CHAPTER 4

Service Inventory—Discovery

This chapter describes how to use the Discovery feature to discover devices, connections, and services for the IP Solution Center (ISC) provisioning process. It contains the following sections:

Overview of ISC Discovery

ISC can expedite the process for building a network device inventory by discovering the devices, connections, and services that your MPLS VPN or L2VPN Metro Ethernet network comprises.

Note Service discovery is a complex operation that can be impacted by many variables within the network. The original network configuration must have been performed in accordance with the same rules that ISC follows when provisioning services. Otherwise, errors might occur during the discovery. As a result of the many possible configurations in a given network, it is strongly recommended that you contact your Cisco account team or Cisco advanced services to provide support, before committing to the service discovery process.

Users who run service discovery should have a thorough understanding of their overall network topology, should be familiar with network terminology, such as: PE, N-PE, U-PE, PE-AGG, and CE, and should understand the definition of NPC and Metro Ethernet/MPLS services in ISC.

ISC supports the discovery process for admin users only.

The ISC Discovery feature can be used to provision three of the applications in the Cisco ISC application suite:

- Cisco IP Solution Center MPLS VPN Management
- Cisco IP Solution Center L2VPN Management
- Cisco IP Solution Center MPLS Diagnostics Expert

Note Service discovery does not support Secure Shell version 2 (SSHv2) as a terminal session protocol. MPLS and L2VPN service discovery do not support devices running IOS XR.

When a device in ISC only has a hostname, the ISC device has no IP management address or domain name configured. If in Discovery, a device with the same hostname is discovered with an IP management address or is created manually in the Device Editor, the device might fail to commit to the ISC repository. The failure occurs because a match is determined with the existing ISC device, because both devices do not have a configured domain name.

The workaround is to do either 1. or 2., as follows:

1. Edit the device that exists in ISC and add the management IP address before Discovery. Discovery then treats that device as a duplicate and marks it read-only in the Device Editor.

   or

2. During Discovery, in the Device Editor, enter a domain name for the discovered device. Discovery then treats this as a new device.

The Cisco IP Solution Center Traffic Engineering Management has its own Discovery interface and process. This is documented in Chapter 2 of the *Cisco IP Solution Center Traffic Engineering Management User Guide, 5.0*, “TE Network Discovery.”

Multiple service discovery processes are supported and you can restart from any of the previous steps. Support for multiple discovery processes allows you to do incremental discovery of the network. The ability to restart from previous steps helps you roll back the discovery process to a selected previous step. You can then resume discovery from that step instead of needing to restart the entire discovery process from the beginning. Restarting from discovery data collection prompts the user to select devices for which data needs to be collected.

Incremental discovery occurs for existing VPN links. The existing VPNs are not editable in the discovery GUI and the existing VPN links are by-passed during commit.

There is no synchronization in MPLS and L2VPN service discovery. Any modification must be done manually through the ISC user interface. Only new VPNs are discovered. Also, services on existing modified NPCs and conflicting NPCs are not discovered.

The commit to ISC happens only at the end of the discovery phase, not after each step. The Discovery process does not change the state of ISC during discovery workflow. It is only at the end of the workflow that a user can commit the discovered devices and services to ISC.

The Discovery process provides you with several choices on how to discover your network topology.

3. If you are running Discovery to provision Cisco IP Solution Center MPLS VPN Management or Cisco IP Solution Center L2VPN Management, you can choose between three Discovery methods:
   a. CDP Discovery

      You can use the Cisco Discovery Protocol (CDP) to discover devices connected to an initial device that has an IP address you provide in a **policy.xml** file.

   b. Device/Topology Based Discovery

      You can use a Device/Topology-based method. This method uses XML files that specify device and NPC topology information.

   c. Import Configuration File Based

      You can use an Import Configuration Files-based method. This method uses a directory on the server that contains configuration files for the devices to be discovered and an XML file that contains device connectivity information that is used to automatically create NPCs.

