Match Inner and Outer Tags check box should be enabled in the policy to make use of AutoPick Inner VLAN feature during service request creation.</p>
VLAN Rewrite Criteria Attributes	
Pop Outer	Check the box to pop the outer VLAN ID tag of the incoming frames that fulfill the match criteria. If this check box is unchecked, the outer tag of the incoming traffic is not popped.
Pop Inner	Check the box to pop the inner VLAN ID tag of the incoming frames that fulfill the match-criteria. If this check box is unchecked, the inner tag is not popped. Note that, if Pop Inner is checked, Pop Outer is automatically checked.
Push Outer	<p>Check the box to impose an outer VLAN ID tag onto the incoming frames that fulfill the match criteria. If this check box is unchecked, no outer tag is imposed on the incoming frames. Usage notes:</p> <ul style="list-style-type: none"> • If Push Outer is checked, all service requests created with the policy push a dot1q outer tag on the incoming frames matching the match criteria. When creating the link during service creation, the operator can specify an outer tag with a value from 1 to 4096. • This attribute is available regardless of the number of tags used in the match criteria. Whether the incoming traffic is double tagged or single tagged, if Push Outer is enabled, all corresponding service requests push an outer tag. All subsequent nodes consider only the outer-most two tags (if EVC-capable) or just one tag (not EVC-capable) and treat the inner-most tags transparently as payload. • This VLAN ID is not derived from Prime Provisioning-managed VLAN ID pools.

Table 3-14 EVC Attributes (continued)

Description	Attribute
Push Inner	<p>Check the box to impose an inner VLAN ID tag onto the incoming frames that fulfill the match criteria. This operation pushes both an inner and an outer tag onto the incoming packet, not just an inner tag. If this check box is unchecked, no inner tag is imposed on the incoming frames. Usage notes:</p> <ul style="list-style-type: none"> • If Push Inner is checked, all service requests created with the policy push a dot1q inner tag on the incoming frames matching the match criteria. When creating the link during service creation, the operator can specify an inner tag with a value from 1 to 4096. • If Push Inner is checked, Push Outer is automatically checked. • This attribute is available regardless of the number of tags used in the match criteria. Regardless of whether the incoming traffic is double tagged or single tagged, if Push Inner is enabled, all corresponding service requests push an inner tag. All subsequent nodes consider only the outer-most two tags (if EVC-capable) or just one tag (not EVC-capable) and treat the inner-most tags transparently as payload. • This VLAN ID is not derived from Prime Provisioning-managed VLAN ID pools.
Translate Outer	<p>Check the box to allow the operator to specify a target outer VLAN ID during service request creation. The outer tag of all the incoming frames that fulfill the match criteria are translated to this ID. If the check box is unchecked, no outer tag translation is performed. See Table 3-15.</p>
Translate Inner	<p>Check the box to allow the operator to specify a target inner VLAN ID during service request creation. The inner tag of all the incoming frames that fulfill the match criteria are translated to this ID. If the check box is unchecked, no inner tag translation is performed. See Table 3-15.</p>

Note on Access VLAN IDs

An access VLAN ID is of local significance to the EVC-capable ports. It should not be confused with the global VLANs. This can be visualized as a partitioning of the Ethernet access network beyond the EVC ports into several subEthernet access domains (one each for an EVC-capable port).

However, all the service interfaces on the Ethernet access nodes beyond the EVC ports will have this very same VLAN ID for a link. This ID must be manually specified by the operator when setting the link attributes during service request creation. The operator must ensure the uniqueness of the ID across the EVC-demarcated Ethernet access domain.

These VLAN IDs are not managed by Prime Provisioning by means of locally-significant VLAN pools. But once a VLAN ID is assigned for a link in the service request, Prime Provisioning makes the VLAN unavailable for subsequent service requests within the Ethernet access domain demarcated by the EVC. Likewise, if a manually-specified VLAN is already in use in the access domain delimited by the EVC, Prime Provisioning will display an error message indicating that the new VLAN ID being specified is already in use on the NPC. The operator will be prompted to specify a different VLAN ID, which will be provisioned on the L2 access nodes.

Table 3-15 VLAN Translation Summary Table

Type	Match Outer Tag	Match Inner Tag	Translate Outer Tag	Translate Inner Tag	Push Outer Tag
1:1	True	N/A	Yes	No	N/A
1:2	True	N/A	N/A	N/A	Yes

Table 3-15 VLAN Translation Summary Table

Type	Match Outer Tag	Match Inner Tag	Translate Outer Tag	Translate Inner Tag	Push Outer Tag
2:1	True	True	Yes	No	N/A
2:2	True	True	Yes	Yes	N/A



Note

Table 3-15 summarizes the realization of different VLAN translations available in the EVC infrastructure. The second and third columns (Match Outer Tag and Match Inner Tag) refer to policy settings. The last two columns (Translate Outer Tag and Translate Inner Tag) indicate the VLAN translation that occurs on the incoming frames.

Interface Attributes Window

Table 3-16 describes the attributes in the Interface Attributes Window of the EVC ATM-Interworking policy workflow. The attributes you can configure in this window are grouped under the following categories:

- UNI Information
- VLAN
- Pseudowire
- ACL
- Security
- UNI Storm Control
- Protocol

In some cases, checking an attribute causes additional attributes to appear in the GUI. This is covered in the steps that follow.



Note

If the CE is directly connected to an N-PE, only speed, duplex, UNI shutdown, and other generic options are presented. In this case, port security, storm control, L2 protocol tunneling, and other advanced features are not supported due to the current platform limitations. If these features are needed for a service, the service provider must deploy Layer 2 Ethernet access nodes beyond the EVC to support these requirements.



Note

Attributes available in the Interface Attributes window dynamically change based on the choice made for the MPLS Core Connectivity Type (PSEUDOWIRE or LOCAL) in the Service Options window (see [Defining the EVC ATM-Ethernet Interworking Policy, page 3-33](#)). For completeness, all attributes available for the different core types are documented in the following steps. Attributes apply to all core types, unless otherwise noted.

Table 3-16 Interface Attributes

Attribute	Description
Standard UNI Port	<p>Check the box to enable port security. This is the default. When you uncheck the check box, the port is treated as an uplink with no security features, and the window dynamically changes to eliminate items related to port security.</p> <p>When the UNI is configured on an N-PE device running IOS XR, the Standard UNI Port attribute is not supported. All the CLIs related to Standard UNI Port and UNI Port Security are ignored in this case.</p>
UNI Shutdown	Check the box if you want to leave the UNI port shut during service activation, for example, when the service provider wants to deploy a service in the network but wants to activate it at a later time.
Keep Alive	Check the box to configure keepalives on the UNI port. By default, this check box is unchecked, which causes the command no keepalive to be provisioned on the UNI port. This prevents a CPE from sending keepalive packets to the U-PE, for security purposes. This attribute is editable, in order to support modification on a per-service request basis.
Link Media (optional)	Enter None, auto-select, rj45, or sfp.
Link Speed (optional)	Enter None, 10, 100, 1000, Auto, or nonegotiate.
Link Duplex (optional)	Enter None, Full, Half, or Auto.
Encapsulation	<p>Choose a type. The choices are:</p> <ul style="list-style-type: none"> • DOT1QTRUNK—Configures the UNI as a trunk with 802.1q encapsulation. If the UNI belongs to a directly connected and EVC link, this setting signifies that the incoming frames are 802.1q encapsulated and that they match the VLAN ID configured for the link. This specific topology does not involve a trunk UNI as such. • DOT1QTUNNEL—Configures the UNI as an 802.1q tunnel (also known as a dot1q tunnel or Q-in-Q) port. • ACCESS—Configures the UNI as an access port.
VLAN Translation	<p>Specify the type for this policy by clicking the appropriate radio button. The choices are:</p> <ul style="list-style-type: none"> • No—No VLAN translation is performed. (This is the default.) • 1:1—1:1 VLAN translation. Translates an incoming customer VLAN to another. • 2:1—2:1 VLAN translation. Converts both inner and outer VLANs to a single VLAN. • 1:2—1:2 VLAN translation. Pushes one more provider VLAN. • 2:2—2:2 VLAN translation. Translates both inner and outer VLANs to two other VLANs. <p>For more details on how VLAN translation is supported in EVC ATM-Ethernet services, see the coverage of the VLAN Translation attribute in Managing an EVC ATM-Ethernet Interworking Service Request, page 3-34.</p>

Table 3-16 Interface Attributes (continued)

Attribute	Description
Use PseudoWireClass	<p>Check the box to enable the selection of a pseudowire class. This attribute is unchecked by default.</p> <p>Usage notes:</p> <ul style="list-style-type: none"> The pseudowire class name is used for provisioning pw-class commands on IOS and IOS XR devices. See Creating and Modifying Pseudowire Classes, page 3-15 for additional information on pseudowire class support. If Use PseudoWireClass is checked, an additional attribute, PseudoWireClass, appears in the GUI. Click the Select button of PseudoWireClass attribute to choose a pseudowire class previously created in Prime Provisioning. The Use PseudoWireClass attribute is only available if the MPLS core connectivity type was set as PSEUDOWIRE in the Service Options window (see Defining the EVC ATM-Ethernet Interworking Policy, page 3-33).
L2VPN Group Name	<p>Choose one of the following from the drop-down list:</p> <ul style="list-style-type: none"> ISC VPNSC <p>Usage notes:</p> <ul style="list-style-type: none"> This attribute is used for provisioning the L2VPN group name on IOS XR devices. The choices in the drop-down list are derived from a configurable DCPL property. For information about how to define the L2VPN Group Name choices available in the drop-down list, see Defining L2VPN Group Names for IOS XR Devices, page 3-19. L2VPN Group Name is only applicable for IOS XR devices.
E-Line Name	<p>Specify the point-to-point (p2p) E-line name. Usage notes:</p> <ul style="list-style-type: none"> If no value is specified for the E-Line Name in either the policy or the service request based on the policy, Prime Provisioning autogenerates a default name as follows: <ul style="list-style-type: none"> For PSEUDOWIRE core connectivity type, the format is: <i>DeviceName--VC_ID</i> For LOCAL core connectivity type, the format is: <i>DeviceName--VLAN_ID</i> <p>If the default name is more than 32 characters, the device names are truncated.</p> E-Line Name is only applicable for IOS XR devices.

Table 3-16 Interface Attributes (continued)

Attribute	Description
N-PE Pseudo-wire on SVI	<p>Check the box to have Prime Provisioning generate forwarding commands under SVIs (switch virtual interfaces). By default, this check box is not checked. In this case, Prime Provisioning generates forwarding commands under the service instance.</p> <p>For an EVC link, the attribute N-PE Pseudo-wire on SVI is dependent on the value of the attribute Configure with Bridge Domain (this is available in the policy workflow in the EVC Policy Editor - Service Options window). N-PE Pseudo-wire on SVI, if enabled, will be reflected only when Configure with Bridge Domain is set to true. Otherwise, the service request will not be created with xconnect under SVI, even if N-PE Pseudo-wire on SVI is enabled.</p> <p>Usage notes:</p> <ul style="list-style-type: none"> • Prime Provisioning supports a hybrid configuration for EVC service requests. In a hybrid configuration, the forwarding commands (such as xconnect) for one side of an attachment circuit can be configured under a service instance, and the xconnect configuration for the other side of the attachment circuit can be configured under a switch virtual interface (SVI). • For examples of these cases, see configlet examples EVC (Pseudowire Core Connectivity, Bridge Domain, Pseudowire on SVI), page 3-164 and EVC (Pseudowire Core Connectivity, no Bridge Domain, no Pseudowire on SVI), page 3-165. • N-PE Pseudo-wire on SVI is applicable for all connectivity types, but a hybrid SVI configuration is possible only for pseudowire connectivity. • When MPLS Core Connectivity Type is set as LOCAL connectivity type, the N-PE Pseudo-wire on SVI attribute is always disabled in the policy and service request. • The N-PE Pseudo-wire on SVI attribute is not supported for IOS XR devices. All the xconnect commands are configured on L2 subinterfaces/service instance. • Table 3-17 shows various use cases for hybrid configuration for EVC service requests. [Move outside table]
Use Existing ACL Name	<p>Check the box if you want to assign your own named access list to the port. By default, this check box is not checked and Prime Provisioning automatically assigns a MAC-based ACL on the customer facing UNI port, based on values you enter in UNI MAC addresses.</p>
Port-Based ACL Name	<p>Enter a Port-Based ACL Name (if you checked the Use Existing ACL Name check box).</p> <p>Prime Provisioning does not create this ACL automatically. The ACL must already exist on the device, or be added as part of a template, before the service request is deployed. Otherwise, deployment will fail.</p>
UNI MAC addresses	<p>Enter one or more Ethernet MAC addresses. This selection is present only if you uncheck the Use Existing ACL Name check box. Click the Edit button to bring up a pop-up window in which you enter MAC addresses to be allowed or denied on the port. You can also specify a range of addresses by setting a base MAC address and a filtered MAC address.</p>

Table 3-16 Interface Attributes (continued)

Attribute	Description
UNI Port Security	<p>Check the box if you want to provision port security-related CLIs to the UNI port by controlling the MAC addresses that are allowed to go through the interface.</p> <ul style="list-style-type: none"> • For Maximum Number of MAC address, enter the number of MAC addresses allowed for port security. • For Aging, enter the length of time the MAC address can stay on the port security table. • For Violation Action, choose what action will occur when a port security violation is detected: <ul style="list-style-type: none"> – PROTECT—Drops packets with unknown source addresses until a sufficient number of secure MAC addresses are removed to drop below the maximum value. – RESTRICT—Drops packets with unknown source addresses until a sufficient number of secure MAC addresses are removed to drop below the maximum value and causes the Security Violation counter to increment. – SHUTDOWN—Puts the interface into the error-disabled state immediately and sends an SNMP trap notification. • In the Secure MAC Addresses field, enter one or more Ethernet MAC addresses.
Enable Storm Control	<p>Check the box to help prevent the UNI port from being disrupted by a broadcast, multicast, or unicast storm. Enter a threshold value for each type of traffic. The value, which can be specified to two significant digits, represents the percentage of the total available bandwidth of the port. If the threshold of a traffic type is reached, further traffic of that type is suppressed until the incoming traffic falls below the threshold level.</p>
Protocol Tunnelling	<p>Check the box if you want to define the Layer 2 Bridge Protocol Data Unit (BPDU) frames that can be tunneled over the core to the other end. For each protocol that you choose, enter the shutdown threshold and drop threshold for that protocol:</p> <ul style="list-style-type: none"> • Enable cdp—Enable Layer 2 tunnelling on Cisco Discover Protocol (CDP). • cdp shutdown threshold—Enter the number of packets per second to be received before the interface is shut down. • cdp drop threshold—Enter the number of packets per second to be received at which point the interface will start dropping CDP packets. • Enable vtp—Enable Layer 2 tunnelling on VLAN Trunk Protocol (VTP). • vtp shutdown threshold—Enter the number of packets per second to be received before the interface is shut down. • vtp drop threshold—Enter the number of packets per second to be received at which point the interface will start dropping VTP packets. • Enable stp—Enable Layer 2 tunnelling on Spanning Tree Protocol (STP). • stp shutdown threshold—Enter the number of packets per second to be received before the interface is shut down. • stp drop threshold—Enter the number of packets per second to be received at which point the interface will start dropping STP packets. • Recovery Interval—Enter the amount of time, in seconds, to wait before recovering a UNI port.

Table 3-16 Interface Attributes (continued)

Attribute	Description
MTU Size	<p>Enter the MTU size in bytes. The maximum transmission unit (MTU) size is configurable and optional. The default size is 9216, and the range is 1500 to 9216. Prime Provisioning does not perform an integrity check for this customized value. If a service request goes to the Failed Deploy state because this size is not accepted, you must adjust the size until the Service Request is deployed.</p> <p>In Cisco Prime Provisioning 6.3, different platforms support different ranges.</p> <ul style="list-style-type: none"> For the 3750 and 3550 platforms, the MTU range is 1500 to 1546. For the Cisco 7600 Ethernet port, the MTU size is always 9216. Even with the same platform and same IOS release, different line cards support the MTU differently. For example, older line cards only take an MTU size of 9216 and newer cards support 1500 to 9216. However, Cisco Prime Provisioning 6.3 uses 9216 in both cases. For the Cisco 7600 SVI (interface VLAN), the MTU size is 1500 to 9216.

Table 3-17 Use Cases for Hybrid Configuration for EVC Service Requests

Use Bridge Domain	EVC	N-PE Pseudowire on SVI	CLIs Generated
True	True	True	<ul style="list-style-type: none"> xconnect under VLAN interface. Service instance under main interface.
True	True	False	<ul style="list-style-type: none"> xconnect under service instance. Service instance under main interface.
False	True	N/A	<ul style="list-style-type: none"> xconnect under service instance. Service instance under main interface.
True	False	True	xconnect under VLAN interface.
True	False	False	xconnect under subinterface.
False	False	False	xconnect under subinterface.

EVC ATM-Ethernet Interworking Service Request Attributes

This section describes attributes available in the EVC ATM-Ethernet Interworking service request workflow:

- [Table 3-18, “Pseudowire Core Connectivity Attributes,” on page 105](#)
- [Table 3-19, “Local Core Connectivity Attributes,” on page 107](#)
- [Table 3-20, “Service Instance Details Attributes,” on page 109](#)
- [Table 3-21, “Standard UNI Attributes,” on page 113](#)
- [Table 3-22, “ATM UNI Attributes,” on page 117](#)

Table 3-18 Pseudowire Core Connectivity Attributes

Attribute	Description
Job ID, SR ID	These fields are read-only. When the service request is being created for the first time, the fields display a value of NEW. When an existing service request is being modified, the values of the fields indicate the respective IDs that the Prime Provisioning database holds within the editing flow of the service request.
Policy	This field is read-only. It displays the name of the policy on which the service request is based. Clicking on the read-only policy name displays a list of all the attribute values set within the policy.
Select VPN	<p>Click to choose a VPN for use with this service request. The Select VPN window appears with the VPNs defined in the system.</p> <p>The same VPN can be used by service requests with LOCAL and PSEUDOWIRE core types. If a VPN for a service request is used with VPLS core type, the same VPN cannot be used for service requests with LOCAL or PSEUDOWIRE core type.</p> <ol style="list-style-type: none"> Choose a VPN Name in the Select column. You may also use the New VPN Details section of the window to create a new VPN “on the fly.” This window provides a subset of the usual VPN creation features. Use the supplied fields to name the new VPN, select/create the customer, and so on. For more information about creating VPNs, see Setting Up Logical Inventory, page 2-53. Click Select. <p>The EVC Service Request Editor window appears with the VPN name displayed.</p>
AutoPick VC ID	Check the box if you want Prime Provisioning to choose a VC ID. If you do not check this check box, you will be prompted to provide the ID in the VC ID field, as covered in the next step. When AutoPick VC ID is checked, Prime Provisioning allocates a VC ID for pseudowires from the Prime Provisioning-managed VC ID resource pool. In this case, the text field for the VC ID option is non-editable.
VC ID	<p>If AutoPick VC ID was unchecked, enter a VC ID in the VC ID field. Usage notes:</p> <ul style="list-style-type: none"> The AutoPick VC ID attribute appears during the creation of an EVC pseudowire service request. The VC ID value must be an integer value corresponding to a VC ID. When a VC ID is manually allocated, Prime Provisioning verifies the VC ID to see if it lies within Prime Provisioning’s VC ID pool. If the VC ID is in the pool but not allocated, the VC ID is allocated to the service request. If the VC ID is in the pool and is already in use, Prime Provisioning prompts you to allocate a different VC ID. If the VC ID lies outside of the Prime Provisioning VC ID pool, Prime Provisioning does not perform any verification about whether or not the VC ID allocated. The operator must ensure the VC ID is available. The VC ID can be entered only while creating a service. If you are editing the service request, the VC ID field is not editable.