4. You can choose the network topology to discover an MPLS VPN topology, an L2VPN (Metro Ethernet) topology, or both.

   If you choose L2VPN (Metro Ethernet) Discovery, you can discover either a Metro Ethernet with an MPLS core, a Metro Ethernet with an Ethernet core, or a combination of the two, a mixed core. In a mixed core, the L2VPN services can span across the MPLS core or they can be confined to a local Ethernet domain alone (local switched services). Local switched services that do not traverse N-PE devices across an ethernet domain can also be discovered. Figure 4-1, "Mixed Core," shows a mixed core.

Figure 4-1 Mixed Core

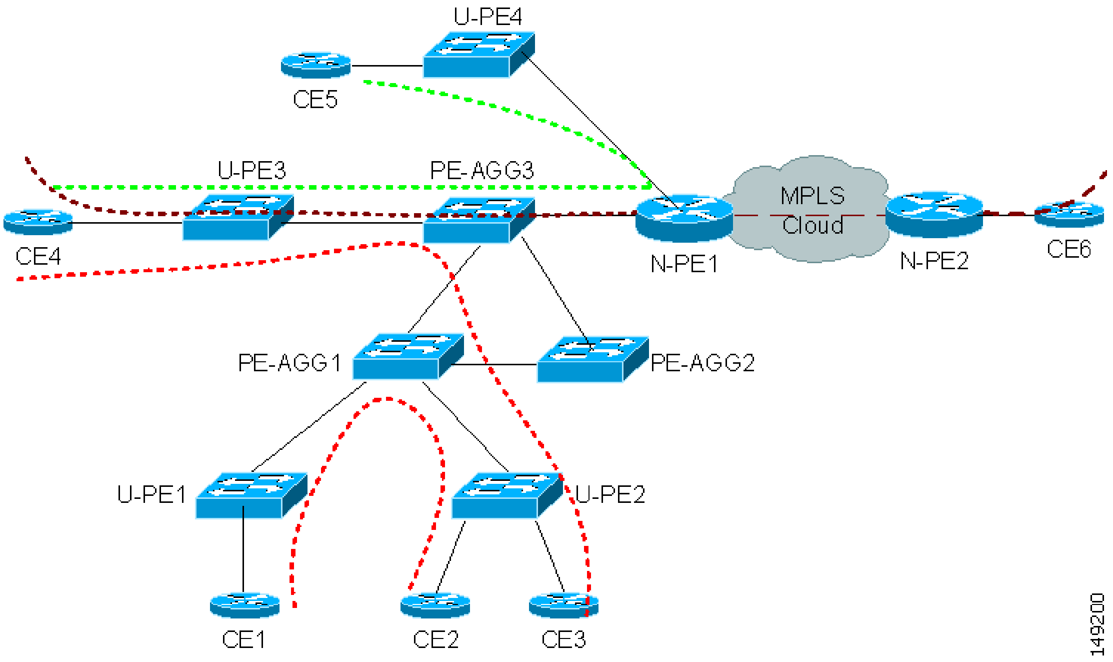


Figure 4-2 illustrates the phases in the Discovery process.

Figure 4-2 ISC Discovery Steps

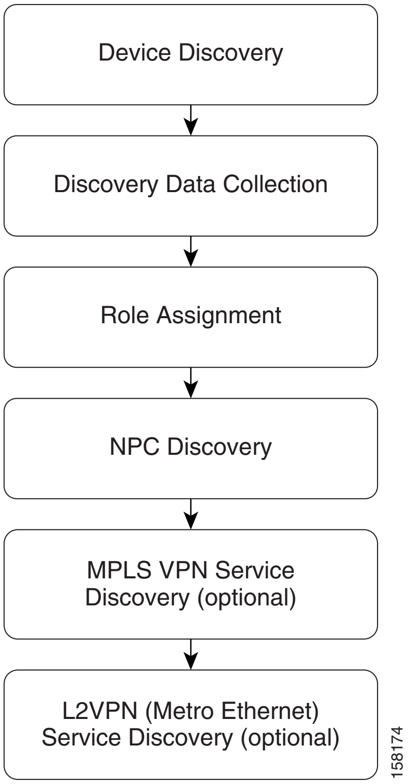

Device Discovery
Discovery Data Collection
Role Assignment
NPC Discovery
MPLS VPN Service Discovery (optional)
L2VPN (Metro Ethernet) Service Discovery (optional)
158174

Table 4-1 describes the phases in the Discovery process.