Table 3-18 Pseudowire Core Connectivity Attributes (continued)

Attribute	Description
Enable PseudoWire Redundancy	<p>Check the box to enable pseudowire redundancy (alternative termination device) under certain conditions. Usage notes:</p> <ul style="list-style-type: none"> • Enable Pseudo Wire Redundancy is only available if the MPLS Core Connectivity Type was set as PSEUDOWIRE in the Service Options window (see Defining the EVC ATM-Ethernet Interworking Policy, page 3-33). • Enabling this feature allows the user to do the following: <ul style="list-style-type: none"> – Configure two pseudowires between two direct links, or: – Add a backup peer such that pseudowires are configured between A–Z and A–Z'. In this case, the terminating links A, Z, and Z' must all be directly connected links. L2 access links are not supported as backup peers. • See Setting Up Pseudowire Redundancy and a Backup Peers, page 3-28, for more information on using this feature in service requests.
Backup PW VC ID	<p>If the AutoPick VC ID attribute was unchecked, enter a VC ID for the backup pseudowire in the Backup PW VC ID field. See the usage notes for the AutoPick VC ID attribute above. The backup VC ID behaves the same as the VC ID of the primary pseudowire.</p>
Static Pseudowire (Autopick MPLS Labels)	<p>Choose a type. The choices are:</p> <ul style="list-style-type: none"> • All Dynamic—Labels will be allocated dynamically during provisioning. No static labels will be added into the configlet. • All Static—Labels will be allocated statically during provisioning. Every segment in a multi-segment pseudowire will have static labels assigned to it on per-segment basis. • Defaults—Prime Provisioning will automatically determine whether or not to apply static labels based on the core type of the segment. It will do this on a per segment basis. <p>This attribute only supported for MPLS Core Connectivity Types of PSEUDOWIRE or VPLS.</p>
Configure Bridge Domain	<p>Check the box to determine bridge domain characteristics. The behavior of the Configure Bridge Domain option works in tandem with the choice you selected in the MPLS Core Connectivity Type option in the EVC policy, which in this case is pseudowire core connectivity. There are two cases:</p> <ul style="list-style-type: none"> • With EVC: <ul style="list-style-type: none"> – If Configure With Bridge Domain is checked, the policy will configure pseudowires under SVIs associated to the bridge domain. – If Configure With Bridge Domain is unchecked, the policy will configure pseudowires directly under the service instance. This will conserve the global VLAN. • Without EVC: <ul style="list-style-type: none"> – If Configure With Bridge Domain is checked, the policy will configure pseudowires under SVIs. – If Configure With Bridge Domain is unchecked, the policy will configure pseudowires directly under subinterfaces. <p>Pseudowires can be configured either directly under service instance of the corresponding EVC-capable interface or under SVIs associated to the bridge domain.</p>

Table 3-18 Pseudowire Core Connectivity Attributes (continued)

Attribute	Description
Use Split Horizon	<p>Check the box to enable split horizon with bridge domain. Usage notes:</p> <ul style="list-style-type: none"> The Use Split Horizon attribute is disabled by default. The Use Split Horizon attribute can be used only when the Configure Bridge Domain check box is checked (enabled). When Use Split Horizon is enabled, the bridge domain command in the CLI will be generated with split horizon. When it is disabled, the bridge domain command will be generated without split horizon.
Description	Click the “Click here” link to enter a description label for the service request. This is useful for searching the Prime Provisioning database for the particular service request.

Table 3-19 Local Core Connectivity Attributes

Attribute	Description
Job ID, SR ID	These fields are read-only. When the service request is being created for the first time, the fields display a value of NEW. When an existing service request is being modified, the values of the fields indicate the respective IDs that the Prime Provisioning database holds within the editing flow of the service request.
Policy	This field is read-only. It displays the name of the policy on which the service request is based.
Select VPN	<p>Click to choose a VPN for use with this service request. The Select VPN window appears with the VPNs defined in the system.</p> <p>The same VPN can be used by service requests with LOCAL and PSEUDOWIRE core types. If a VPN for a service request is used with VPLS core type, the same VPN cannot be used for service requests with LOCAL or PSEUDOWIRE core type.</p> <ol style="list-style-type: none"> Choose a VPN Name in the Select column. You may also use the New VPN Details section of the window to create a new VPN “on the fly.” This window provides a subset of the usual VPN creation features. Use the supplied fields to name the new VPN, select/create the customer, and so on. For more information about creating VPNs, see Setting Up Logical Inventory, page 2-53. Click Select. <p>The EVC Service Request Editor window appears with the VPN name displayed.</p>

Table 3-19 Local Core Connectivity Attributes (continued)

Attribute	Description
Configure Bridge Domain	<p>Check the box to determine bridge domain characteristics. Usage notes:</p> <ul style="list-style-type: none"> If Configure Bridge Domain is checked, all links will have the same bridge domain ID allocated from the VLAN pool on the N-PE. All non-EVC links will have the Service Provider VLAN as the bridge domain ID. On the other hand, if no EVC links are added, the Service Provider VLAN will be allocated first and this will be used as the bridge domain ID when EVC links are added. If Configure Bridge Domain is unchecked, a maximum of two links that terminate on the same N-PE can be added. (This uses the connect command available in the EVC infrastructure.) This is only supported for ATM-ATM local connect. See the following comments for details on how Prime Provisioning autogenerates the connect name. <p>Because the device only accepts a maximum of 15 characters for the connect name, the connect name is generated using the following format:</p> <p style="text-align: center;"><i>CustomerNameTruncatedToMaxPossibleCharacters_ServiceRequestJobID</i></p> <p>For example, if the customer name is NorthAmericanCustomer and the service request job ID is 56345, the autogenerated connect name would be NorthAmer_56345.</p> <p>The CLI generated would be:</p> <pre style="text-align: center;">connect NorthAmer_56345 ATM7/0/5 11 ATM7/0/4 18</pre> <p>In this case, 11 and 18 are service instance VPIs.</p> <ul style="list-style-type: none"> If the policy setting for Configure Bridge Domain is non-editable, the option in the service request will be read-only.
Use Split Horizon	<p>Check the box to enable split horizon with bridge domain. Usage notes:</p> <ul style="list-style-type: none"> The Use Split Horizon attribute is disabled by default. The Use Split Horizon attribute can be used only when the Configure Bridge Domain check box is checked (enabled). When Use Split Horizon is enabled, the bridge domain command in the CLI will be generated with split horizon. When it is disabled, the bridge domain command will be generated without split horizon.
Description	Click the “Click here” link to enter a description label for the service request. A dialogue appears in which you can enter a description.

Table 3-20 Service Instance Details Attributes

Attribute	Description
AutoPick Service Instance ID	<p>Check the box to specify that the service instance ID will be autogenerated and allocated to the link during service request creation. If the check box is unchecked, you must specify the service instance ID. Usage notes:</p> <ul style="list-style-type: none"> The service instance ID represents an Ethernet Flow Point (EFP) on an interface in the EVC infrastructure. The service instance ID is locally significant to the interface. This ID has to be unique only at the interface level. The ID must be a value from 1 to 8000. There are no resource pools available in Prime Provisioning from which to allocate the service instance IDs. In the case of a manually provided service instance ID, it is the responsibility of the operator to maintain the uniqueness of the ID at the interface level. This attribute is not displayed for IOS XR devices.
Service Instance ID	<p>If the AutoPick Service Instance ID check box is not checked, enter an appropriate value for the service instance ID in the Service Instance ID field.</p>
AutoPick Service Instance Name	<p>Check the box to specify that the service instance name will be autogenerated. If the check box is unchecked, you can specify the service instance name. Usage notes:</p> <ul style="list-style-type: none"> If the check box is checked, the Service Instance Name text field is disabled. The service instance name is autogenerated in the following pattern: <i>CustomerName_ServiceRequestJobID</i>. For example configlets, see EVC (No AutoPick Service Instance Name, No Service Instance Name), page 3-167, EVC (Pseudowire Core Connectivity, User-Provided Service Instance Name), page 3-168, and EVC (Local Core Connectivity, User-Provided Service Instance Name), page 3-181. This attribute is not displayed for IOS XR devices.
Service Instance Name	<p>If the AutoPick Service Instance Name check box is not checked, enter an appropriate value for the service instance ID in the Service Instance Name field. Usage notes:</p> <ul style="list-style-type: none"> The text string representing the service instance name must be 40 characters or less and contain no spaces. Other special characters are allowed. If AutoPick Service Instance Name is unchecked and no service instance name is entered in the text field, then Prime Provisioning does not generate the global ethernet evc evcname command in the device configuration generated by the service request.
AutoPick Bridge Domain/VLAN ID	<p>Check the box to have Prime Provisioning autopick the VLAN ID for the service request during service request creation. If this check box is unchecked, the you must specify a bridge domain VLAN ID. Usage notes:</p> <ul style="list-style-type: none"> AutoPick Bridge Domain/VLAN ID consumes a global VLAN ID on the device. The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool. This attribute is not displayed for IOS XR devices.

Table 3-20 Service Instance Details Attributes (continued)

Attribute	Description
Bridge Domain/VLAN ID	<p>If the AutoPick Bridge Domain/VLAN ID check box is unchecked, enter an appropriate value in the Bridge Domain/VLAN ID field.</p> <p>This configuration applies in conjunction with the Configure Bridge Domain option in the EVC Service Request Editor window. If the option is not enabled in that window, then AutoPick Bridge Domain/VLAN ID check box is redundant and not required.</p> <p>When a VLAN ID is manually allocated, Prime Provisioning verifies the VLAN ID to see if it lies within Prime Provisioning's VLAN ID pool. If the VLAN ID is in the pool but not allocated, the VLAN ID is allocated to the service request. If the VLAN ID is in the pool and is already in use, Prime Provisioning prompts you to allocate a different VLAN ID. If the VLAN ID lies outside of the Prime Provisioning VLAN ID pool, Prime Provisioning does not perform any verification about whether the VLAN ID allocated. The operator must ensure the VLAN ID is available.</p>
AutoPick Bridge Domain/VLAN ID Secondary N-PE	<p>Check the box to have Prime Provisioning autopick the bridge domain VLAN ID for the secondary N-PE of a dual-homed ring during service request creation. If this check box is unchecked, the you must specify a secondary bridge domain VLAN ID for the secondary N-PE. Usage notes:</p> <ul style="list-style-type: none"> • This attribute is only applicable in the case of a dual-homed ring (a ring that terminates on two different N-PEs). Prime Provisioning supports having a separate bridge domain VLAN ID for the secondary N-PE. • In a dual-homed ring, if the two N-PEs are in different access domains, Prime Provisioning allocates the bridge domain VLAN IDs from both primary and secondary N-PE access domains. When both are in the same Access Domain, Prime Provisioning allocates a common VLAN ID from the Access Domain to which these belong. • AutoPick Bridge Domain/VLAN ID Secondary N-PE consumes a global VLAN ID on the device. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool. • This attribute is not displayed for IOS XR devices.
Bridge Domain/VLAN ID Secondary N-PE	<p>If the AutoPick Bridge Domain/VLAN ID Secondary N-PE check box is unchecked, enter an appropriate value in the Bridge Domain/VLAN ID Secondary N-PE field.</p>
Match Inner and Outer Tags	<p>Check the box to enable service requests created with the policy to match both the inner and outer VLAN tags of the incoming frames. If you do not check this check box, service requests created with the policy will match only the outer VLAN tag of the incoming frames. Checking the Match Inner and Outer Tags attribute causes the Inner VLAN ID and Outer VLAN ID fields (covered in the next steps) to appear.</p>

Table 3-20 Service Instance Details Attributes (continued)

Attribute	Description
Match Inner and Outer Tags	<p>Check the box to enter the inner and outer VLAN tags in the Inner VLAN ID and Outer VLAN ID fields. Usage notes:</p> <ul style="list-style-type: none"> • You can specify single values, single ranges, multiples values, multiple ranges, or combinations of these. Examples: <ul style="list-style-type: none"> – 10 – 10, 15,17 – 10-15 – 10-15,17-20 – 10,20-25 • If the Inner VLAN Ranges attribute is set to true in the policy, the Inner VLAN ID field can take a range of inner VLAN tags. • If the Outer VLAN Ranges attribute is set to true in the policy, the Outer VLAN ID field can take a range of Outer VLAN tags.
Outer VLAN ID	<p>If the Match Inner and Outer Tags check box is unchecked, enter the outer VLAN tag in the Outer VLAN ID field.</p> <ul style="list-style-type: none"> • The VLAN specified in Outer VLAN ID will be provisioned on the rest of the L2 access nodes (if the link has any), including the customer-facing UNI. • You may also have Prime Provisioning autopick the outer VLAN ID.
Inner VLAN ID	<p>If the Match Inner and Outer Tags check box is checked, enter both the inner and the outer VLAN tags in the Inner VLAN ID and Outer VLAN ID fields. Usage notes:</p> <ul style="list-style-type: none"> • The VLAN specified in Inner VLAN ID will be provisioned on the rest of the L2 access nodes (if the link has any), including the customer-facing UNI. • You may also have Prime Provisioning autopick the inner VLAN ID using the AutoPick Inner VLAN attribute.
AutoPick Outer VLAN	<p>Check the box to have Prime Provisioning autopick the outer VLAN ID from a previously created outer VLAN ID resource pool. If this check box is unchecked, the operator will be prompted to specify an outer VLAN ID. Usage notes:</p> <ul style="list-style-type: none"> • Use of the AutoPick Outer VLAN attribute requires that two elements have already been set up in Prime Provisioning. One is an Interface Access Domain, which is a logical element that groups the physical ports of an N-PE device. The other is an EVC Outer VLAN resource pool, which is used by the Interface Access Domain. For instructions on how to set up these elements, see the sections Setting Up Resources, page 2-39, and Resource Pools, page 2-43. • AutoPick Outer VLAN can be used for interfaces that support EVC functionality • AutoPick Outer VLAN consumes a VLAN ID on the interface that supports EVC. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool.

Table 3-20 Service Instance Details Attributes (continued)

Attribute	Description
AutoPick Inner VLAN	<p>Check the box to have Prime Provisioning autopick the Inner VLAN ID from a previously created Inner VLAN ID resource pool during service request creation. If this check box is unchecked, the operator will be prompted to specify an Inner VLAN ID during service request creation. Usage notes:</p> <ul style="list-style-type: none"> • Use of the AutoPick Inner VLAN attribute requires that two elements have already been set up in Prime Provisioning. One is an Interface Access Domain, which is a logical element that groups the physical ports of an N-PE device. The other is an EVC Inner VLAN resource pool, which is used by the Interface Access Domain. For instructions on how to set up these elements, see the sections Setting Up Resources, page 2-39, and Resource Pools, page 2-43. • AutoPick Inner VLAN can be used for interfaces that support EVC functionality. • AutoPick Inner VLAN consumes a VLAN ID on the interface that supports EVC. <p>The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool.</p> <p> Note The Match Inner and Outer Tags check box should be enabled in the policy to make use of AutoPick Inner VLAN feature during service request creation.</p>
Rewrite Type	<p>Choose a type from the drop-down list. The choices are:</p> <ul style="list-style-type: none"> • Pop • Push • Translate <p>The subsequent attributes in the GUI change depending on the choice of Rewrite Type, as covered in the next steps.</p> <p>If Pop is the Rewrite Type, two check boxes appear:</p> <ol style="list-style-type: none"> a. Check the Pop Outer Tag check box to pop the outer VLAN ID tag of the incoming frames that fulfill the match criteria. If this check box is unchecked, the outer tag of the incoming traffic will not be popped. b. Check the Pop Inner Tag check box to pop the inner VLAN ID tag of the incoming frames that fulfill the match-criteria. If this check box is unchecked, the inner tag will not be changed. <p>Note that if Pop Inner Tag is checked, Pop Outer Tag is automatically checked.</p> <p>If Push is the Rewrite Type, two text boxes appear:</p> <ol style="list-style-type: none"> a. In the text box Outer VLAN ID, enter an outer VLAN ID tag that will be imposed on the incoming frames that fulfill the match criteria. All service requests created with this setting push a dot1q outer tag on the incoming frames matching the match criteria. If a value is not provided, the push operation is ignored and not configured on the device. b. In the text box Inner VLAN ID, enter an inner VLAN ID tag that will be imposed on the incoming frames that fulfill the match criteria. All service requests created with this setting push a dot1q inner tag on the incoming frames matching the match criteria. The Inner VLAN tag cannot be pushed without an Outer VLAN tag. That is, when pushing an Inner VLAN tag, the Outer VLAN tag also must be defined.

Table 3-20 Service Instance Details Attributes (continued)

Attribute	Description
	<p>If Translate is the Rewrite Type, a Translation Type drop-down list appears. The choices available in this list vary depending on the setting of the Match Inner and Outer Tags attribute (set in a previous step).</p> <ol style="list-style-type: none"> a. If the Match Inner and Outer Tags check box is checked (true), choose a translation type of 1:1, 1:2, 2:1, or 2:2 from the Translation Type drop-down list. <ul style="list-style-type: none"> – If you choose 1:1 or 2:1, enter a value in the Outer VLAN ID text box that appears. The outer tag of all the incoming frames that fulfill the match criteria will be translated to this ID. – If you choose 1:2 or 2:2, enter values in the Outer VLAN ID and Inner VLAN ID text boxes that appear. The outer and inner tags of all the incoming frames that fulfill the match criteria will be translated to these IDs. b. If the Match Inner and Outer Tags check box is unchecked (false), choose a translation type of 1:1 or 1:2 from the Translation Type drop-down list. <ul style="list-style-type: none"> – If you choose 1:1, enter a value in the Outer VLAN ID text box that appears. The outer tag of all the incoming frames that fulfill the match criteria will be translated to this ID. – If you choose 1:2, enter values in the Outer VLAN ID and Inner VLAN ID text boxes that appear. The outer and inner tags of all the incoming frames that fulfill the match criteria will be translated to these IDs.

Table 3-21 Standard UNI Attributes

Attribute	Description
N-PE/U-PE Information, Interface Name	These fields display the PE device and interface name selected in previous steps. These fields are read-only.
Encapsulation	<p>Choose a type from the drop-down list. The choices are:</p> <ul style="list-style-type: none"> • DOT1QTRUNK—Configures the UNI as a trunk with 802.1q encapsulation. If the UNI belongs to a directly connected and EVC link, this setting signifies that the incoming frames are 802.1q encapsulated and that they match the VLAN ID configured for the link. This specific topology does not involve a trunk UNI as such. • DOT1QTUNNEL—Configures the UNI as an 802.1q tunnel (also known as a dot1q tunnel or Q-in-Q) port. • ACCESS—Configures the UNI as an access port. <p>This attribute allows you to deploy different types of UNI encapsulation on different links of a service. In the case of direct connect links for which EVC is enabled (by checking the EVC check box in the EVC Service Request Editor window), the choices for the Encapsulation type are DOT1Q and DEFAULT.</p>
PE/UNI Interface Description	Enter a description for the interface, if desired.
UNI Shutdown	Check the box if you want to leave the UNI port shut during service activation (for example, when the service provider wants to deploy a service in the network but wants to activate it at a later time).

Table 3-21 Standard UNI Attributes (continued)

Attribute	Description
VLAN Translation	<p>Specify the type of VLAN Translation for the service request by clicking the appropriate radio button. The choices are:</p> <ul style="list-style-type: none"> • No—No VLAN translation is performed. (This is the default.) • 1:1—1:1 VLAN translation. • 2:1—2:1 VLAN translation. • 1:2—1:2 VLAN translation. • 2:2—2:2 VLAN translation.
	<p>Usage notes:</p> <ul style="list-style-type: none"> • The VLAN Translation attribute does not appear for direct connect links if the EVC check box is enabled. It does appear for the following combinations: <ul style="list-style-type: none"> – Direct connect links with EVC check box disabled. – L2 access nodes with EVC check box enabled or disabled. • Choosing a selection other than No causes other fields to appear in the GUI, which you can set based on your configuration: <ul style="list-style-type: none"> – CE VLAN—Provide a value between 1 and 4096. – Auto Pick—Check this check box to have Prime Provisioning autopick the outer VLAN from the VLAN resource pool. – Outer VLAN—If Auto Pick is unchecked, provide a value between 1 and 4096. – Select where 2:1 or 2:2 translation takes place—Specify the device where the 2:1 or 2:2 VLAN translation will take place. If you choose Auto, the VLAN translation takes place at the device closest to the UNI port. • VLAN translation, and all standard UNI and port security attributes are applicable for links with L2 access. If the UNI is on an N-PE, these attributes will not appear. • When the VLAN translation takes place on a U-PE or PE-AGG device, the VLAN translation command is configured on the NNI interface of the selected device. When the VLAN translation takes place on an NP-E, the VLAN translation command is configured on the UNI interface of the device. • When there are two NNI interfaces in a ring-based environment, VLAN translation is applied for both of these NNI interfaces. • 1:1 and 2:1 VLAN translations are supported with the same syntax as for non-EVC (switchport-based N-PE syntax) terminating attachment circuits.
N-PE Pseudo-wire on SVI	<p>Check the box to have Prime Provisioning generate forwarding commands under SVIs (switch virtual interfaces). By default, this check box is not checked. In this case, Prime Provisioning generates forwarding commands under the service instance.</p> <p>For an EVC link, the attribute N-PE Pseudo-wire on SVI is dependent on the value of the attribute Configure with Bridge Domain (this is available in the service request workflow in the EVC Service Request Editor window). N-PE Pseudo-wire on SVI, if enabled, will be reflected only when Configure with Bridge Domain is set to true. Otherwise, the service request will not be created with xconnect under SVI, even if N-PE Pseudo-wire on SVI is enabled.</p>

Table 3-21 Standard UNI Attributes (continued)

Attribute	Description
	<p>Usage notes:</p> <ul style="list-style-type: none"> For an EVC link, the attribute N-PE Pseudo-wire on SVI is dependent on the value of the attribute Configure with Bridge Domain (in the EVC Service Request Editor window). N-PE Pseudo-wire on SVI, if enabled, will be reflected only when Configure with Bridge Domain is set to true. Otherwise, the service request will not be created with scanned under SVI, even if N-PE pseudo-wire on SVI is enabled. Prime Provisioning supports a hybrid configuration for EVC service requests. In a hybrid configuration, the forwarding commands (such as scanned) for one side of an attachment circuit can be configured under a service instance, and the xconnect configuration for the other side of the attachment circuit can be configured under a switch virtual interface (SVI). N-PE Pseudo-wire on SVI is applicable for all connectivity types (PSEUDOWIRE or LOCAL), but a hybrid SVI configuration is possible only for pseudowire connectivity. When MPLS Core Connectivity Type is set as LOCAL connectivity type, the N-PE Pseudo-wire on SVI attribute is always disabled in the policy and service request. For examples of these cases, see configlet examples EVC (Pseudowire Core Connectivity, Bridge Domain, Pseudowire on SVI), page 3-164 and EVC (Pseudowire Core Connectivity, no Bridge Domain, no Pseudowire on SVI), page 3-165. For additional information on the N-PE Pseudo-wire on SVI attribute, see the corresponding coverage in the EVC policy section in the section Interface Attributes Window, page 3-99. The N-PE Pseudo-wire on SVI attribute is not supported for IOS XR devices. All the xconnect commands are configured on L2 subinterfaces/service instance.
Use PseudoWireClass	<p>Check the box to enable the selection of a pseudowire class. This attribute is unchecked by default. Usage notes:</p> <ul style="list-style-type: none"> The pseudowire class name is used for provisioning pw-class commands on IOS and IOS XR devices. See Creating and Modifying Pseudowire Classes, page 3-15 for additional information on pseudowire class support. If Use PseudoWireClass is checked, an additional attribute, PseudoWireClass, appears in the GUI. Click the Select button of PseudoWireClass attribute to choose a pseudowire class previously created in Prime Provisioning. The Use PseudoWireClass attribute is only available if the MPLS core connectivity type was set as PSEUDOWIRE in the Service Options window (see Service Options Window, page 3-90).
AutoPick Bridge Group Name	<p>Check the box to have Prime Provisioning autopick the bridge group name during service request creation. If this check box is unchecked, you are prompted to specify a bridge group name during service request creation (see the next step). Usage notes:</p> <ul style="list-style-type: none"> This attribute only displays for IOS XR devices. If the AutoPick Bridge Group Name check box is unchecked, enter an bridge group name in the Bridge Group Name text field.

Table 3-21 Standard UNI Attributes (continued)

Attribute	Description
AutoPick Bridge Domain/VLAN ID	<p>Check the box to have Prime Provisioning autopick the VLAN ID during service request creation. If this check box is unchecked, you are prompted to specify a VLAN ID during service request creation (see the next step). Usage notes:</p> <ul style="list-style-type: none"> • AutoPick Bridge Domain/VLAN ID consumes a global VLAN ID on the device. • The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool. • The AutoPick Bridge Domain/VLAN ID attribute appears for both Cisco 7600 and ASR 9000 devices. It will be displayed only for non-EVC links.
Bridge Domain/VLAN ID	<p>If the AutoPick Bridge Domain/VLAN ID check box is unchecked, enter an ID number in the text field. Usage notes:</p> <ul style="list-style-type: none"> • If AutoPick Bridge Domain/VLAN ID is checked, this field is non-editable. • When a VLAN ID is manually allocated, Prime Provisioning verifies the VLAN ID to see if it lies within Prime Provisioning's VLAN ID pool. If the VLAN ID is in the pool but not allocated, the VLAN ID is allocated to the service request. If the VLAN ID is in the pool and is already in use, Prime Provisioning prompts you to allocate a different VLAN ID. If the VLAN ID lies outside of the Prime Provisioning VLAN ID pool, Prime Provisioning does not perform any verification about whether the VLAN ID allocated. The operator must ensure the VLAN ID is available. • The Bridge Domain/VLAN ID text field appears for both Cisco 7600 and ASR 9000 devices. It will be displayed only for non-EVC links.
L2VPN Group Name	<p>Choose one of the following from the drop-down list:</p> <ul style="list-style-type: none"> • ISC • VPNSC <p>Usage notes:</p> <ul style="list-style-type: none"> • This attribute is used for provisioning the L2VPN group name on IOS XR devices. • The choices in the drop-down list are derived from a configurable DCPL property. For information about how to define the L2VPN Group Name choices available in the drop-down list, see Defining L2VPN Group Names for IOS XR Devices, page 3-19. • L2VPN Group Name is only applicable for IOS XR devices.
E-Line Name	<p>Enter the point-to-point (p2p) E-line name. Usage notes:</p> <ul style="list-style-type: none"> • If no value is specified for the E-Line Name, Prime Provisioning autogenerates a default name as follows: <ul style="list-style-type: none"> – For PSEUDOWIRE core connectivity type, the format is: <i>DeviceName--VC_ID</i> – For LOCAL core connectivity type, the format is: <i>DeviceName--VLAN_ID</i> <p>If the default name is more than 32 characters, the device names are truncated.</p> • E-Line Name is only applicable for IOS XR devices.

Table 3-22 ATM UNI Attributes

Attribute	Description
Transport Mode	Choose the Transport Mode from the drop-down list. The choices are: <ul style="list-style-type: none"> • VP—Virtual path mode. This is the default. • VC—Virtual circuit mode.
ATM Encapsulation	Choose the ATM Encapsulation from the drop-down list. The choice is: <ul style="list-style-type: none"> • AAL5SNAP
ATM VCD/Sub-Interface #	To specify the ATM virtual channel descriptor (VCD)/subinterface number, enter a value in the ATM VCD/Sub-Interface # field. The value can be from 1 to 2147483647.
ATM VPI	To specify the ATM virtual path identifier (VPI), enter a value in the ATM VPI field. The value can be from 0 to 255.
ATM VCI	To specify the ATM virtual channel identifier (VCI), a value in the ATM VCI field. The value can be from 32 to 65535.
UNI Shutdown	Check the box if you want to leave the UNI port shut during service activation (for example, when the service provider wants to deploy a service in the network but wants to activate it at a later time).
Use Existing PW Class	Check the box to enable the selection of a pseudowire class. This attribute is unchecked by default. Usage notes: <ul style="list-style-type: none"> • If Use Existing PW Class is checked, an additional attribute, Existing PW Class Name, appears in the GUI. Enter the name of a pseudowire class which already exists in the device. • If Use Existing PW Class is checked, the PW Tunnel Selection and Interface Tunnel attributes will disappear from the window. This is to prevent Prime Provisioning from generating the pseudowire class. • The Use PseudoWireClass attribute is only available if the MPLS core connectivity type was set as PSEUDOWIRE in the Service Options window.
N-PE Pseudo-wire on SVI	Check the box to have Prime Provisioning generate forwarding commands under SVIs (switch virtual interfaces). By default, this check box is not checked. In this case, Prime Provisioning generates forwarding commands under the service instance. For an EVC link, the attribute N-PE Pseudo-wire on SVI is dependent on the value of the attribute Configure with Bridge Domain (this is available in the service request workflow in the EVC Service Request Editor window). N-PE Pseudo-wire on SVI, if enabled, will be reflected only when Configure with Bridge Domain is set to true. Otherwise, the service request will not be created with xconnect under SVI, even if N-PE Pseudo-wire on SVI is enabled.

Table 3-22 ATM UNI Attributes (continued)

Attribute	Description
	<p>Usage notes:</p> <ul style="list-style-type: none"> For an ATM link, the attribute N-PE Pseudo-wire on SVI is dependent on the value of the attribute Configure with Bridge Domain (in the EVC Service Request Editor window). N-PE Pseudo-wire on SVI, if enabled, will be reflected only when Configure with Bridge Domain is set to true. Otherwise, the service request will not be created with xconnect under SVI, even if N-PE pseudo-wire on SVI is enabled. Prime Provisioning supports a hybrid configuration for EVC service requests. In a hybrid configuration, the forwarding commands (such as xconnect) for one side of an attachment circuit can be configured under a service instance, and the xconnect configuration for the other side of the attachment circuit can be configured under a switch virtual interface (SVI). N-PE Pseudo-wire on SVI is applicable for all connectivity types (PSEUDOWIRE or LOCAL), but a hybrid SVI configuration is possible only for pseudowire connectivity. When MPLS Core Connectivity Type is set as LOCAL connectivity type, the N-PE Pseudo-wire on SVI attribute is always disabled in the policy and service request. For examples of these cases, see configlet examples EVC (Pseudowire Core Connectivity, Bridge Domain, Pseudowire on SVI), page 3-164 and EVC (Pseudowire Core Connectivity, no Bridge Domain, no Pseudowire on SVI), page 3-165. For additional information on the N-PE Pseudo-wire on SVI attribute, see the corresponding coverage in the EVC policy section in the section Interface Attributes Window, page 3-99. The N-PE Pseudo-wire on SVI attribute is not supported for IOS XR devices. All the xconnect commands are configured on L2 subinterfaces/service instance.
PW Tunnel Selection	<p>Check the box if you want to be able to manually select the Traffic Engineering (TE) tunnel for the pseudowire connecting point-to-point N-PEs. Usage notes:</p> <ul style="list-style-type: none"> Checking the PW Tunnel Selection check box activates the Interface Tunnel attribute field (see the next step). This attribute only appears if the MPLS core connectivity type is set as pseudowire in the EVC policy.
Interface Tunnel	<p>If you checked the PW Tunnel Selection check box, enter the TE tunnel ID in the Interface Tunnel text field. Prime Provisioning uses the tunnel information to create and provision a pseudowire class that describes the pseudowire connection between two N-PEs. This pseudowire class can be shared by more than one pseudowire, as long as the pseudowires share the same tunnel ID and remote loopback address. During service request creation, Prime Provisioning does not check the validity of the tunnel ID number. That is, Prime Provisioning does not verify the existence of the tunnel.</p>
AutoPick Bridge Domain/VLAN ID	<p>Check the box to have Prime Provisioning autopick the VLAN ID during service request creation. If this check box is unchecked, you are prompted to specify a VLAN ID during service request creation (see the next step). Usage notes:</p> <ul style="list-style-type: none"> AutoPick Bridge Domain/VLAN ID consumes a global VLAN ID on the device. The bridge domain VLAN ID is picked from the existing Prime Provisioning VLAN pool.

Table 3-22 ATM UNI Attributes (continued)

Attribute	Description
Bridge Domain/VLAN ID	<p>If the AutoPick Bridge Domain/VLAN ID check box is unchecked, enter an ID number in the Bridge Domain/VLAN ID text field. Usage notes:</p> <ul style="list-style-type: none">• If AutoPick Bridge Domain/VLAN ID is checked, this field is non-editable.• When a VLAN ID is manually allocated, Prime Provisioning verifies the VLAN ID to see if it lies within Prime Provisioning's VLAN ID pool. If the VLAN ID is in the pool but not allocated, the VLAN ID is allocated to the service request. If the VLAN ID is in the pool and is already in use, Prime Provisioning prompts you to allocate a different VLAN ID. If the VLAN ID lies outside of the Prime Provisioning VLAN ID pool, Prime Provisioning does not perform any verification about whether the VLAN ID allocated. The operator must ensure the VLAN ID is available.

Sample Configlets

This section provides sample configlets for EVC service provisioning in Prime Provisioning. It contains the following subsections:

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- [ERS \(EVPL\) \(Point-to-Point\)](#), page 3-123
- [ERS \(EVPL\) \(Point-to-Point, UNI Port Security\)](#), page 3-124
- [ERS \(EVPL\) \(1:1 VLAN Translation\)](#), page 3-125
- [ERS \(EVPL\) \(2:1 VLAN Translation\)](#), page 3-126
- [ERS \(EVPL\) and EWS \(EPL\) \(Local Connect on E-Line\)](#), page 3-129
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- [ATM over MPLS \(VC Mode\)](#), page 3-139
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- [VPLS \(Multipoint, ERMS/EVP-LAN\)](#), page 3-144
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- [EVC \(Pseudowire Core Connectivity, UNI Port Security\)](#), page 3-146
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- [EVC \(Pseudowire Core Connectivity, UNI, and Pseudowire Tunneling\)](#), page 3-148
- [EVC \(Pseudowire Core Connectivity, With Pseudowire Headend Support\)](#), page 3-149
- [EVC \(Pseudowire Core Connectivity, Without Pseudowire Headend Support\)](#), page 3-150
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- [EVC \(VPLS Core Connectivity, no UNI Port Security\)](#), page 3-152
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- [EVC \(VPLS Core Connectivity, EFPs in same UNI, Switchport, CPT\)](#), page 3-159
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- [EVC \(Pseudowire Core Connectivity, Bridge Domain, Pseudowire on SVI\)](#), page 3-164
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- [EVC \(No AutoPick Service Instance Name, No Service Instance Name\)](#), page 3-167
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- EVC (Pseudowire Core Connectivity, Pseudowire Redundancy, “A” – “Z”), page 3-169
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- EVC (Pseudowire Core Connectivity, Static Pseudowire, IOS Device), page 3-176
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- EVC (ATM-Ethernet Interworking, Local Core Connectivity, Point-to-Point Circuit), page 3-192
- EVC (ATM-Ethernet Interworking, Pseudowire Core Connectivity, End-to-End Circuit, with Bridge Domain), page 3-193
- EVC (ATM-Ethernet Interworking, Pseudowire Core Connectivity, End-to-End Circuit, with Bridge Domain), page 3-194
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Overview

The configlets provided in this section show the CLIs generated by Prime Provisioning for particular services and features. Each configlet example provides the following information:

- Service
- Feature
- Devices configuration (network role, hardware platform, relationship of the devices and other relevant information)
- Sample configlets for each device in the configuration
- Comments

**Note**

The configlets generated by Prime Provisioning are only the delta between what needs to be provisioned and what currently exists on the device. This means that if a relevant CLI is already on the device, it does not show up in the associated configlet.