Table 4-1 Steps in the Discovery Process

Step	Description
Device Discovery	Discovers devices in the MPLS VPN and/or Metro Ethernet topology.
Discovery Data Collection	Collects the IOS configuration for the devices discovered.
Role Assignment	Does the role assignment for the discovered devices based on rules.xml, and prompts you to edit the device roles as N-PE, U-PE, or CE. **Note** A sample is found at: $ISC_HOME/resources/discovery/data/rules.xml, where the rules.xml file must be kept.
NPC Discovery	Displays discovered NPCs and allows addition or removal of NPCs.

Table 4-1 Steps in the Discovery Process (continued)

Step	Description
MPLS VPN Discovery	Discovers the topology for your MPLS VPN network and allows you to change it as required. **Note** The MPLS VPN Discovery step is not required if you are using ISC Discovery with Cisco IP Solution Center MPLS Diagnostics Expert.
(L2VPN) Metro Ethernet Discovery	Discovers the topology for your Metro Ethernet network and allows you to change it as required. **Note** The (L2VPN) Metro Ethernet Discovery step is not required if you are using ISC Discovery with Cisco IP Solution Center MPLS Diagnostics Expert.

Technical Notes for ISC Discovery

This section presents technical tips and general information about the ISC Discovery process.

The ISC Discovery feature can be used to provision three of the applications in the Cisco ISC application suite:

- Cisco IP Solution Center MPLS VPN Management
- Cisco IP Solution Center L2VPN Management
- Cisco IP Solution Center MPLS Diagnostics Expert

Although the general steps are similar, there are some differences in the workflow for the various types of Discovery. These are described in the section covering each ISC application:

- Using ISC Discovery with Cisco IP Solution Center MPLS VPN Management, page 4-6
- Using ISC Discovery With Cisco IP Solution Center L2VPN Management, page 4-7
- Using ISC Discovery with Cisco IP Solution Center MPLS Diagnostics Expert, page 4-7
- Using ISC Discovery With Cisco IP Solution Center Traffic Engineering Management, page 4-8

Note Cisco IP Solution Center Traffic Engineering Management has its own Discovery interface and process.

This is documented in Chapter 2 of the *Cisco IP Solution Center Traffic Engineering Management User Guide, 5.0*, “TE Network Discovery.”

For technical notes on using ISC Discovery in installations that include both Cisco IP Solution Center Traffic Engineering Management and Cisco IP Solution Center MPLS VPN Management, see Using ISC Discovery With Cisco IP Solution Center Traffic Engineering Management, page 4-8.

General Notes

Note the following points before running ISC Discovery:

- You can use the ISC GUI to create providers, customers, and resource pools before doing Discovery.
- Only one user can control the Discovery workflow interface at a given time.
- The procedures in the chapter show a “generic” procedure. If you do not have licenses for a particular application, you will not see the selections for that application on the start screen for ISC Discovery.
- Perform “manual” device collection after discovery is over.
- After you have started the Discovery process, a **Restart** button appears on the Discovery Workflow window. You can click the **Restart** button, a drop-down list of completed steps pops up and you can select a step and restart from that step.
- Restarting from initialization aborts the current discovery process.
- Discovery using Role Based Access Control (RBAC) is not supported.

Using the Discovery Log Files

A log file is written for each phase of the Discovery process. You can view a log file by clicking the **View** selection in the Log column next to each discovery phase summary on the Discovery Workflow window.

The log file provides useful information in the event a discovery step fails.