**Note**

The CLIs shown in bold are the most relevant commands.

**Note**

All examples in this section assume an MPLS core.

ERS (EVPL) (Point-to-Point)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: ERS (EVPL) (point-to-point).
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(18)SXF, Sup720-3BXL.
Interface(s): FA8/17.
 - The U-PE is a Cisco 3750ME with 12.2(25)EY1, no port security.
Interface(s): FA1/0/4 – FA1/0/23.
 - L2VPN point-to-point.

Configlets

U-PE	N-PE
<pre>vlan 772 exit ! interface FastEthernet1/0/23 switchport trunk allowed vlan 500,772 ! interface FastEthernet1/0/4 no cdp enable no keepalive no ip address switchport trunk allowed vlan 500,772 spanning-tree bpdupfilter enable mac access-group ISC-FastEthernet1/0/4 in ! mac access-list extended ISC-FastEthernet1/0/4 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 permit any any</pre>	<pre>vlan 772 exit ! interface FastEthernet8/17 switchport trunk allowed vlan 1,451,653,659,766-768,772,878 ! interface Vlan772 no ip address description L2VPN ERS xconnect 99.99.8.99 89027 encapsulation mpls no shutdown</pre>

Comments

- The N-PE is a 7600 with an OSM or SIP-600 module.
- The U-PE is a generic Metro Ethernet (ME) switch. Customer BPDUs are blocked by the PACL.

ERS (EVPL) (Point-to-Point, UNI Port Security)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: ERS (EVPL) (point-to-point) with UNI port security.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(18)SXF, OSM. Interface(s): FA2/18.
 - The U-PE is a Cisco 3550 with IOS 12.2(25)SEC2. Port security is enabled. Interface(s): FA3/31– FA3/23.
 - L2VPN point-to-point.

Configlets

U-PE	N-PE
<pre> vlan 788 exit ! interface FastEthernet3/23 no ip address switchport trunk allowed vlan 783,787-788 ! interface FastEthernet3/31 no cdp enable no keepalive no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan none switchport trunk allowed vlan 788 switchport port-security switchport nonegotiate switchport port-security maximum 45 switchport port-security aging time 34 switchport port-security violation shutdown switchport port-security mac-address 3456.3456.5678 spanning-tree bpdupfilter enable mac access-group ISC-FastEthernet3/31 in ! mac access-list extended ISC-FastEthernet3/31 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 deny any host 1234.3234.3432 permit any any </pre>	<pre> vlan 788 exit ! interface FastEthernet2/18 switchport trunk allowed vlan 350,351,430,630,777,780,783,785-788 ! interface Vlan788 no ip address description L2VPN ERS with UNI port security xconnect 99.99.5.99 89028 encapsulation mpls no shutdown </pre>

Comments

- The N-PE is a 7600 with an OSM or SIP-600 module.
- The U-PE is a generic Metro Ethernet (ME) switch. The customer BPDUs are blocked by the PACL.
- Various UNI port security commands are provisioned.
- A user-defined PACL entry is added to the default PACL.

ERS (EVPL) (1:1 VLAN Translation)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: ERS (EVPL) with 1:1 VLAN translation.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(18)SXF, Sup720-3BXL
Interface(s): FA8/34.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25)EY1. VLAN translation on the NNI port (uplink).
Interface(s): FA1/0/8 – GI1/1/1.
 - L2VPN point-to-point.

Configlets

U-PE	N-PE
<pre> ! vlan 123 exit ! interface FastEthernet1/0/8 no cdp enable no keepalive no ip address switchport trunk allowed vlan 123 switchport nonegotiate switchport port-security maximum 34 switchport port-security aging time 23 switchport port-security violation protect switchport port-security spanning-tree bpdfilter enable mac access-group ISC-FastEthernet1/0/8 in ! interface GigabitEthernet1/1/1 no ip address switchport mode trunk switchport trunk allowed vlan 1,123 switchport vlan mapping 123 778 </pre>	<pre> vlan 778 exit ! interface FastEthernet8/34 switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 1,778 ! interface Vlan778 no ip address description L2VPN ERS 1 to 1 vlan translation xconnect 99.99.8.99 89032 encapsulation mpls no shutdown </pre>

Comments

- VLAN translation is only for L2VPN (point-to-point) ERS (EVPL).
- In this case, the 1:1 VLAN translation occurs on the U-PE, a 3750. It is provisioned on the NNI (uplink) port.
- The customer VLAN 123 is translated to the provider VLAN 778.

ERS (EVPL) (2:1 VLAN Translation)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: ERS (EVPL) with VLAN 2:1 translation. Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(18)SXF, Sup720-3BXL
Interface(s): FA8/34.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25)EY1. VLAN translation on the NNI port (uplink).
Interface(s): FA1/0/5 – GI1/1/1.
 - L2VPN point-to-point.

Configlets

U-PE	N-PE
<pre> vlan 567 exit ! interface FastEthernet1/0/5 no cdp enable no keepalive no ip address switchport switchport access vlan 567 switchport mode dot1q-tunnel switchport trunk allowed vlan none switchport nonegotiate spanning-tree bpdupfilter enable mac access-group ISC-FastEthernet1/0/5 in ! interface GigabitEthernet1/1/1 no ip address switchport trunk allowed vlan 1,123,567 switchport vlan mapping dot1q-tunnel 567 234 779 ! mac access-list extended ISC-FastEthernet1/0/5 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 permit any any </pre>	<pre> vlan 779 exit ! interface FastEthernet8/34 switchport trunk allowed vlan 1,778-779 ! interface Vlan779 no ip address description L2VPN ERS 2 to 1 vlan translation xconnect 99.99.8.99 89033 encapsulation mpls no shutdown </pre>

Comments

- VLAN translation is only for L2VPN (point-to-point) ERS (EVPL).
- In this case, the 2:1 VLAN translation occurs on the U-PE, a 3750. It is provisioned on the NNI (uplink) port.
- The customer VLAN 123 and the provider VLAN 234 (as part of Q -in-Q) are translated to a new provider VLAN 779.

ERS (Pseudowire Class, E-Line, L2VPN Group Name, IOS XR Device)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: ERS (EVPL).
- Device configuration:
 - The N-PE is a CRS-1 with IOS XR 3.6.1 or later.
 - UNI on N-PE.
 - UNI on U-PE.

Configlets

U-PE	N-PE
<pre> ! vlan 700 exit ! interface FastEthernet1/0/2 switchport trunk encapsulation dot1q switchport trunk allowed vlan 700 switchport mode trunk switchport nonegotiate no keepalive mac access-group ISC-FastEthernet1/0/2 in no cdp enable spanning-tree bpdufilter enable ! ! interface GigabitEthernet1/0/1 switchport trunk encapsulation dot1q switchport trunk allowed vlan 700 switchport mode trunk keepalive 10 ! ! mac access-list extended ISC-FastEthernet1/0/2 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 permit any any ! </pre>	<pre> ! interface GigabitEthernet0/3/1/1.700 l2transport dot1q vlan 700 ! l2vpn pw-class PW_AD3-AD7_Customer1 encapsulation mpls transport-mode vlan preferred-path interface tunnel-te 1370 fallback disable ! ! xconnect group L2VPN_Customer1-Gold_class p2p GoldPkg_AD3-AD7_Customer1 interface GigabitEthernet0/3/1/1.700 neighbor 192.169.105.30 pw-id 1000 pw-class PW_AD3-AD7_Customer1 ! ! </pre>

Comments

- The N-PE is a CRS-1 with IOS XR 3.7.
- The pseudowire class feature is configured with various associated attributes like encapsulation, transport mode, preferred-path, and fallback option.
- The disable fallback option is required for IOS XR 3.6.1 and optional for IOS XR 3.7 and later.
- The E-Line name (**p2p** command) and L2VPN Group Name (**xconnect group** command) is user configured.

ERS (EVPL) (NBI Enhancements for L2VPN, IOS Device)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: ERS (EVPL).
- Device configuration:
 - The N-PE is a 12.2(18)SXF with IOS.
 - The U-PE is a 12.2(25)EY4with IOS.
 - UNI on N-PE.
 - UNI on U-PE.

Configlets

U-PE	N-PE
<pre> ! vlan 3200 exit ! interface FastEthernet1/0/2 no cdp enable no ip address duplex auto switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan none switchport trunk allowed vlan 3200 switchport nonegotiate switchport port-security aging type inactivity switchport port-security maximum 100 switchport port-security aging time 1000 switchport port-security violation protect switchport port-security storm-control unicast level 1.0 storm-control broadcast level 50.0 storm-control multicast level 50.0 shutdown keepalive spanning-tree bpdudfilter enable ! interface GigabitEthernet1/0/1 no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 3200 ! </pre>	<pre> ! vlan 3300 exit ! interface FastEthernet1/0/24 no cdp enable no ip address duplex auto switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan none switchport trunk allowed vlan 3300 switchport nonegotiate switchport port-security aging type inactivity switchport port-security maximum 100 switchport port-security aging time 1000 switchport port-security violation protect switchport port-security storm-control unicast level 1.0 storm-control broadcast level 50.0 storm-control multicast level 50.0 shutdown keepalive spanning-tree bpdudfilter enable ! interface Vlan3300 no ip address xconnect 192.169.105.40 7502 encapsulation mpls no shutdown ! </pre>

Comments

None.

ERS (EVPL) and EWS (EPL) (Local Connect on E-Line)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: ERS (EVPL) and EWS (EPL).
- Device configuration:
 - The N-PE is a CRS-1 with IOS XR 3.6 or later.
 - The U-PE is a 12.2(18)SXF with IOS.

Configlets

U-PE	N-PE
	<pre> interface GigabitEthernet0/0/0/2.559 dot1q vlan 559 l2transport ! interface GigabitEthernet0/0/0/4.559 dot1q vlan 559 l2transport ! l2vpn xconnect group ISC p2p c1-test-12-crs1-1--0--559 interface GigabitEthernet0/0/0/2.559 interface GigabitEthernet0/0/0/4.559 ! ! ! </pre>

Comments

- The default E-Line name has changed for local connect configlets.
- The format of the default E-line name is:
device_name_with_underscores--VCID--VLANID

ERS (EVPL), EWS (EPL), ATM, or Frame Relay (Additional Template Variables for L2VPN, IOS and IOS XR Device)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: ERS (EVPL), EWS (EPL), ATM and Frame Relay.
- Device configuration:
 - The N-PE is a 12.2(18)SXF with IOS for ERS (EVPL), EWS (EPL), Frame Relay service.
 - The N-PE is a CRS-1 with IOS XR 3.6 or later for ERS (EVPL), EWS (EPL) service; and IOS XR 3.7 or later for ATM service (ATM port mode).
 - The U-PE is a 12.2(25)EY4 with IOS for ERS (EVPL) or EWS (EPL) service.

Configlets

U-PE	N-PE
(None)	<p>Template Content:</p> <pre>interface Loopback0 description LocalLoopbackAddress=\$L2VPNLocalLoopback LocalHostName=\$L2VPNLocalHostName RemoteLoopbackAddress=\$L2VPNRemoteLoopback RemoteHostName=\$L2VPNRemoteHostName</pre> <p>Configlets:</p> <pre>interface Loopback0 description LocalLoopbackAddress= 192.169.105.40 LocalHostName=c1-test-12-7600-2 RemoteLoopbackAddress=192.169.105.80 RemoteHostName= c1-test-12-7600-4</pre>

Comments

- These four variables are supported only on the N-PE.
- The values will be empty for all other device roles (U-PE, PE-AGG, and CE).

EWS (EPL) (Point-to-Point)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: EWS (EPL) (point-to-point).
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(18)SXF, Sup720-3BXL.
Interface(s): FA8/17.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25)EY1. No port security, no tunneling.
Interface(s): FA1/0/20 – FA1/0/23.
 - L2VPN point-to-point.
 - Q-in-Q UNI.

Configlets

U-PE	N-PE
<pre> system mtu 1522 ! vlan 774 exit ! interface FastEthernet1/0/20 no cdp enable no keepalive switchport switchport access vlan 774 switchport mode dot1q-tunnel switchport nonegotiate spanning-tree portfast spanning-tree bpdupfilter enable ! interface FastEthernet1/0/23 no ip address switchport trunk allowed vlan 774,787-788 </pre>	<pre> vlan 774 exit ! interface FastEthernet8/17 switchport trunk allowed vlan 1,451,653,659,766-768,772,773-774,878 ! interface Vlan774 no ip address description L2VPN EWS xconnect 99.99.8.99 89029 encapsulation mpls no shutdown </pre>

Comments

- The N-PE is a 7600 with a OSM or SIP-600 module. Provisioning is the same as the ERS (EVPL) example.
- The U-PE is a generic Metro Ethernet (ME) switch.
- No PACL provisioned by default. BPDU can be tunneled if desired.
- The system MTU needs to set to 1522 to handle the extra 4 bytes of Q-in-Q frames.

EWS (EPL) (Point-to-Point, UNI Port Security, BPDU Tunneling)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: EWS (EPL) (point-to-point) with Port security, BPDU tunneling.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(18)SXF, Sup720-3BXL.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25)EY1. No port security, with tunneling.
 - L2VPN point-to-point.
 - Q-in-Q UNI.

Configlets

U-PE	N-PE
<pre> system mtu 1522 ! vlan 775 exit ! system mtu 1522 ! vlan 775 exit ! interface FastEthernet1/0/19 no cdp enable no keepalive switchport switchport access vlan 775 switchport mode dot1q-tunnel switchport nonegotiate switchport port-security maximum 34 switchport port-security aging time 32 switchport port-security violation shutdown switchport port-security l2protocol-tunnel cdp l2protocol-tunnel stp l2protocol-tunnel vtp l2protocol-tunnel shutdown-threshold cdp 88 l2protocol-tunnel shutdown-threshold stp 99 l2protocol-tunnel shutdown-threshold vtp 56 l2protocol-tunnel drop-threshold cdp 56 l2protocol-tunnel drop-threshold stp 64 l2protocol-tunnel drop-threshold vtp 34 storm-control unicast level 34.0 storm-control broadcast level 23.0 storm-control multicast level 12.0 spanning-tree portfast spanning-tree bpdupfilter enable mac access-group ISC-FastEthernet1/0/19 in interface FastEthernet1/0/23 no ip address switchport trunk allowed vlan 774-775,787-788 ! mac access-list extended ISC-FastEthernet1/0/19 no permit any any deny any host 3456.3456.1234 permit any any </pre>	<pre> vlan 775 exit ! interface FastEthernet8/17 switchport trunk allowed vlan 1,451,653,659,766-768,772,773-775,878 ! interface Vlan775 no ip address description L2VPN EWS xconnect 99.99.8.99 89029 encapsulation mpls no shutdown </pre>

Comments

- The N-PE is a 7600 with an OSM or SIP-600 module. Provisioning is the same as the ERS (EVPL) example.
- The U-PE is a generic Metro Ethernet (ME) switch.
- PACL with one user-defined entry.
- BPDUs (CDP, STP and VTP) are tunneled through the MPLS core.
- Storm control is enabled for unicast, multicast, and broadcast.

EWS (EPL) (Hybrid)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: EWS (EPL) hybrid. One side is EWS (EPL) UNI; the other side is ERS (EVPL) NNI.
- Device configuration:
 - The N-PE is a Cisco 7600 with 12.2(18)SXF, Sup720-3BXL.
Interface(s): FA8/17.
 - The U-PE is a Cisco 3750ME with 12.2(25)EY1. No port security, with tunneling.
Interface(s): FA1/0/20 – FA1/0/23.
 - L2VPN point-to-point.
 - Q-in-Q UNI.

**Note**

The first configlet example is the EWS (EPL) side (UNI). The second configlet is the ERS (EVPL) side (NNI).

Configlets (EWS)

U-PE	N-PE
<pre> system mtu 1522 ! vlan 775 exit ! system mtu 1522 ! vlan 775 exit ! interface FastEthernet1/0/19 no cdp enable no keepalive switchport switchport access vlan 775 switchport mode dot1q-tunnel switchport nonegotiate switchport port-security maximum 34 switchport port-security aging time 32 switchport port-security violation shutdown switchport port-security l2protocol-tunnel cdp l2protocol-tunnel stp l2protocol-tunnel vtp l2protocol-tunnel shutdown-threshold cdp 88 l2protocol-tunnel shutdown-threshold stp 99 l2protocol-tunnel shutdown-threshold vtp 56 l2protocol-tunnel drop-threshold cdp 56 l2protocol-tunnel drop-threshold stp 64 l2protocol-tunnel drop-threshold vtp 34 storm-control unicast level 34.0 storm-control broadcast level 23.0 storm-control multicast level 12.0 spanning-tree portfast spanning-tree bpdupfilter enable mac access-group ISC-FastEthernet1/0/19 in interface FastEthernet1/0/23 no ip address switchport trunk allowed vlan 774-775,787-788 ! mac access-list extended ISC-FastEthernet1/0/19 no permit any any deny any host 3456.3456.1234 permit any any </pre>	<pre> vlan 775 exit ! interface FastEthernet8/17 switchport trunk allowed vlan 1,451,653,659,766-768,772,773-775,878 ! interface Vlan775 no ip address description L2VPN EWS xconnect 99.99.8.99 89029 encapsulation mpls no shutdown </pre>

Comments

- This is the EWS (EPL) side (UNI).
- N-PE is 7600 with an OSM or a SIP-600 module. Provisioning is the same as the ERS (EVPL).
- The U-PE is a generic Metro Ethernet (ME) switch.
- PACL with one user-defined entry.
- BPDUs (cdp, stp and vtp) are tunneled through the MPLS core.
- Storm control is enabled for unicast, multicast, and broadcast.

Sample Configlets

Configlets (ERS)

U-PE	N-PE
<pre> system mtu 1522 vlan 775 exit interface FastEthernet1/17 switchport trunk allowed vlan 1,451,653,659,766-768,772,773-775,878 interface FastEthernet1/10 switchport trunk allowed vlan 1,451,653,659,766-768,772,773-775,878 </pre>	<pre> vlan 775 exit ! interface FastEthernet8/17 switchport trunk allowed vlan 1,451,653,659,766-768,772,773-775,878 ! interface Vlan775 no ip address description L2VPN EWS xconnect 99.99.8.99 89029 encapsulation mpls no shutdown </pre>

Comments

- This is the ERS (EVPL) side (NNI).
- The N-PE is a 7600 with an OSM or a SIP-600 module. Provisioning is the same as the ERS (EVPL).
- The U-PE is really a PE-AGG. It connects to the wholesale customer as an NNI. Both ports are regular NNI ports.

EWS (EPL) (Pseudowire Class, E-Line, L2VPN Group Name, IOS XR Device)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: EWS (EPL).
- Device configuration:
 - The N-PE is a CRS-1 with IOS XR 3.6.1 or later.
 - UNI on U-PE.

Configlets

U-PE	N-PE
<pre> ! system mtu 1522 ! vlan 700 exit ! interface FastEthernet1/0/2 switchport switchport access vlan 700 switchport mode dot1q-tunnel switchport nonegotiate no keepalive no cdp enable spanning-tree portfast spanning-tree bpdupfilter enable ! interface GigabitEthernet1/0/1 no ip address switchport switchport trunk encapsulation dot1q switchport trunk allowed vlan 700 switchport mode trunk ! </pre>	<pre> ! interface GigabitEthernet0/3/1/1.700 l2transport dot1q vlan 700 ! ! l2vpn pw-class PW_AD7-AD3_Cutsomer2 encapsulation mpls transport-mode ethernet preferred-path interface tunnel-te 2730 ! ! xconnect group ISC p2p cl-test-12-12404-2--1000 interface GigabitEthernet0/3/1/1.700 neighbor 192.169.105.30 pw-id 1000 pw-class PW_AD7-AD3_Cutsomer2 ! </pre>

Comments

- The N-PE is a CRS-1 router with IOS XR 3.7.
- The pseudowire class feature is configured with various associated attributes like encapsulation, transport mode, preferred-path, and fallback option
- The disable fallback option is required for IOS XR 3.6.1 and optional for IOS XR 3.7 and later.
- The E-Line name (**p2p** command) and L2VPN Group Name (**xconnect group** command) is an Prime Provisioning-generated default value, if user input is not provided.

EWS (EPL) (NBI Enhancements for L2VPN, IOS Device)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: EWS (EPL).
- Device configuration:
 - The N-PE is a 12.2(18)SXF with IOS.
 - The U-PE is a 12.2(25)EY4with IOS.
 - UNI on N-PE.
 - UNI on U-PE.

Configlets

U-PE	N-PE
<pre> ! vlan 3201 exit ! interface FastEthernet1/0/2 no cdp enable no ip address duplex auto switchport switchport access vlan 3201 switchport mode dot1q-tunnel switchport nonegotiate switchport port-security aging type inactivity switchport port-security maximum 100 switchport port-security aging time 1000 switchport port-security violation protect switchport port-security storm-control unicast level 1.0 storm-control broadcast level 50.0 storm-control multicast level 50.0 shutdown keepalive spanning-tree bpdufilter enable ! interface GigabitEthernet1/0/1 no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 3201 ! </pre>	<pre> ! vlan 3301 exit ! interface FastEthernet1/0/24 no cdp enable no ip address duplex auto switchport switchport access vlan 3301 switchport mode dot1q-tunnel switchport nonegotiate switchport port-security aging type inactivity switchport port-security maximum 100 switchport port-security aging time 1000 switchport port-security violation protect switchport port-security storm-control unicast level 1.0 storm-control broadcast level 50.0 storm-control multicast level 50.0 shutdown keepalive spanning-tree bpdufilter enable ! interface Vlan3301 no ip address xconnect 192.169.105.40 7502 encapsulation mpls no shutdown ! </pre>

Comments

None.

ATM over MPLS (VC Mode)

Configuration

- Service: L2VPN.
- Feature: ATM over MPLS (ATMoMPLS, a type of AToM) in VC mode.
- Device configuration:
 - The N-PE is a Cisco 7200 with IOS 12.0(28)S.
 - No CE.
 - No U-PE.
 - L2VPN point-to-point (ATMoMPLS).
 - C7200 (ATM2/0).

Configlets

U-PE	N-PE
(None)	<pre>interface ATM2/0.34234 point-to-point pvc 213/423 l2transport encapsulation aal5 xconnect 99.99.4.99 89025 encapsulation mpls</pre>

Comments

- The N-PE is any MPLS-enabled router.
- L2VPN provisioning is on the ATM VC connection.

ATM over MPLS (VP Mode)

Configuration

- Service: L2VPN.
- Feature: ATM over MPLS (ATMoMPLS, a type of AToM) in VP mode.
- Device configuration:
 - The N-PE is a Cisco 7200 with IOS 12.0(28)S.
 - Interface(s): ATM2/0.
 - No CE.
 - No U-PE.
 - L2VPN point-to-point (ATMoMPLS).

Configlets

U-PE	N-PE
(None)	<pre>pseudowire-class ISC-pw-tunnel-123 encapsulation mpls preferred-path interface tunnel123 disable-fallback ! interface ATM2/0 atm pvp 131 12transport xconnect 99.99.4.99 89024 pw-class ISC-pw-tunnel-123</pre>

Comments

- The N-PE is any MPLS-enabled router.
- L2VPN provisioning is on the ATM VP connection.
- The L2VPN pseudowire is mapped to a TE tunnel.

ATM (Port Mode, Pseudowire Class, E-Line, L2VPN Group Name, IOS XR Device)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: ATM.
- Device configuration:
 - The N-PE is a CRS-1 with IOS XR 3.7 or later for ATM service (port mode only).
 - UNI on N-PE.

Configlets

U-PE	N-PE
(None)	<pre>interface ATM0/1/0/0 description UNIDesc_AC1 l2transport ! ! l2vpn pw-class PWClass-1 encapsulation mpls preferred-path interface tunnel-te 500 fallback disable ! ! xconnect group ISC p2p ELine_AC1 interface ATM0/1/0/0 neighbor 192.169.105.70 pw-id 100 pw-class PWClass-1 !</pre>

Comments

- The N-PE is a CRS-1 router.
- The pseudowire class feature is optional and not configured.
- The E-Line name (**p2p** command) and L2VPN Group Name (**xconnect group** command) are user configured.
- Only PORT mode is supported in IOS XR.
- This PORT mode will not generate any specific command, such as **pvp** or **pvc**, on IOS XR devices.
- The ATM interface is included under **xconnect**.

Frame Relay over MPLS

Configuration

- Service: L2VPN.
- Feature: Frame Relay over MPLS (FRoMPLS, a type of AToM).
- Device configuration:
 - The N-PE is a Cisco 7200 with IOS 12.0(28)S.
 - Interface(s): ATM2/0.
 - No CE.
 - No U-PE.
 - L2VPN point-to-point (ATMoMPLS).

Configlets

U-PE	N-PE
(None)	<pre>interface Serial1/1 exit ! connect C1_89001 Serial1/1 135 12transport xconnect 99.99.4.99 89001 encapsulation mpls</pre>

Comments

- The N-PE is any MPLS-enabled router.
- L2VPN provisioning is on the serial port for the Frame Relay connection.

Frame Relay (DLCI Mode)

Configuration

- Service: L2VPN over a L2TPv3 core.
- Feature: FR in DLCI mode.
- Device configuration:
 - The N-PE is a Cisco 7200 with IOS 12.0(28)S.
 - Interface(s): ATM2/0.
 - No CE.
 - No U-PE.
 - L2VPN point-to-point (ATMoMPLS).

Configlets

U-PE	N-PE
(None)	<pre>pseudowire-class ISC-pw-dynamic-default encapsulation l2tpv3 ip local interface Loopback10 ip dfbit set ! interface Serial3/2 encapsulation frame-relay exit ! connect ISC_1054 Serial3/2 86 l2transport xconnect 10.9.1.1 1054 encapsulation l2tpv3 pw-class ISC-pw-dynamic-default</pre>

Comments

- The N-PE is any L2TPv3 enabled router.
- L2VPN provisioning is on the serial port for the Frame Relay connection.

VPLS (Multipoint, ERMS/EVP-LAN)

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: VPLS (multipoint) ERMS (EVP-LAN).
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(18)SXF, Sup720-3BX.L
Interface(s): FA2/18.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25)EY1. No port security, no tunneling.
Interface(s): FA1/0/21 – FA1/0/23.
 - VPLS Multipoint VPN with VLAN 767.

Configlets

U-PE	N-PE
<pre>vlan 767 exit ! interface FastEthernet1/0/21 no cdp enable no keepalive no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan none switchport trunk allowed vlan 767 switchport nonegotiate spanning-tree bpdupfilter enable mac access-group ISC-FastEthernet1/0/21 in ! interface FastEthernet1/0/23 no ip address mac access-list extended ISC-FastEthernet1/0/21 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 permit any any</pre>	<pre>12 vfi vpls_ers_1-0 manual vpn id 89017 neighbor 99.99.10.9 encapsulation mpls neighbor 99.99.5.99 encapsulation mpls ! vlan 767 exit ! interface FastEthernet2/18 switchport trunk allowed vlan 350,351,430,630,767,780,783,785-791 ! interface Vlan767 no ip address description VPLS ERS xconnect vfi vpls_ers_1-0 no shutdown</pre>

Comments

- The N-PE is a 7600 with OSM or SIP-600 module.
- The VFI contains all the N-PEs (neighbors) that this N-PE talks to.
- The U-PE is a generic Metro Ethernet (ME) switch. The customer BPDU's are blocked by the PACL. The VPLS ERMS (EVP-LAN) UNI is the same as the L2VPN (point-to-point) ERS (EVPL) UNI.
- The SVI (interface 767) refers to the global VFI, which contains multiple peering N-PEs.

VPLS (Multipoint, EMS/EP-LAN), BPDU Tunneling

Configuration

- Service: L2VPN/Metro Ethernet.
- Feature: VPLS (multipoint) EMS (EP-LAN) with BPDU tunneling.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(18)SXF, Sup720-3BXL.
Interface(s): FA2/18.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25)EY1. No port security, no tunneling.
Interface(s): FA1/0/12 – FA1/0/23.
 - VPLS Multipoint VPN, with VLAN 767.
 - Q-in-Q UNI.

Configlets

U-PE	N-PE
<pre> system mtu 1522 ! errdisable recovery interval 33 ! vlan 776 exit ! interface FastEthernet1/0/12 no cdp enable no keepalive switchport switchport access vlan 776 switchport mode dot1q-tunnel switchport nonegotiate l2protocol-tunnel cdp l2protocol-tunnel stp l2protocol-tunnel vtp l2protocol-tunnel shutdown-threshold cdp 88 l2protocol-tunnel shutdown-threshold stp 64 l2protocol-tunnel shutdown-threshold vtp 77 l2protocol-tunnel drop-threshold cdp 34 l2protocol-tunnel drop-threshold stp 23 l2protocol-tunnel drop-threshold vtp 45 no shutdown spanning-tree portfast spanning-tree bpdupfilter enable </pre>	<pre> l2 vfi vpls_ews-89019 manual vpn id 89019 neighbor 99.99.8.99 encapsulation mpls ! vlan 776 exit ! interface FastEthernet8/17 switchport trunk allowed vlan 1,451,653,659,766-768,772-776,878 ! interface Vlan776 no ip address description VPLS EWS xconnect vfi vpls_ews-89019 no shutdown </pre>

Comments

- The N-PE is a 7600 with an OSM or SIP-600 module.
- The VFI contains all the N-PEs (neighbors) that this N-PE talks to.
- The VPLS EMS (EP-LAN) UNI is the same as L2VPN (point-to-point) EWS (EPL) UNI.
- The SVI is the same as VPLS ERS (EVP-LAN) SVI.

EVC (Pseudowire Core Connectivity, UNI Port Security)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with pseudowire core connectivity, with UNI port security.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33)SRB3.
Interface(s): GI2/0/0.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25)EY2. Port security is enabled.
Interface(s): FA1/14– FA3/23.

Configlets

U-PE	N-PE
<pre> vlan 788 exit ! interface FastEthernet3/23 no ip address switchport trunk allowed vlan 783,787-788 ! interface FastEthernet1/14 no cdp enable no keepalive no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan none switchport trunk allowed vlan 788 switchport port-security switchport nonegotiate switchport port-security maximum 45 switchport port-security aging time 34 switchport port-security violation shutdown switchport port-security mac-address 3456.3456.5678 spanning-tree bpdudfilter enable mac access-group ISC-FastEthernet3/23 in ! mac access-list extended ISC-FastEthernet3/31 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 deny any host 1234.3234.3432 permit any any </pre>	<pre> interface GigabitEthernet4/0/1 no shut service instance 10 ethernet encapsulation dot1q 500 rewrite ingress tag push dot1q 555 symmetric xconnect 192.169.105.20 505 encapsulation mpls </pre>

Comments

- UNI on U-PE.
- Single match tag is performed.
- The rewrite operation **push** pushes the outer VLAN tag of 555.

EVC (Pseudowire Core Connectivity, UNI, without Port Security, with Bridge Domain)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with pseudowire core connectivity, with UNI, without port security, and with bridge domain.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33)SRB3.
Interface(s): GI2/0/0.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25)EY2. Port security is enabled.
Interface(s): FA1/14– FA3/23.

Configlets

U-PE	N-PE
<pre>vlan 772 exit ! interface FastEthernet3/23 switchport trunk allowed vlan 500,772 ! interface FastEthernet1/14 no cdp enable no keepalive no ip address switchport trunk allowed vlan 500,772 spanning-tree bpdupfilter enable mac access-group ISC-FastEthernet3/23 in ! mac access-list extended ISC-FastEthernet1/14 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 permit any any</pre>	<pre>vlan 100 interface GigabitEthernet2/0/0 no shut service instance 10 ethernet encapsulation dot1q 500 rewrite ingress tag push dot1q 23 second-dot1q 41 symmetric bridge-domain 100 split-horizon Interface Vlan100 no shut xconnect 192.169.105.20 101 encapsulation mpls</pre>

Comments

- UNI on U-PE.
- Single match tag is performed.
- The rewrite operation **push** pushes two tags.

EVC (Pseudowire Core Connectivity, UNI, and Pseudowire Tunneling)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with pseudowire core connectivity, with UNI, with pseudowire tunneling.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
 - Interface(s): GI4/0/0 <-> GI2/0/0.

Configlets

U-PE	N-PE
(None)	<pre>pseudowire-class ISC-pw-tunnel-2147 encapsulation mpls preferred-path interface Tunnel2147 disable-fallback interface GigabitEthernet4/0/0 service instance 1 ethernet encapsulation dot1q 11 second-dot1q 41 rewrite ingress tag pop 2 symmetric xconnect pw-class ISC-pw-tunnel-2147</pre>

Comments

- UNI on N-PE (the CE is directly connected).
- Match of both tags is performed.
- The rewrite operation pops both the inner and outer VLAN tags.

EVC (Pseudowire Core Connectivity, With Pseudowire Headend Support)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with pseudowire core connectivity, with pseudowire headend support.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
 - Interface(s): GI4/0/0 <-> GI2/0/0.

Configlets

U-PE	N-PE
(None)	<pre>interface PW-Ether4909 no shutdown l2vpn xconnect group ISC p2p Demo_Eline_Head interface PW-Ether4909 neighbor ipv4 10.10.10.10 pw-id 1734</pre>

Comments

- When “Configure PWHE” check box is checked, the interface acts as a pseudowire-ether interface.

EVC (Pseudowire Core Connectivity, Without Pseudowire Headend Support)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with pseudowire core connectivity, without pseudowire headend support.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
 - Interface(s): GI4/0/0 <-> GI2/0/0.

Configlets

U-PE	N-PE
(None)	<pre>interface PW-Ether4909.294 l2transport description EVC-JOBID:2 encapsulation dot1q 294 no shutdown l2vpn bridge group bgname bridge-domain bdname interface PW-Ether4909.294 neighbor 192.18.156.7 pw-id 3651</pre>

Comments

- When “Configure PWHE” check box is unchecked, the interface of pseudowire acts similar to that of gigabit interface where sub-interfaces can be configured.

EVC (VPLS Core Connectivity, UNI Port Security)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with VPLS core connectivity, with UNI port security.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GI4/0/1.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2. Port security is enabled.
Interface(s): FA1/14– FA3/23.

Configlets

U-PE	N-PE
<pre> vlan 788 exit ! interface FastEthernet3/23 no ip address switchport trunk allowed vlan 783,787-788 ! interface FastEthernet1/14 no cdp enable no keepalive no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan none switchport trunk allowed vlan 788 switchport port-security switchport nonegotiate switchport port-security maximum 58 switchport port-security aging time 85 switchport port-security violation shutdown switchport port-security mac-address 1252.1254.2544 spanning-tree bpdupfilter enable mac access-group ISC-FastEthernet3/23 in ! mac access-list extended ISC-FastEthernet3/31 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 deny any host 1234.3234.3432 permit any any </pre>	<pre> 12 vfi attest-226 manual vpn id 226 neighbor 192.169.105.20 encapsulation mpls vlan 200 bridge-domain 200 split-horizon interface GigabitEthernet4/0/1 no shut service instance 10 ethernet encapsulation dot1q 500 rewrite ingress tag translate 1-to-1 dot1q 222 symmetric Interface vlan 200 xconnect vfi attest-226 </pre>

Comments

- UNI on U-PE.
- The rewrite operation translates the incoming VLAN tag 500 to 222.

EVC (VPLS Core Connectivity, no UNI Port Security)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with VPLS core connectivity, without UNI port security.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GI4/0/1.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2.
Interface(s): FA1/14– FA3/23.

Configlets

U-PE	N-PE
<pre>vlan 772 exit ! interface FastEthernet3/23 switchport trunk allowed vlan 500,772 ! interface FastEthernet1/14 no cdp enable no keepalive no ip address switchport trunk allowed vlan 500,772 spanning-tree bpdupfilter enable mac access-group ISC-FastEthernet3/23 in ! mac access-list extended ISC-FastEthernet1/14 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 permit any any</pre>	<pre>l2 vfi attest1-458 manual vpn id 452 neighbor 192.169.105.20 encapsulation mpls vlan 200 bridge-domain 200 split-horizon interface GigabitEthernet4/0/1 no shut service instance 10 ethernet encapsulation dot1q 500 rewrite ingress tag translate 1-to-2 dot1q 222 second-dot1q 41 symmetric Interface vlan 200 xconnect vfi attest1-458</pre>

Comments

- UNI on U-PE.
- The rewrite operation translates the incoming VLAN tag 500 to two tags, 222 and 41.