Using ISC Discovery with Cisco IP Solution Center MPLS VPN Management

If you are running the Discovery process to discover an MPLS VPN network for use with Cisco IP Solution Center MPLS VPN Management, note the following points:

- You must perform all of the main steps in the Discovery process.
- You can use either CDP Discovery, Device/Topology, or Import Configuration Files-based Discovery. The recommendation is to use either Device/Topology or Import Configuration Files-based Discovery.
- ISC does not support partial mesh VPN topologies. If the Discovery process discovers a Partial Mesh VPN, you must split the partial mesh VPN into smaller units (usually a combination of full mesh VPNs and Hub and Spoke VPNs).
- After completion of the automated Discovery process, you must schedule and run a **Task Manager > Collect Config** task for all discovered devices.

Note There is no synchronization in MPLS service discovery. Any modification must be done manually through the ISC user interface. Only new VPNs are discovered. Also, services on existing modified NPCs and conflicting NPCs are not discovered.

Using ISC Discovery With Cisco IP Solution Center L2VPN Management

If you are running the Discovery process to discover an L2VPN network that will be provisioned and managed using Cisco IP Solution Center L2VPN Management, note the following points:

- You must perform all of the main steps in the Discovery process.
- You can use either CDP Discovery, Device/Topology, or Import Configuration Files-based Discovery. The recommendation is to use either Device/Topology or Import Configuration Files-based Discovery.
- A new L2VPN service is discovered when any of the following are found compared to the services existing in ISC:
  - A new Virtual LAN Identifier (VLAN ID) in an Ethernet core (Ethernet access domain)
  - A new Virtual Circuit Identifier (VC ID) for virtual private wire service (VPWS) services on an MPLS core.
  - A new VPLS Forwarding Instance Identifier (VFI ID) for virtual private LAN service (VPLS) services on an MPLS core.
- The Discovery process for Cisco IP Solution Center L2VPN Management can discover Metro Ethernets with an MPLS core, an Ethernet core, or both.
- Prior to performing the NPC Discovery step for Cisco IP Solution Center L2VPN Management, you must specify the Access Domain for N-PE devices.
- Any new links that are configured on NPCs marked as Existing Modified or Conflicting are not discovered.
- After completion of the automated Discovery process, you must schedule and run a **Task Manager > Collect Config** task for all discovered devices.

Note There is no synchronization in L2VPN service discovery. Any modification must be done manually through the ISC user interface. Only new VPNs are discovered. Also, services on existing modified NPCs and conflicting NPCs are not discovered.

Using ISC Discovery with Cisco IP Solution Center MPLS Diagnostics Expert

If you are running the Discovery process to discover an MPLS VPN network for use with Cisco MPLS Diagnostics Expert, note the following points.

- You can use either CDP Discovery, Device/Topology, or Import Configuration Files-based Discovery. The recommendation is to use either Device/Topology or Import Configuration Files-based Discovery.
- For Cisco IP Solution Center MPLS Diagnostics Expert, you only need to perform the Device Discovery, Discovery Data Collection, and Role Assignment Steps. You do not need to perform the NPC Discovery step or the Service Discovery step. However, you can let the NPC Discovery process run.

  See Figure 4-5 on page 4-13 for a flowchart of the required steps for ISC Discovery with Cisco IP Solution Center MPLS Diagnostics Expert.
- If you are using Cisco IP Solution Center MPLS Diagnostics Expert, then you normally only need to discover P and PE devices. Therefore, when you perform the Role Assignment step for discovered devices, you only need to assign roles to the P and PE devices.

Note If you do discover any CE devices, you must assign them CE roles.

- After completion of the automated Discovery process, you must schedule and run a **Task Manager > Collect Config** task for all discovered devices.

Using ISC Discovery With Cisco IP Solution Center Traffic Engineering Management

Normally you do not have to run the ISC Discovery process if you are using Cisco IP Solution Center Traffic Engineering Management. Cisco IP Solution Center Traffic Engineering Management has its own discovery process,. This process is documented in Chapter 2 of the *Cisco IP Solution Center Traffic Engineering Management User Guide, 5.0*, "TE Network Discovery."