EVC DOT1Q Encapsulation

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with PW/LC/VPLS core connectivity with UNI service instance ID 507 and outer VLAN as 508. Bridge-Domain is used as 508.
- Additional Properties: Encapsulation is Dot1Q at UNI.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 15.3(3)S1.
 - Interface(s): Gi2/7.
 - The U-PE is a Cisco ME1200 with ME1200 OS Software Build 15.4-2.SN
 - Interface(s): Gi1/4 as UNI and Gi1/5 as Uplink interface

■ Sample Configlets

Configlets

U-PE (ME1200) (Sheet 1 of 2)		N-PE (7600)
UNI Interface	Uplink Interface	
<pre> <soapRequest soapAction="test#addECE" urlPath="SandinoSoap/evc"> <inputMsgDoc> <ece_configuration> <ece_id>507</ece_id> <control> <ingress_match> <uni_ports> <GigabitEthernet_1_UNI>>false</Gigabi tEthernet_1_UNI> <GigabitEthernet_2_UNI>>false</Gigabi tEthernet_2_UNI> <GigabitEthernet_3_UNI>>false</Gigabi tEthernet_3_UNI> <GigabitEthernet_4_UNI>>true</Gigabit Ethernet_4_UNI> <GigabitEthernet_5_UNI>>false</Gigabi tEthernet_5_UNI> <GigabitEthernet_6_UNI>>false</Gigabi tEthernet_6_UNI> </uni_ports> <outer_tag_match> <match_type> <c_tagged/> </match_type> <match_fields> <vlan_id_filter> <specific>508</specific> </vlan_id_filter> <inner_pcp> <val_any/> </inner_pcp> <inner_dei> <any/> </inner_dei> </match_fields> </outer_tag_match> <inner_tag_match> <match_type> <any/> </match_type> <match_fields> <vlan_id_filter> <specific>1</specific> </vlan_id_filter> <inner_pcp> <val_any/> </inner_pcp> <inner_dei> <any/> </inner_dei> </match_fields> </inner_tag_match> <mac_params> <smac_filter> <any/> </smac_filter> <dmac_filter> <any/> </dmac_filter> </mac_params> <frame_type> <any/> </frame_type> </ingress_match> <actions> </pre>	<pre> <soapRequest soapAction="test#addEVC" urlPath="SandinoSoap/evc "> <inputMsgDoc> <evcConfiguration> <instance>508</instance> <policer_id>1</policer_i d> <nni_vid>508</nni_vid> <internal_vid>508</inter nal_vid> <nni_ports> <GigabitEthernet_1_NNI>f alse</GigabitEthernet_1_ NNI> <GigabitEthernet_2_NNI>f alse</GigabitEthernet_2_ NNI> <GigabitEthernet_3_NNI>f alse</GigabitEthernet_3_ NNI> <GigabitEthernet_4_NNI>f alse</GigabitEthernet_4_ NNI> <GigabitEthernet_5_NNI>t rue</GigabitEthernet_5_N NI> <GigabitEthernet_6_NNI>f alse</GigabitEthernet_6_ NNI> </nni_ports> <learning>>true</learning > </evcConfiguration> </inputMsgDoc> </soapRequest> </pre>	<pre> interface GigabitEthernet2/7 service instance 507 ethernet description EVC-JOBID:7 encapsulation dot1q 508 </pre>

U-PE (ME1200) (continued) (Sheet 2 of 2)		
UNI Interface	Uplink Interface	N-PE (7600)
<pre> <direction> <both/> </direction> <rule_type> <both/> </rule_type> <tx_lookup> <vid_only/> </tx_lookup> <evc_id> <specific>508</specific> </evc_id> <policer_id> <none/> </policer_id> <tag_pop_count>0</tag_pop_count> <policy_id>0</policy_id> <class> <disabled/> </class> <drop_precedence> <disabled/> </drop_precedence> </actions> <egress_outer_tag> <mode> <disabled/> </mode> <vlan_id>4095</vlan_id> <pcp_mode> <classified/> </pcp_mode> <pcp_value>0</pcp_value> <dei_mode> <classified/> </dei_mode> <dei_value>0</dei_value> </egress_outer_tag> <egress_inner_tag> <type> <untagged/> </type> <vlan_id>4095</vlan_id> <pcp_mode> <classified/> </pcp_mode> <pcp_value>0</pcp_value> <dei_mode> <classified/> </dei_mode> <dei_value>0</dei_value> </egress_inner_tag> </control> </ece_configuration> </inputMsgDoc> </soapRequest> </pre>		

Comments

- UNI on U-PE.
- The rewrite operation translates the incoming VLAN tag 500 to two tags, 222 and 41.

EVC (VPLS Core Connectivity, With E-Tree Role, Communication between the Spokes of Different Hubs)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with VPLS core connectivity, with E-Tree Role, Communication between the Spokes of Different Hubs.
- Device configuration:
 - Cisco 7600 with IOS Version 15.4(1)S as NPE(LEAF and ROOT).



Note

Other devices that support similar configurations are Cisco ASR9k with IOS XR 4.3.1, Cisco ME3600 with IOS Version 15.3(3)S.

Configlets

NPE(LEAF)	NPE(ROOT)
<pre>bridge-domain 3511 12 vfi syjhjf manual vpn id 1649 vlan 3511 exit interface GigabitEthernet7/0/11 service instance 214 ethernet description EVC-JOBID:15 encapsulation dot1q 1124 bridge-domain 3511 split-horizon interface Vlan3511 no ip address description EVC-JOBID:15 xconnect vfi syjhjf no shutdown</pre>	<pre>bridge-domain 2019 12 vfi egysd manual vpn id 5773 vlan 2019 exit interface GigabitEthernet7/0/12 service instance 633 ethernet description EVC-JOBID:16 encapsulation dot1q 2075 bridge-domain 2019 interface Vlan2019 no ip address description EVC-JOBID:16 xconnect vfi egysd no shutdown</pre>

Comments

- When the E-Tree role of the device is set as root, the Split Horizon attribute is hidden from policy and it is controlled internally using E Tree role.
- When the E-Tree role of the device is set as leaf, the Split Horizon attribute appears in the policy and prevents the communication between the spokes of different HUBs.

EVC (VPLS Core Connectivity, With E-Tree Role, Communication between the Spokes of Same HUB)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with VPLS core connectivity, with E-Tree Role, Communication between the Spokes of Same HUB.
- Device configuration:
 - Cisco 7600 with IOS Version 15.4(1)S as NPE (LEAF and ROOT).



Note

Other devices that support similar configurations are Cisco ASR9k with IOS XR 4.3.1 and Cisco ME3600 with IOS Version 15.3(3)S.

Configlets

LEAF	ROOT
<pre>12 vfi gwded manual vpn id 1028 neighbor 192.18.156.7 encapsulation mpls</pre>	<pre>12 vfi fhrerr manual vpn id 6338 neighbor 192.18.156.7 encapsulation mpls no-split-horizon</pre>

Comments

- when the E-Tree role of the device is set as root, no-split horizon attribute appears in the policy. This attribute is controlled internally using E Tree role.
- when the E-Tree role is set as leaf, split horizon attribute does not appear in the policy and it prevents the communication between spokes of the same HUB.

EVC (VPLS Core Connectivity, EFPs in same UNI, Switchport, CPT)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: Interface VLAN is not supported from CPT device. EVC-PW cannot be used in Single Home Ring scenarios as there is no support for second interface through “Interface VLAN”. As an alternative, EVC-VPLS is to be used in DHR and SHR using “L2 VFI”.
- Device configuration:
 - The N-PE is a CPT 200 platform with the version as 15.2(1)SB1, with EFPs in same UNI.
 - The U-PE is a CPT50 Ring platform with the version as 15.2(20140201:215234), with switchport (non -flex) configuration.

Configlets

U-PE	N-PE
<pre>bridge-domain 822 mode p2p exit interface GigabitEthernet1/2 no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 822 interface TenGigabitEthernet56/46 no ip address switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 822 keepalive no spanning-tree bpdfilter enable switchport nonegotiate</pre>	<pre>bridge-domain 435 mode vpls ! interface GigabitEthernet7/0/17 no shutdown service instance 2311 ethernet description EVC-JOBID:1 encapsulation dot1q 543 bridge-domain 435 service instance 2312 ethernet description EVC-JOBID:1 encapsulation dot1q 522 bridge-domain 435 ! 12 vfi vpls-100 manual vpn id 533 bridge-domain 435 neighbor 1.1.1.1 encapsulation mpls neighbor 4.4.4.4 encapsulation mpls (op- tional backup circuit)!</pre>

Comments

- UNI on N-PE.
- UPE device with switch port configuration.

EVC (VPLS Core Connectivity, EFPs in Different UNI, Service Instance, CPT)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: Interface VLAN is not supported from CPT device. EVC-PW cannot be used in Single Home Ring scenarios as there is no support for second interface through “Interface VLAN”. As an alternative, EVC-VPLS is to be used in DHR and SHR using “L2 VFI”.
- Device configuration:
 - The N-PE is a CPT 200 platform with the version as 15.2(1)SB1, with EFPs in different UNI.
 - The U-PE is a CPT50 Ring platform with the version as 15.2(20140201:215234), with service instance(flex) configuration.

Configlets

U-PE	N-PE
<pre>bridge-domain 454 mode vpls exit interface GigabitEthernet56/24 service instance 554 ethernet no description encapsulation dot1q 454 bridge-domain 454 exit interface TenGigabitEthernet56/48 service instance 554 ethernet no description encapsulation dot1q 454 bridge-domain 454 exit</pre>	<pre>bridge-domain 658 mode vpls ! interface GigabitEthernet7/0/14 service instance 1544 ethernet description EVC-JOBID:1 encapsulation dot1q 412 bridge-domain 658 ! interface GigabitEthernet7/0/19 service instance 1545 ethernet description EVC-JOBID:1 encapsulation dot1q 722 bridge-domain 658 ! l2 vfi vpls-100 manual vpn id 533 bridge-domain 435 neighbor 2.2.2.2 encapsulation mpls neighbor 3.3.3.3 encapsulation mpls (optional backup circuit) !</pre>

Comments

- UNI on N-PE.
- UPE device with service instance configuration.

EVC (VPLS Core Connectivity, With MTU Attribute Support for VPLS Services)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with VPLS core connectivity, with MTU Attribute Support. MTU attribute provides support to provision MTU value for EVC VPLS services in Direct Access Links. Earlier this attribute was available only in Links with L2 Access.
- Device configuration:
- The MTU size provided is provisioned under interface VLAN CLI for IOS Version 15.3(3)S devices and under bridge-domain CLI for IOS XR Version 4.3.1 devices.

Configlets

IOS device CLI	IOS XR device CLI
<pre>bridge-domain 2252 12 vfi DEMO_VPN_MTU-37893 manual vpn id 37893 neighbor 171.16.150.57 encapsulation mpls vlan 2252 exit interface GigabitEthernet2/2 service instance 1942 ethernet description EVC-JOBID:1 encapsulation dot1q 3321 bridge-domain 2252 exit interface Vlan2252 no ip address description EVC-JOBID:1 mtu 2500 xconnect vfi DEMO_VPN_MTU-37893 no shutdown</pre>	<pre>interface GigabitEthernet0/1/0/13.1332 l2transport description EVC-JOBID:1 encapsulation dot1q 1332 no shutdown l2vpn bridge group DEMO_CUST_MTU bridge-domain ISC-DEMO_VPN_MTU-37893 mtu 2500 interface GigabitEther- net0/1/0/13.1332 vfi DEMO_VPN_MTU-37893 neighbor 171.16.150.47 pw-id 37893</pre>

EVC (Local Connect Core Connectivity, UNI Port Security)

Configuration

- Service: EVC/Metro Ethernet.
- Feature: EVC with local connect core connectivity, with UNI port security.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s):GI2/0/0.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2. Port security is enabled.
Interface(s): FA1/14– FA3/23.

Configlets

U-PE	N-PE
<pre>vlan 788 exit ! interface FastEthernet3/23 no ip address switchport trunk allowed vlan 783,787-788 ! interface FastEthernet1/14 no cdp enable no keepalive no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan none switchport trunk allowed vlan 788 switchport port-security switchport nonegotiate switchport port-security maximum 45 switchport port-security aging time 34 switchport port-security violation shutdown switchport port-security mac-address 4111.4545.1211 spanning-tree bpdupfilter enable mac access-group ISC-FastEthernet3/23 in ! mac access-list extended ISC-FastEthernet3/31 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 deny any host 1234.3234.3432 permit any any</pre>	<pre>Connect Customer_1 GigabitEthernet4/0/1 10 GigabitEthernet4/0/10 25 interface GigabitEtherne4/0/1 no shut service instance 10 ethernet encapsulation dot1q 500 rewrite ingress tag push dot1q 555 symmetric interface GigabitEtherne4/0/10 no shut service instance 25 ethernet encapsulation dot1q 500 second-dot1q 501 rewrite ingress tag translate 2-to-1 dot1q 222 symmetric</pre>

Comments

- UNI on U-PE.
- Two tag matching operations are carried out.
- The rewrite operation translates two tags to a single tag.
- Two service instances are connected through the **connect** command.

EVC (Local Connect Core Connectivity, UNI, no Port Security, Bridge Domain)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with local connect core connectivity, with UNI, without port security, and with bridge domain.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s):GI2/0/0.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2.
Interface(s):FA1/14– FA3/23.

Configlets

U-PE	N-PE
<pre>vlan 772 exit ! interface FastEthernet3/23 switchport trunk allowed vlan 500,772 ! interface FastEthernet1/14 no cdp enable no keepalive no ip address switchport trunk allowed vlan 500,772 spanning-tree bpdudfilter enable mac access-group ISC-FastEthernet3/23 in ! mac access-list extended ISC-FastEthernet1/14 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 permit any any</pre>	<pre>interface GigabitEtherne2/0/0 no shut service instance 10 ethernet encapsulation dot1q 500 second-dot1q 501 rewrite ingress tag translate 2-to-2 dot1q 222 second-dot1q 41 symmetric bridge-domain 200 split-horizon interface GigabitEtherne2/0/10 no shut service instance 15 ethernet encapsulation dot1q 24 rewrite ingress tag pop 1 symmetric bridge-domain 200 split-horizon</pre>

Comments

- UNI on U-PE.
- The rewrite operation maps/translates the incoming two tags into two different tags.
- The service instances here are connected through bridge domain.

EVC (Pseudowire Core Connectivity, Bridge Domain, Pseudowire on SVI)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with pseudowire core connectivity, with bridge domain, and with Pseudowire on SVI enabled on the N-PE.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GigabitEthernet7/0/0.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2.
Interface(s): FastEthernet1/0/10.

Configlets

U-PE	N-PE
<pre>vlan 452 exit ! interface FastEthernet1/0/10 no ip address switchport trunk allowed vlan add 452 ! interface FastEthernet1/0/13 no spanning-tree bpdupfilter enable switchport no keepalive no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 452 switchport nonegotiate</pre>	<pre>vlan 3524 exit ! ethernet evc Customer1_253 ! interface GigabitEthernet7/0/0 service instance 3 ethernet Customer1_253 encapsulation dot1q 452 rewrite ingress tag pop 1 symmetric bridge-domain 3524 split-horizon ! interface Vlan3524 no ip address description BD=T,SVI=T,Flex xconnect 22.22.22.22 52500 encapsulation mpls backup peer 22.22.22.22 52501 no shutdown</pre>

Comments

- None.

EVC (Pseudowire Core Connectivity, no Bridge Domain, no Pseudowire on SVI)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with pseudowire core connectivity, bridge domain disables, and with Pseudowire on SVI disabled on the N-PE.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GigabitEthernet7/0/0.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2.
Interface(s): FastEthernet1/0/10.

Configlets

U-PE	N-PE
<pre>vlan 545 exit ! interface FastEthernet1/0/10 no ip address switchport trunk allowed vlan add 545 ! interface FastEthernet1/0/12 no spanning-tree bpdupfilter enable switchport no keepalive no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 545 switchport nonegotiate mac access-group ISC-FastEthernet1/0/12 in</pre>	<pre>ethernet evc Customer1_248 ! interface GigabitEthernet7/0/0 service instance 2 ethernet Customer1_248 encapsulation dot1q 545 rewrite ingress tag pop 1 symmetric xconnect 22.22.22.22 52498 encapsulation mpls backup peer 22.22.22.22 52499</pre>

Comments

- None.

EVC (AutoPick Service Instance Name)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with AutoPick Service Instance Name enabled and the Service Instance Name input field left blank.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GigabitEthernet7/0/2.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2.
Interface(s): FastEthernet1/0/14.

Configlets

U-PE	N-PE
<pre>! vlan 452 exit ! interface FastEthernet1/0/10 no ip address switchport trunk allowed vlan add 452 ! interface FastEthernet1/0/13 no spanning-tree bpdufilter enable switchport no keepalive no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 452 switchport nonegotiate mac access-group ISC-FastEthernet1/0/13 in</pre>	<pre>! vlan 3524 exit ! ethernet evc C1_1 ! interface GigabitEthernet7/0/0 service instance 3 ethernet C1_1 encapsulation dot1q 452 rewrite ingress tag pop 1 symmetric bridge-domain 3524 split-horizon ! interface Vlan3524 no ip address description BD=T,SVI=T,Flex xconnect 22.22.22.22 52500 encapsulation mpls backup peer 22.22.22.22 52501 no shutdown</pre>

Comments

- The transport type is pseudowire.
- The autopick Service Instance Name will take the value *CustomerName_JobID*.

EVC (No AutoPick Service Instance Name, No Service Instance Name)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with AutoPick Service Instance Name not enabled and the Service Instance Name input field left blank.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GigabitEthernet7/0/2.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2.
Interface(s): FastEthernet1/0/14.

Configlets

U-PE	N-PE
<pre> ! vlan 566 exit ! interface FastEthernet1/0/14 no spanning-tree bpdufilter enable switchport no keepalive no ip address switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 566 switchport nonegotiate no shutdown mac access-group ISC-FastEthernet1/0/14 in ! interface FastEthernet1/0/18 no ip address switchport trunk allowed vlan 566 ! mac access-list extended ISC-FastEthernet1/0/14 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 permit any any </pre>	<pre> ! interface GigabitEthernet7/0/2 service instance 43 ethernet encapsulation dot1q 566 xconnect 1.1.1.1 453366 encapsulation mpls </pre>

Comments

- In this example, the user does not enable AutoPick Service Instance Name and also leaves the Service Instance Name input field blank.
- The global command **ethernet evc** is not generated, while the command **service instance 43 ethernet** is generated.
- There is no Service Instance Name available and the Service Instance ID is 43.

EVC (Pseudowire Core Connectivity, User-Provided Service Instance Name)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with pseudowire core connectivity and user-provided service instance name.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GigabitEthernet7/0/0.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2.
Interface(s): FastEthernet1/0/10.

Configlets

U-PE	N-PE
<pre>! vlan 452 exit ! interface FastEthernet1/0/10 no ip address switchport trunk allowed vlan add 452 ! interface FastEthernet1/0/13 no spanning-tree bpdfilter enable switchport no keepalive no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 452 switchport nonegotiate mac access-group ISC-FastEthernet1/0/13 in</pre>	<pre>! vlan 3524 exit ! ethernet evc ServiceInst ! interface GigabitEthernet7/0/0 service instance 3 ethernet ServiceInst encapsulation dot1q 452 rewrite ingress tag pop 1 symmetric bridge-domain 3524 split-horizon ! interface Vlan3524 no ip address description BD=T,SVI=T,Flex xconnect 22.22.22.22 52500 encapsulation mpls backup peer 22.22.22.22 52501 no shutdown</pre>

Comments

- The transport type is PSEUDOWIRE.
- The user manually provided **ServiceInst** as the Service Instance Name. This is pushed onto the device, where the Service Instance ID is 3.

EVC (Pseudowire Core Connectivity, Pseudowire Redundancy, “A” – “Z”)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with Pseudowire core connectivity, pseudowire redundancy (“A” – “Z”) with backup peer command on both ends.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS version 12.2(33).
Interface(s): GigabitEthernet7/0/13.
 - The N-PE 2 is a Cisco 7600 with IOS version 12.2(33).
Interface(s): GigabitEthernet3/2.

Configlets

N-PE 1 (“A” End)	N-PE 2 (“Z” End)
<pre>pseudowire-class PrimeF-pwc-Vpn1-staticLabels encapsulation mpls protocol none interface GigabitEthernet7/0/13 service instance 6560 ethernet description EVC-JOBID:22 encapsulation dot1q 4018 xconnect 10.10.10.10 451341 encapsulation mpls manual pw-class PrimeF-pwc-Vpn1-staticLabels mpls label 16 5001 backup peer 10.10.10.10 333612 mpls label 18 8001</pre>	<pre>pseudowire-class PrimeF-pwc-Vpn1-staticLabels protocol none interface GigabitEthernet3/2 no shutdown service instance 5551 ethernet description EVC-JOBID:22 encapsulation dot1q 2551 xconnect 1.1.1.1 451341 encapsulation mpls manual pw-class PrimeF-pwc-Vpn1-staticLabels mpls label 5001 16 backup peer 1.1.1.1 333612 mpls label 8001 18</pre>

Comments

- None.

EVC (Pseudowire Core Connectivity, Pseudowire Redundancy, “A”, “Z”, and “Z ”)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with Pseudowire core connectivity, pseudowire redundancy (“A”, “Z”, and “Z ”) with backup peer command on “A” end only.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS version 12.2(33).
Interface(s): GigabitEthernet7/0/13.
 - The N-PE 2 is a Cisco 7600 with IOS version 12.2(33).
Interface(s): GigabitEthernet7/0/18.
 - The N-PE 3 is a Cisco 7600 with IOS version 12.2(33).
Interface(s): GigabitEthernet3/2.

Configlets

N-PE 1 (“A” End)	N-PE 2 (“Z” End)
<pre>pseudowire-class PrimeF-pwc-Vpn1-staticLabels encapsulation mpls protocol none interface GigabitEthernet7/0/13 service instance 6560 ethernet description EVC-JOBID:22 encapsulation dot1q 4018 xconnect 10.10.10.10 451341 encapsulation mpls manual pw-class PrimeF-pwc-Vpn1-staticLabels mpls label 16 5001 backup peer 6.6.7.1 333612 mpls label 18 8001</pre>	<pre>pseudowire-class PrimeF-pwc-Vpn1-staticLabels encapsulation mpls protocol none interface GigabitEthernet7/0/18 service instance 7580 ethernet description EVC-JOBID:22 encapsulation dot1q 3486 xconnect 1.1.1.1 451341 encapsulation mpls manual pw-class PrimeF-pwc-Vpn1-staticLabels mpls label 5001 16</pre>
N-PE 3 (“Z ” End)	
<pre>pseudowire-class PrimeF-pwc-Vpn1-staticLabels protocol none interface GigabitEthernet3/2 no shutdown service instance 5551 ethernet description EVC-JOBID:22 encapsulation dot1q 2551 xconnect 1.1.1.1 333612 encapsulation mpls manual pw-class PrimeF-pwc-Vpn1-staticLabels mpls label 8001 18</pre>	

Comments

- None.

EVC (Pseudowire Core Connectivity, Pseudowire Redundancy, “A”, “Z”, and “Z ’”, where “Z ’” = “Z ’”)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with Pseudowire core connectivity, pseudowire redundancy, with backup peer on “A” only, “Z” and “Z ’” (prime) are the same device but two service instances created on separate interfaces.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS version 12.2(33).
Interface(s): GigabitEthernet7/0/11.
 - The N-PE 2 is a Cisco 7600 with IOS version 12.2(33).
Interface(s): GigabitEthernet7/0/16, GigabitEthernet7/0/17.

Configlets

N-PE 1 (“A” End)	N-PE 2 (“Z” End)
<pre>interface GigabitEthernet7/0/11 service instance 4775 ethernet description EVC-JOBID:23 encapsulation dot1q 1985 xconnect 10.10.10.10 125412 encapsulation mpls manual pw-class PrimeF-pwc-Vpn1-staticLabels mpls label 16 5001 backup peer 10.10.10.10 333212 mpls label 18 5002</pre>	<pre>interface GigabitEthernet7/0/16 service instance 6987 ethernet description EVC-JOBID:23 encapsulation dot1q 2987 xconnect 1.1.1.1 125412 encapsulation mpls manual pw-class PrimeF-pwc-Vpn1-staticLabels mpls label 5001 16 interface GigabitEthernet7/0/17 service instance 6665 ethernet description EVC-JOBID:23 encapsulation dot1q 2665 xconnect 1.1.1.1 333212 encapsulation mpls manual pw-class PrimeF-pwc-Vpn1-staticLabels mpls label 5002 18</pre>

Comments

- None.

EVC (Pseudowire Core Connectivity, Service Instance Syntax on L2 Access Nodes)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with Pseudowire core connectivity, service instance syntax on L2 access node, EVC UNI enabled, configured with Bridge Domain disabled.
- Device configuration:
 - The U-PE is a Cisco 7600 with IOS version 15.2(4)S.
Interface(s): GigabitEthernet5/15, GigabitEthernet5/16.
 - The PE-AGG is a Cisco ASR903 with IOS version 15.2(4)S1a
Interface(s): GigabitEthernet0/5, GigabitEthernet0/6.
 - The N-PE is a Cisco 7600 with IOS version 15.2(4)S.
Interface(s): GigabitEthernet2/0/15.

Configlets

U-PE	PE-AGG
<pre>bridge-domain 3600 exit vlan 3600 exit interface GigabitEthernet5/15 service instance 2321 ethernet encapsulation dot1q 3600 bridge-domain 3600 exit interface GigabitEthernet5/16 service instance 2321 ethernet encapsulation dot1q 3600 bridge-domain 3600 exit</pre>	<pre>bridge-domain 3600 exit interface GigabitEthernet0/5 service instance 400 ethernet encapsulation dot1q 3600 rewrite ingress tag pop 1 symmetric bridge-domain 3600 exit interface GigabitEthernet0/6 service instance 400 ethernet encapsulation dot1q 3600 rewrite ingress tag pop 1 symmetric bridge-domain 3600 exit</pre>
N-PE	
<pre>interface GigabitEthernet2/0/15 service instance 3700 ethernet description EVC-JOBID:6 encapsulation dot1q 3600 xconnect 171.16.150.56 45000 encapsulation mpls</pre>	

Comments

- The bridge domain VLAN input for the U-PE and PE-AGG will be reused from the outer VLAN (if push is not enabled at the UNI).

EVC (Pseudowire Core Connectivity, Mixture of Switchport and Service Instance Syntax on L2 Access Nodes, Push Outer Enabled)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with Pseudowire core connectivity, mixture of switchport and service instance syntax on L2 access nodes, EVC UNI enabled, push outer enabled, configured with bridge domain disabled.
- Device configuration:
 - The U-PE is a Cisco ME3600 with IOS Version 15.3(1)S.
Interface(s): GigabitEthernet5/15, GigabitEthernet5/16.
 - The PE-AGG is a Cisco 7600 with IOS version 15.2(4)S
Interface(s): GigabitEthernet0/5, GigabitEthernet0/6.
 - The N-PE is a Cisco 7600 with IOS version 15.2(4)S.
Interface(s): GigabitEthernet2/0/15.

Configlets

U-PE	PE-AGG
<pre> bridge-domain 3600 exit vlan 3600 exit interface GigabitEthernet5/15 switchport trunk allowed vlan none switchport mode trunk service instance 2321 ethernet encapsulation dot1q 1500 rewrite ingress tag push dot1q 3600 symmetric bridge-domain 3600 exit interface GigabitEthernet5/16 switchport trunk allowed vlan none switchport mode trunk service instance 2321 ethernet encapsulation dot1q 3600 bridge-domain 3600 exit </pre>	<pre> bridge-domain 3600 exit vlan 3600 exit interface GigabitEthernet0/5 switchport trunk allowed vlan add 3600 exit interface GigabitEthernet0/6 service instance 400 ethernet encapsulation dot1q 3600 rewrite ingress tag pop 1 symmetric bridge-domain 3600 exit </pre>

N-PE

```

interface GigabitEthernet2/0/15
  service instance 3700 ethernet
    description EVC-JOBID:6
    encapsulation dot1q 3600 second-dot1q
1500
  xconnect 171.16.150.56 45000
  encapsulation mpls
                    
```

Comments

- In case push outer is enabled at the UNI, the same will be matched at the up-link of the U-PE, PE-AGG, and N-PE interfaces
- In the PE-AGG device, GigabitEthernet0/5 is a non-EVC interface. Hence, switchport gets provisioned into the interface. This is identified automatically during provisioning.

EVC (Pseudowire Core Connectivity, Service Instance Syntax on L2 Access Nodes, Push Both Enabled)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with Pseudowire core connectivity, service instance syntax on L2 access nodes, EVC UNI enabled, encapsulation untagged, Push Both enabled, configured with bridge domain disabled.
- Device configuration:
 - The U-PE is a Cisco 7600 with IOS version 15.2(4)S.
Interface(s): GigabitEthernet5/15, GigabitEthernet5/16.
 - The PE-AGG is a Cisco ASR901 with IOS Version 15.2(2)SNH1
Interface(s): GigabitEthernet0/5, GigabitEthernet0/6.
 - The N-PE is a Cisco 7600 with IOS version 15.2(4)S
Interface(s): GigabitEthernet2/0/15.

Configlets

U-PE	PE-AGG
<pre>bridge-domain 3600 exit vlan 3600 exit interface GigabitEthernet5/15 service instance 2321 ethernet encapsulation untagged rewrite ingress tag push dot1q 3600 second-dot1q 3700 symmetric bridge-domain 3600 exit interface GigabitEthernet5/16 service instance 2321 ethernet encapsulation dot1q 3600 bridge-domain 3600 exit</pre>	<pre>bridge-domain 3600 exit interface GigabitEthernet0/5 service instance 400 ethernet encapsulation dot1q 3600 rewrite ingress tag pop 1 symmetric bridge-domain 3600 exit interface GigabitEthernet0/6 service instance 400 ethernet encapsulation dot1q 3600 rewrite ingress tag pop 1 symmetric bridge-domain 3600 exit</pre>

N-PE

```
interface GigabitEthernet2/0/15
  service instance 3700 ethernet
  description EVC-JOBID:6
  encapsulation dot1q 3600 second-dot1q
3700
  xconnect 171.16.150.56 45000
encapsulation mpls
```

Comments

- In case push both is enabled at the UNI (which is applicable for encapsulation UNTAGGED), only the outer VLAN will be matched at the U-PE up-link and PE-AGG interfaces, whereas both outer and inner VLAN will be matched at the N-PE.

EVC (Pseudowire Core Connectivity, Static Pseudowire, IOS Device)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with Pseudowire core connectivity, IOS device, static pseudowire (all static), configured with bridge domain disabled.
- Device configuration:
 - N-PE 1 is a Cisco 7600 with IOS Version 15.2(4)S.
Interface(s): GigabitEthernet7/0/17.
 - N-PE 2 is a Cisco ASR9K with IOS-XR Version 4.2.2.
Interface(s): GigabitEthernet0/1/0/25.

Configlets

N-PE 1	N-PE 2
<pre>interface GigabitEthernet7/0/17 service instance 3801 ethernet description EVC-JOBID:66 encapsulation dot1q 3801 xconnect 192.168.101.1 5466 encapsulation mpls manual mpls label 21 4018</pre>	<pre>interface GigabitEthernet0/1/0/25.3801 l2transport encapsulation dot1q 3801 no shutdown l2vpn xconnect group ISC p2p isc-cl-test-l2-asr9006-1--5466 interface GigabitEthernet0/1/0/25.3801 neighbor 1.1.1.1 pw-id 5466 mpls static label local 4018 remote 21</pre>

Comments

- None.

EVC (Pseudowire Core Connectivity, Static Pseudowire, IOS Device, Pseudowire Redundancy)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with pseudowire core connectivity, IOS device, static pseudowire (all static), configured with bridge domain enabled, pseudowire redundancy, pseudowire class disabled.
- Device configuration:
 - N-PE 1 is a Cisco 7600 with IOS Version 15.2(4)S.
Interface(s): GigabitEthernet4/0/14.
 - N-PE 2 is a Cisco 7600 with IOS Version 15.2(4)S.
Interface(s): GigabitEthernet2/0/19.

Configlets

N-PE 1	N-PE 2
<pre>bridge-domain 367 exit vlan 367 exit interface GigabitEthernet4/0/14 service instance 697 ethernet description EVC-JOBID:9 encapsulation dot1q 147 bridge-domain 367 interface Vlan367 no ip address description EVC-JOBID:9 xconnect 192.169.105.20 6589632 encapsulation mpls manual mpls label 8003 2102 backup peer 192.169.105.20 47851 mpls label 8004 2103 no shutdown</pre>	<pre>bridge-domain 23 exit vlan 23 exit interface GigabitEthernet2/0/19 service instance 398 ethernet description EVC-JOBID:9 encapsulation dot1q 434 bridge-domain 23 interface Vlan23 no ip address description EVC-JOBID:9 xconnect 192.169.105.10 6589632 encapsulation mpls manual mpls label 2102 8003 backup peer 192.169.105.10 47851 mpls label 2103 8004 no shutdown</pre>

Comments

- None.

EVC (Pseudowire Core Connectivity, Static Pseudowire, IOS Device, Bridge Domain Disabled)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with Pseudowire core connectivity, static pseudowire (all static), IOS device, configured with bridge domain disabled, pseudowire class enabled.
- Device configuration:
 - N-PE 1 is a Cisco 7600 with IOS Version 15.2(4)S.
Interface(s): GigabitEthernet4/0/14.
 - N-PE 2 is a Cisco ASR9K with IOS-XR Version 4.2.2.
Interface(s): GigabitEthernet0/1/0/25.

Configlets

N-PE 1	N-PE 2
<pre>pseudowire-class d-staticpw encapsulation mpls protocol none interface GigabitEthernet7/0/17 service instance 3801 ethernet description EVC-JOBID:66 encapsulation dot1q 3801 xconnect 192.168.101.1 5466 encapsulation mpls manual pw-class d-staticpw mpls label 21 4018</pre>	<pre>interface GigabitEthernet0/1/0/25.3801 l2transport encapsulation dot1q 3801 no shutdown l2vpn pw-class d-staticpw encapsulation mpls xconnect group ISC p2p isc-cl-test-l2-asr9006-1--5466 interface GigabitEthernet0/1/0/25.3801 neighbor 1.1.1.1 pw-id 5466 mpls static label local 4018 remote 21 pw-class d-staticpw</pre>

Comments

- None.

EVC (Pseudowire Core Connectivity, Pseudowire Service with BVI)

Configuration

- EVC/Metro Ethernet.
 - Feature: EVC with Pseudowire core connectivity, configured with bridge domain enabled, use BVI enabled.
 - Device configuration:
 - The N-PE is a Cisco ASR9K with IOS XR Version 4.2.2.
- Interface(s): GigabitEthernet0/1/0/0.

Configlets

N-PE

```
l2vpn
bridge group cisco
bridge-domain domain50
  Interface GigabitEthernet0/1/0/0.50
  routed interface bvi 20
  neighbor 1.2.3.4 pw-id 55
```

Comments

- As a prerequisite, an interface BVI should be created for the L3VPN service and a config-collect task should be performed for this ASR9K device.
- This feature is only applicable for ASR9K devices.

EVC (Pseudowire Core Connectivity, Static Pseudowire, OAM Class Set in DCPL Property)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with Pseudowire core connectivity, EVC N-PE enabled, pseudowire class enabled, OAM class set in DCPL property.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS Version 15.2(4)S.
 - Interface(s): TenGigabitEthernet2/1.

Configlets

```

N-PE
-----
pseudowire-class d-static-oam-1
  encapsulation mpls
  protocol none
  status protocol notification static
d-static-oam-1
interface TenGigabitEthernet2/1
  service instance 456 ethernet
  description EVC-JOBID:4
  encapsulation dot1q 765
  xconnect 1w-class92.16.5.58 6544
encapsulation mpls manual p d-static-oam-1
  mpls label 4001 32
  
```

Comments

- EVC static pseudowire can also be provisioned with OAM class enabled. The prerequisite for this is that the OAM class needs to be created manually by the user, and the same should be provided as DCPL property “Provisioning\Service\fsm\SetStaticOamClassName” in Prime Provisioning.
- This is only applicable for IOS platforms.

EVC (Local Core Connectivity, User-Provided Service Instance Name)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with local core connectivity and a user-provided service instance name.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GigabitEthernet1/0/6, GigabitEthernet1/0/7.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2.
Interface(s): FastEthernet1/0/12, FastEthernet1/0/14.