However, if you are running *both* Cisco IP Solution Center Traffic Engineering Management (TEM) and Cisco IP solution Center MPLS VPN Management, you must run the Discovery process for Cisco IP Solution Center MPLS VPN Management.

Note the following points:

- One region (default region) is used for TEM.
- If you are also running ISC Discovery for MPLS VPN Management, make sure you run the Discovery workflow described in this chapter *first*, and then run the Cisco IP Solution Center Traffic Engineering Management process later.

Summary of Tasks for Discovery (Cisco ISC MPLS VPN Management and L2VPN Management)

Figure 4-3 provides a general workflow diagram for the Discovery process used with the Cisco IP Solution Center MPLS VPN Management or Cisco IP Solution Center L2VPN Management application.

Note Figure 4-5 on page 4-13 provides a general workflow diagram for the Discovery process as used with the MPLS Diagnostics Expert application.

Figure 4-3 Basic Workflow for Discovery with Cisco ISC MPLS VPN Management or Cisco ISC L2VPN Management

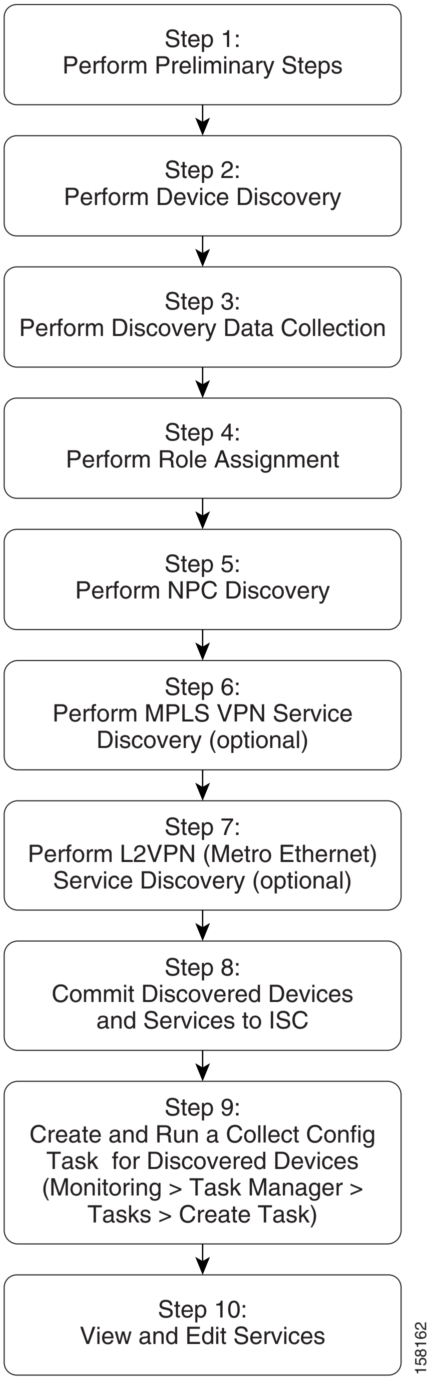

Step 1:
Perform Preliminary Steps
Step 2:
Perform Device Discovery
Step 3:
Perform Discovery Data Collection
Step 4:
Perform Role Assignment
Step 5:
Perform NPC Discovery
Step 6:
Perform MPLS VPN Service Discovery (optional)
Step 7:
Perform L2VPN (Metro Ethernet) Service Discovery (optional)
Step 8:
Commit Discovered Devices and Services to ISC
Step 9:
Create and Run a Collect Config Task for Discovered Devices (Monitoring > Task Manager > Tasks > Create Task)
Step 10:
View and Edit Services
158162

Table 4-2 describes each task in the Discovery workflow for Cisco ISC MPLS VPN Management and Cisco ISC L2VPN Management.

Table 4-2 Description of Discovery Steps for MPLS VPN and L2VPN Management

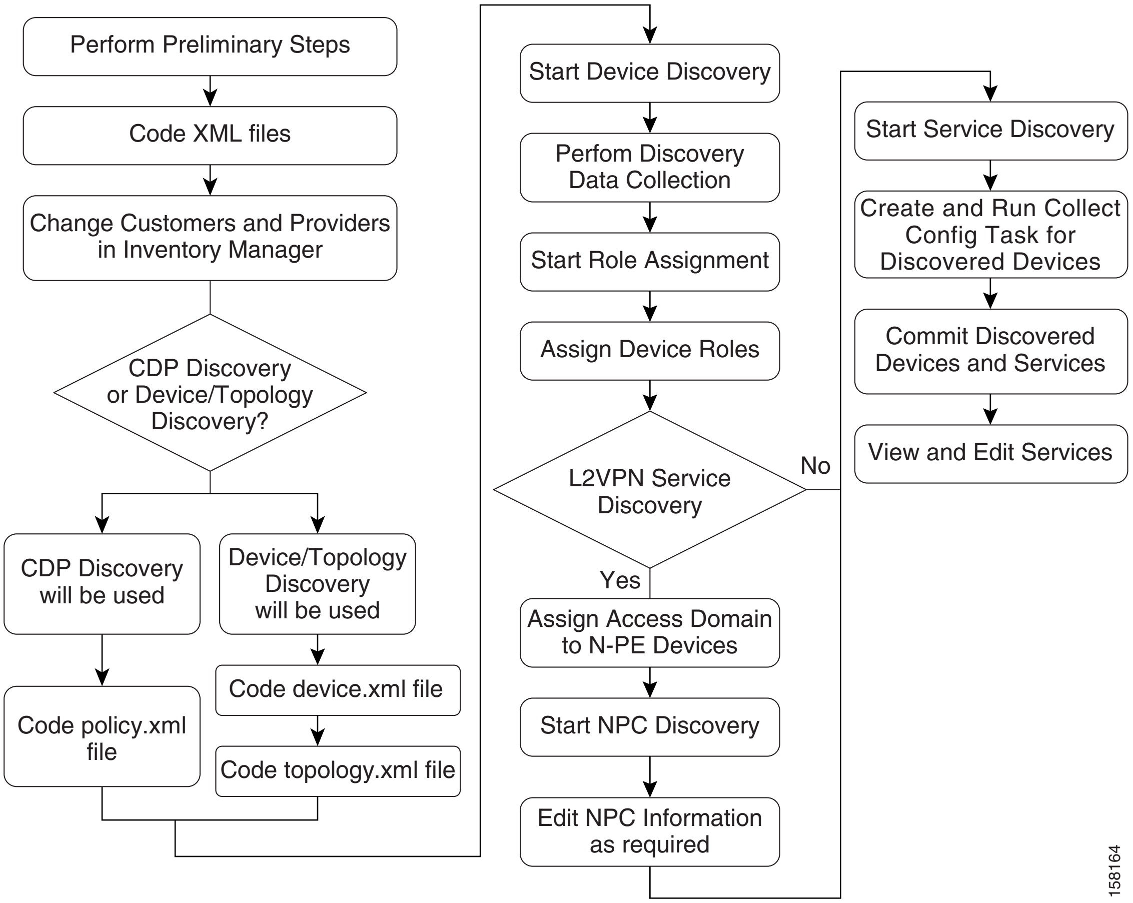
Step	Description
Step 1: Perform Preliminary Steps	Perform preliminary steps that are required for ISC Discovery. See Step 1: Perform Preliminary Steps, page 4-15. • Review System Requirements See Review System Requirements, page 4-16. • Install Licenses See Install Licenses, page 4-17. • (CDP Discovery Only) Verify That a Unique TIBCO Port Is Defined See (CDP Discovery Only) Verify That a Unique TIBCO Port Is Defined, page 4-17 • (CDP Discovery Only) Verify That CDP Is Running on Devices To Be Discovered See (CDP Discovery Only) Verify That CDP Is Running on Devices To Be Discovered, page 4-18. • Code XML Files Required for Discovery See Code XML Files Required for Discovery, page 4-19.
Step 2: Perform Device Discovery	• Start Device Discovery See Starting Device Discovery, page 4-26. • After Device Discovery is complete, enter device passwords For information on entering device passwords, see Setting Password Attributes (Required Step), page 4-33. • Enter additional device information as required See Setting General Device Attributes, page 4-35 and Setting Cisco CNS Attributes, page 4-36.
Step 3: Perform Discovery Data Collection	Start configuration collection. No input is required for this step. See Step 3: Perform Discovery Data Collection, page 4-37.
Step 4: Perform Role Assignment	Assign device roles to each device. See Step 4: Perform Role Assignment, page 4-37.
Step 5: Perform NPC Discovery	If you are discovering a Metro Ethernet Network with an Ethernet Core, perform the required preliminary steps. See Preliminary Steps Before Completing NPC Discovery for Metro Ethernet Networks, page 4-50 • Start NPC Discovery See Step 5: Perform NPC Discovery, page 4-50. • Modify and/or add NPCs as required. See Adding a Device for an NPC, page 4-54, Adding a Ring, page 4-55, Inserting a Device, page 4-56, Inserting a Ring, page 4-56, or Deleting a Device or a Ring, page 4-56.