Configlets

U-PE	N-PE
<pre> vlan 45 exit ! interface FastEthernet1/0/12 no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 45 ! interface FastEthernet1/0/14 no spanning-tree bpdufilter enable switchport no keepalive no ip address switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 45 switchport nonegotiate no shutdown mac access-group ISC-FastEthernet1/0/14 in ! mac access-list extended ISC-FastEthernet1/0/14 deny any host 0100.0ccc.cccc deny any host 0100.0ccc.cccd deny any host 0100.0ccd.cdd0 deny any host 0180.c200.0000 permit any any </pre>	<pre> ethernet evc service_int ! interface GigabitEthernet1/0/6 no shutdown service instance 5 ethernet service_int encapsulation dot1q 56 ! interface GigabitEthernet1/0/7 no shutdown service instance 33 ethernet service_int encapsulation dot1q 45 ! connect Customer2_195 GigabitEthernet1/0/7 33 GigabitEthernet1/0/6 5 </pre>

Comments

- The transport type is LOCAL.
- The user manually provided **service_int** as the Service Instance Name. This is pushed onto the device, where the Service Instance IDs are 5 and 33, respectively.

EVC (VPLS Core Connectivity, User-Provided Service Instance Name)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC with VPLS core connectivity and user-provided service instance name.
- Device configuration:
 - The N-PE is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GigabitEthernet7/0/0.
 - The U-PE is a Cisco 3750ME with IOS 12.2(25) EY2.
Interface(s): FastEthernet1/0/10.

Configlets

U-PE	N-PE
<pre>! vlan 452 exit ! interface FastEthernet1/0/10 no ip address switchport trunk allowed vlan add 452 ! interface FastEthernet1/0/13 no spanning-tree bpdupfilter enable switchport no keepalive no ip address switchport switchport trunk encapsulation dot1q switchport mode trunk switchport trunk allowed vlan 452 switchport nonegotiate mac access-group ISC-FastEthernet1/0/13 in</pre>	<pre>l2 vfi vpls-test manual vpn id 300 neighbor 22.22.22.22 encapsulation mpls ! vlan 500 ! ethernet evc ServiceInst ! interface GigabitEtherne7/0/0 service instance 10 ethernet ServiceInst encapsulation dot1q 400 rewrite ingress tag pop 1 symmetric bridge-domain 500 split-horizon ! interface vlan500 xconnect vfi vpls-test</pre>

Comments

- The transport type is VPLS.
- The user manually provided **ServiceInst** as the Service Instance Name. This is pushed onto the device, where the Service Instance ID is 10.

EVC (ATM-Ethernet Interworking, Pseudowire Core Connectivity, Point-to-Point Circuit)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with pseudowire core connectivity with an end-to-end circuit with multiple links. One link terminates on an ATM interface on N-PE 1, and the other link terminates on an Ethernet interface on N-PE 2.
- Device configuration:
 - N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): ATM1/0/0.370.
 - N-PE 2 is a Cisco 7600 with IOS 12.2(33) SRE.
Interface(s): GigabitEthernet4/0/2.

Configlets

N-PE 1 (ATM)	N-PE 2 (Ethernet)
<pre>! interface ATM1/0/0.370 point-to-point no atm enable-ilmi-trap pvc 0/370 l2transport encapsulation aal5snap xconnect 192.169.105.10 123 pw-class inter-ether !</pre>	<pre>! ethernet evc 1-3_51 ! interface GigabitEthernet4/0/2 no ip address no mls qos trust service instance 103 ethernet 1-3_51 encapsulation dot1q 370 rewrite ingress tag pop 1 symmetric xconnect 192.169.105.20 123 encapsulation mpls !</pre>

Comments

- None.

EVC (ATM-Ethernet Interworking, Pseudowire Core Connectivity, Multipoint Circuit)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with pseudowire core connectivity with a multipoint circuit. Link #1 terminates on an ATM interface on N-PE 1, link #2 terminates on an Ethernet interface on N-PE 1, and link #3 terminates on an Ethernet interface on N-PE 2.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GigabitEthernet7/0/4, ATM6/0/0.100.
 - The N-PE 2 is a Cisco 7600 with IOS 12.2(33) SRE.
Interface(s): GigabitEthernet7/0/5.

Configlets

N-PE 1 (ATM + Ethernet)	N-PE 2 (Ethernet)
<pre>! vlan 500 exit ! ethernet evc Customer1_166 ! interface GigabitEthernet7/0/4 no shutdown service instance 1 ethernet Customer1_166 encapsulation dot1q 600 bridge-domain 500 split-horizon ! interface ATM6/0/0.100 point-to-point pvc 200/300 encapsulation aal5snap bridge-domain 500 split-horizon ! interface Vlan500 no ip address description UT-9 xconnect 1.1.1.1 6 pw-class ISC-pw-tunnel-400 no shutdown</pre>	<pre>! vlan 800 exit ! ethernet evc Customer1_166 ! interface GigabitEthernet7/0/5 no shutdown service instance 1 ethernet Customer1_166 encapsulation dot1q 623 bridge-domain 800 split-horizon ! interface Vlan800 description UT-9 xconnect 192.169.105.20 6 pw-class ISC-pw-tunnel-900</pre>

Comments

- None.

EVC (ATM-Ethernet Interworking, Pseudowire Core Connectivity, Pseudowire Redundancy)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with pseudowire core connectivity, with Pseudowire Redundancy. Pseudowire Redundancy support has been extended to ATM-Ethernet Interworking service type for both IOS and IOS-XR devices.
- Device configuration:
 - The A-END is an ATM LINK with IOS XR Version 4.3.1 devices.
Interface(s): ATM0/3/0/0.789, l2transport pvc 78/89
 - The Z-END is an ETHERNET LINK with IOS XR Version 4.3.1 devices.
Interface(s): GigabitEthernet0/1/0/12.809 l2transport.
 - The Z Backup - END is an ETHERNET LINK with IOS Version 15.3(3)S devices.
Interface(s): GigabitEthernet7/0/15 service instance 567 Ethernet.

Configlets

ATM LINK (IOS XR DEVICE): A - END	ETHERNET LINK (IOS-XR DEVICE): Z - END
<pre>interface ATM0/3/0/0.789 l2transport pvc 78/89 encapsulation aal5snap no shutdown l2vpn xconnect group ISC p2p D-ELINE-DEMO interface ATM0/3/0/0.789 neighbor ipv4 192.168.12.21 pw-id 6898 backup neighbor 10.10.10.10 pw-id 6899</pre>	<pre>interface GigabitEthernet0/1/0/12.809 l2transport description EVC-JOBID:15 encapsulation dot1q 809 rewrite ingress tag pop 1 symmetric no shutdown l2vpn xconnect group ISC p2p D-ELINE-DEMO interface GigabitEthernet0/1/0/12.809 neighbor ipv4 192.168.80.210 pw-id 6898</pre>

ETHERNET LINK (IOS DEVICE): Z Backup - END

```
interface GigabitEthernet7/0/15
  service instance 567 ethernet
  description EVC-JOBID:15
  encapsulation dot1q 567
  rewrite ingress tag pop 1 symmetric
xconnect 192.168.80.210 6899 encapsulation
mpls
```

Comments

- None.

EVC (ATM-Ethernet Interworking, Local Core Connectivity, Point-to-Point Circuit)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with local core connectivity with a point-to-point circuit. The circuit terminates on different ATM interfaces on the same local N-PE.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
 - Interface(s): ATM1/0/1, ATM4/1/0, ATM1/0/1.99, ATM4/1/0.98.

Configlets

N-PE 1 (ATM)	N/A
<pre> ! interface ATM1/0/1 no shutdown ! interface ATM4/1/0 no shutdown ! interface ATM1/0/1.99 point-to-point pvc 99/99 l2transport encapsulation aal0 ! interface ATM4/1/0.98 point-to-point pvc 98/98 l2transport encapsulation aal0 ! connect ATM-to-ATM ATM1/0/1 99/99 ATM4/1/0 98/98 ! </pre>	

Comments

- None.

EVC (ATM-Ethernet Interworking, Local Core Connectivity, Multipoint Circuit)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with local core connectivity for multiple links that terminate on the same local N-PE. Link #1 terminates on an ATM interface, and link #2 terminates on an Ethernet interface.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
 - Interface(s): ATM1/0/0.99, TenGigabitEthernet6/0/0, TenGigabitEthernet6/0/1.

Configlets

N-PE 1 (ATM + Ethernet)	N/A
<pre> ! vlan 1001 exit ! interface ATM1/0/0.99 point-to-point no atm enable-ilmi-trap pvc 99/99 encapsulation aal5snap bridge-domain 1001 ! ! interface TenGigabitEthernet6/0/0 no ip address no mls qos trust service instance 104 ethernet 1-4_60 encapsulation dot1q 11 rewrite ingress tag pop 1 symmetric bridge-domain 1001 ! ! interface TenGigabitEthernet6/0/1 no ip address no mls qos trust service instance 105 ethernet 1-4_60 encapsulation dot1q 12 rewrite ingress tag pop 1 symmetric bridge-domain 1001 ! </pre>	

Comments

- None.

EVC (ATM-Ethernet Interworking, Local Core Connectivity, Multipoint Circuit)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with local core connectivity. Multiple links terminate on the same local N-PE. Link #1 terminates on an ATM interface, link #2 terminates on an ATM interface, and link #3 terminates on an ATM interface.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
 - Interface(s): ATM6/0/0.100, ATM6/0/1.101, ATM6/0/2.102.

Configlets

N-PE 1 (ATM)	N/A
<pre> ! vlan 500 exit ! interface ATM6/0/0.100 point-to-point pvc 200/300 encapsulation aal5snap bridge-domain 500 ! interface ATM6/0/1.101 point-to-point pvc 201/301 encapsulation aal5snap bridge-domain 500 ! interface ATM6/0/2.102 point-to-point pvc 202/302 encapsulation aal5snap bridge-domain 500 ! </pre>	

Comments

- None.

EVC (ATM-Ethernet Interworking, Local Core Connectivity, Point-to-Point Circuit)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with local core connectivity. A point-to-point circuit terminates on different ATM interfaces on same local N-PE.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
 - Interface(s): ATM1/0/0, ATM1/0/1.

Configlets

N-PE 1 (ATM)	N/A
<pre>! interface ATM1/0/0 atm pvp 33 l2transport ! interface ATM1/0/1 atm pvp 222 l2transport ! connect Customer1_208 ATM1/0/0 33 ATM1/0/1 222</pre>	

Comments

- None.

EVC (ATM-Ethernet Interworking, Pseudowire Core Connectivity, End-to-End Circuit)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with pseudowire core connectivity for end-to-end circuit with multiple links. One link terminates on ATM interface on N-PE 1, and other link terminates on an Ethernet interface on N-PE 2.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): ATM1/0/0.370.
 - The N-PE 2 is a Cisco ASR 9000 with IOS XR 3.9.0.
Interface(s): GigabitEthernet0/0/0/4.458.

Configlets

N-PE 1 (ATM)	N-PE 2 (Ethernet)
<pre>! interface ATM1/0/0.370 point-to-point no atm enable-ilmi-trap pvc 0/370 l2transport encapsulation aal5snap xconnect 192.169.105.10 123 pw-class inter-ether !</pre>	<pre>interface GigabitEthernet0/0/0/4.458 l2transport encapsulation dot1q 458 ! l2vpn xconnect group VPNSC p2p iscind-crs-1--48856 interface GigabitEthernet0/0/0/4.458 neighbor 192.168.118.167 pw-id 123 ! ! !</pre>

Comments

- None.

EVC (ATM-Ethernet Interworking, Pseudowire Core Connectivity, Multipoint Circuit)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with pseudowire core connectivity with an end-to-end circuit with multiple links. One link is terminating on an ATM interface on N-PE 1, and the other (non-flex) link terminates on an Ethernet interface on N-PE 2.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): ATM4/1/0.8790.
 - The N-PE 2 is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): GigabitEthernet4/0/17.600.

Configlets

N-PE 1 (ATM)	N-PE 2 (Ethernet)
<pre>interface ATM4/1/0.8790 point-to-point pvc 150/3454 l2transport encapsulation aal5snap xconnect 192.169.105.10 760 pw-class ISC-pw-tunnel-1</pre>	<pre>interface GigabitEthernet4/0/17.600 encapsulation dot1Q 600 xconnect 192.169.105.20 760 pw-class ISC-pw-tunnel-1</pre>

Comments

- None.

EVC (ATM-Ethernet Interworking, Local Core Connectivity, Point-to-Point Circuit)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with local core connectivity for point-to-point circuit. The circuit terminates on the same, local N-PE 1. One link terminates on an ATM interface, and the other (non-flex) link terminates on an Ethernet interface.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): ATM1/0/0.444.
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): FastEthernet3/39.674.

Configlets

N-PE 1 (ATM + Ethernet)	N/A
<pre>! interface FastEthernet3/39.674 encapsulation dot1Q 674 ! interface ATM1/0/0.444 point-to-point pvc 44/4444 l2transport encapsulation aal5snap ! connect Customer1_204 ATM1/0/0 44/4444 FastEthernet3/39.674 interworking ethernet</pre>	

Comments

- None.

EVC (ATM-Ethernet Interworking, Pseudowire Core Connectivity, End-to-End Circuit, with Bridge Domain)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with pseudowire core connectivity for end-to-end circuit with multiple links with bridge domain enabled. One link terminates on an ATM interface on N-PE 1, and the other link terminates on a flex Ethernet interface on N-PE 2.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): ATM1/0/0.370.
 - The N-PE 2 is a Cisco ASR 9000 with IOS XR 3.9.0.
Interface(s): GigabitEthernet0/0/0/25.341.

Configlets

N-PE 1 (ATM)	N-PE 2 (Ethernet)
<pre>! interface ATM1/0/0.370 point-to-point no atm enable-ilmi-trap pvc 0/370 l2transport encapsulation aal5snap xconnect 10.20.21.1 4531 pw-class ISC-pw-tunnel-1</pre>	<pre>interface GigabitEthernet0/0/0/25.341 l2transport encapsulation dot1q 341 rewrite ingress tag push dot1q 430 second-dot1q 349 symmetric ! l2vpn bridge group tml bridge-domain CISCO interface GigabitEthernet0/0/0/25.341 ! neighbor 192.169.105.20 pw-id 32190 ! ! !</pre>

Comments

- None.

EVC (ATM-Ethernet Interworking, Pseudowire Core Connectivity, End-to-End Circuit, with Bridge Domain)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with pseudowire core connectivity for end-to-end circuit with multiple links. Bridge domain is enabled. One link terminates on an ATM interface on N-PE 1, and the other (non-flex) link terminates on an Ethernet interface on N-PE 2.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): ATM1/0/0.370.
 - The N-PE 2 is a Cisco ASR 9000 with IOS XR 3.9.0.
Interface(s): GigabitEthernet0/0/0/20.712.

Configlets

N-PE 1 (ATM)	N-PE 2 (Ethernet)
<pre>! interface ATM1/0/0.370 point-to-point no atm enable-ilmi-trap pvc 0/370 l2transport encapsulation aal5snap xconnect 10.20.21.1 4531 pw-class ISC-pw-tunnel-1 !</pre>	<pre>interface GigabitEthernet0/0/0/20.712 l2transport encapsulation dot1q 712 ! l2vpn bridge group tml bridge-domain CISCO interface GigabitEthernet0/0/0/20.712 ! neighbor 192.169.105.20 pw-id 1005 ! ! !</pre>

Comments

- None.

EVC (ATM-Ethernet Interworking, Pseudowire Core Connectivity, End-to-End Circuit, no Bridge Domain)

Configuration

- EVC/ATM-Ethernet Interworking.
- Feature: EVC for ATM-Ethernet interworking with pseudowire core connectivity for end-to-end circuit with multiple links. Bridge domain is disabled. One link is terminates on an ATM interface on N-PE 1, and the other link terminates on an Ethernet interface on N-PE 2.
- Device configuration:
 - The N-PE 1 is a Cisco 7600 with IOS 12.2(33) SRB3.
Interface(s): ATM1/0/0.370.
 - The N-PE 2 is a Cisco ASR 9000 with IOS XR 3.9.0.
Interface(s): GigabitEthernet0/0/0/12.433.

Configlets

N-PE 1 (ATM)	N-PE 2 (Ethernet)
<pre>! interface ATM1/0/0.370 point-to-point no atm enable-ilmi-trap pvc 0/370 l2transport encapsulation aal5snap xconnect 10.20.21.1 4531 pw-class ISC-pw-tunnel-1 !</pre>	<pre>interface GigabitEthernet0/0/0/12.433 l2transport encapsulation dot1q 433 rewrite ingress tag push dot1q 43 second-dot1q 53 symmetric ! l2vpn xconnect group ISC p2p CISCO interface GigabitEthernet0/0/0/12.433 neighbor 192.169.105.20 pw-id 4531 ! ! ! !</pre>

Comments

- None.

EVPL(Priority Tagged to Tagged, “A” – “Z”)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC Priority Tagged to Untagged (“A” – “Z”) .
- Device configuration:
 - The N-PE 1 is a Cisco ME3600 with IOS version 15.4(3)S.
Interface(s): GigabitEthernet0/1.
 - The N-PE 2 is a Cisco 7600 with IOS version 15.4(1)S.
Interface(s): GigabitEthernet3/2.

Configlets

N-PE 1 (“A” End)	N-PE 2 (“Z” End)
<pre> ethernet evc <Srv-Name-1> ! interface GigabitEthernet0/1 switchport trunk allowed vlan none switchport mode trunk service instance 1 ethernet <Srv-Name-1> encapsulation priority-tagged rewrite ingress tag pop 1 symmetric xconnect 7600-loopback ip <VCID> encap mpls </pre>	<pre> ethernet evc <Srv-Name> ! interface TenGigabitEthernet1/1 service instance 100 ethernet <name> encapsulation dot1q 100 rewrite ingress tag pop 1 symmetric xconnect ME3600-loopback ip <VCID> encap mpls </pre>

Comments

- None.

EVPL(Priority Tagged to Untagged, “A” – “Z”)

Configuration

- EVC/Metro Ethernet.
- Feature: EVC Priority Tagged to Untagged (“A” – “Z”).
- Device configuration:
 - The N-PE 1 is a Cisco ME3600 with IOS version 15.4(3)S.
Interface(s): GigabitEthernet0/1.
 - The N-PE 2 is a Cisco 7600 with IOS version 15.4(1)S.
Interface(s): GigabitEthernet3/2.

Configlets

N-PE 1 (“A” End)	N-PE 2 (“Z” End)
<pre> ethernet evc <Srv-Name-1> ! interface GigabitEthernet0/1 switchport trunk allowed vlan none switchport mode trunk service instance 1 ethernet <Srv-Name-1> encapsulation priority-tagged rewrite ingress tag pop 1 symmetric xconnect 7600-loopback ip <VCID> encap mpls </pre>	<pre> ethernet evc <Srv-Name> ! interface TenGigabitEthernet1/1 service instance 1 ethernet <name> encapsulation untagged xconnect ME3600-loopback ip <VCID> encap mpls </pre>

Comments

None.