Table 4-2 Description of Discovery Steps for MPLS VPN and L2VPN Management (continued)

Step	Description
Step 6: Perform MPLS VPN Service Discovery (optional)	Start MPLS VPN Service Discovery. See Step 6: Perform MPLS VPN Service Discovery (Optional), page 4-57. This step is required for the Cisco IP Solution Center MPLS VPN Management application, **Note** This step is not required for the Cisco IP Solution Center L2VPN Management application or the Cisco IP Solution Center MPLS Diagnostics Expert application.
Step 7: Perform L2VPN Service Discovery (optional)	Start L2VPN Service Discovery. See Step 7: Perform L2VPN (Metro Ethernet) Service Discovery (Optional), page 4-66. This step is required for the Cisco IP Solution Center L2VPN Management application. **Note** This step is not required for the Cisco IP Solution Center MPLS VPN Management application or the Cisco IP Solution Center MPLS Diagnostics Expert application.
Step 8: Commit Discovered Devices and Services to ISC Repository	Commit the discovered devices and services to the ISC repository. Prior to this step, discovery workflow stores the discovered devices and services in a temporary repository, which gets committed to ISC only at the last step of discovery workflow.
Step 9: Create and Run a Collect Config Task for Discovered Devices	From the ISC Start Page, choose **Monitoring > Task Manager**. Select the **Collect Config** task and select all of the devices discovered in the Device Discovery step; then submit the task. See Step 9: Create and Run a Collect Config Task for the Discovered Devices, page 4-79.
Step 10: View and Edit Services	The discovered services will be in Pending state and you need to do a config audit to move them to Deployed state. See Step 10: View and Edit Services, page 4-79.

Within each step, additional tasks must be performed and choices must be made. Figure 4-4 shows a detailed flowchart that illustrates all of the steps in the Discovery workflow.

Figure 4-4 Detailed Diagram of Discovery Steps (Cisco ISC MPLS VPN Management and Cisco ISC L2VPN Management)


Perform Preliminary Steps
Code XML files
Change Customers and Providers in Inventory Manager
CDP Discovery or Device/Topology Discovery?
CDP Discovery will be used
Device/Topology Discovery will be used
Code policy.xml file
Code device.xml file
Code topology.xml file
Start Device Discovery
Perfom Discovery Data Collection
Start Role Assignment
Assign Device Roles
L2VPN Service Discovery
No
Yes
Assign Access Domain to N-PE Devices
Start NPC Discovery
Edit NPC Information as required
Start Service Discovery
Create and Run Collect Config Task for Discovered Devices
Commit Discovered Devices and Services
View and Edit Services
158164

Summary of ISC Discovery Steps for MPLS Diagnostics Expert

Figure 4-5 shows the basic Discovery steps for Cisco ISC with the MPLS Diagnostics Expert (MDE) application. For MDE, several of the steps required for Cisco ISC MPLS VPN Management and Cisco ISC L2VPN Management are not required.

Figure 4-5 Discovery Workflow for the MPLS Diagnostics Expert Application

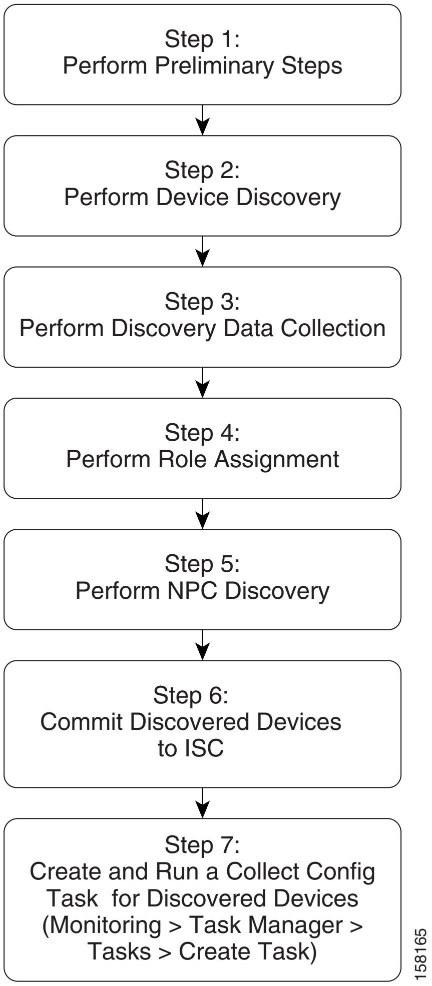

Step 1:
Perform Preliminary Steps
Step 2:
Perform Device Discovery
Step 3:
Perform Discovery Data Collection
Step 4:
Perform Role Assignment
Step 5:
Perform NPC Discovery
Step 6:
Commit Discovered Devices to ISC
Step 7:
Create and Run a Collect Config Task for Discovered Devices (Monitoring > Task Manager > Tasks > Create Task)
158165

Table 4-3 Description of Discovery Steps for MPLS Diagnostics Expert

Step	Description
Step 1: Perform Preliminary Steps	Perform preliminary steps that are required for ISC Discovery. • Review System Requirements See Review System Requirements, page 4-16. • Install Licenses See Install Licenses, page 4-17 • Code XML Files Required for Discovery For specific instructions, see the following section: – Code XML Files Required for Discovery, page 4-19.
Step 2: Perform Device Discovery	• Start Device Discovery See Starting Device Discovery, page 4-26. • After Device Discovery is complete, enter device passwords For information on entering device passwords, see Setting Password Attributes (Required Step), page 4-33. • Enter additional device information as required See Setting General Device Attributes, page 4-35 and Setting Cisco CNS Attributes, page 4-36.
Step 3: Perform Discovery Data Collection	Start configuration collection. No input is required for this step. See Step 3: Perform Discovery Data Collection, page 4-37.

Table 4-3 Description of Discovery Steps for MPLS Diagnostics Expert (continued)

Step	Description
Step 4: Perform Role Assignment	Assign device roles to each device. See Step 4: Perform Role Assignment, page 4-37. For MDE, you normally discover only P and PEs and assign P and PE roles to them However, if you discover CEs, assign CE roles to the CE devices. **Note** Although you do not have to edit NPCs for MPLS Diagnostics Expert, after you perform role assignment this step should complete.
Step 5: Create and Run a Collect Config Task for Discovered Devices	From the ISC Start Page, choose **Monitoring > Task Manager**. Select the **Collect Config** task and select all of the devices discovered in the Device Discovery step; then submit the task. See Step 8: Commit Discovered Devices and Services to ISC Repository, page 4-78.

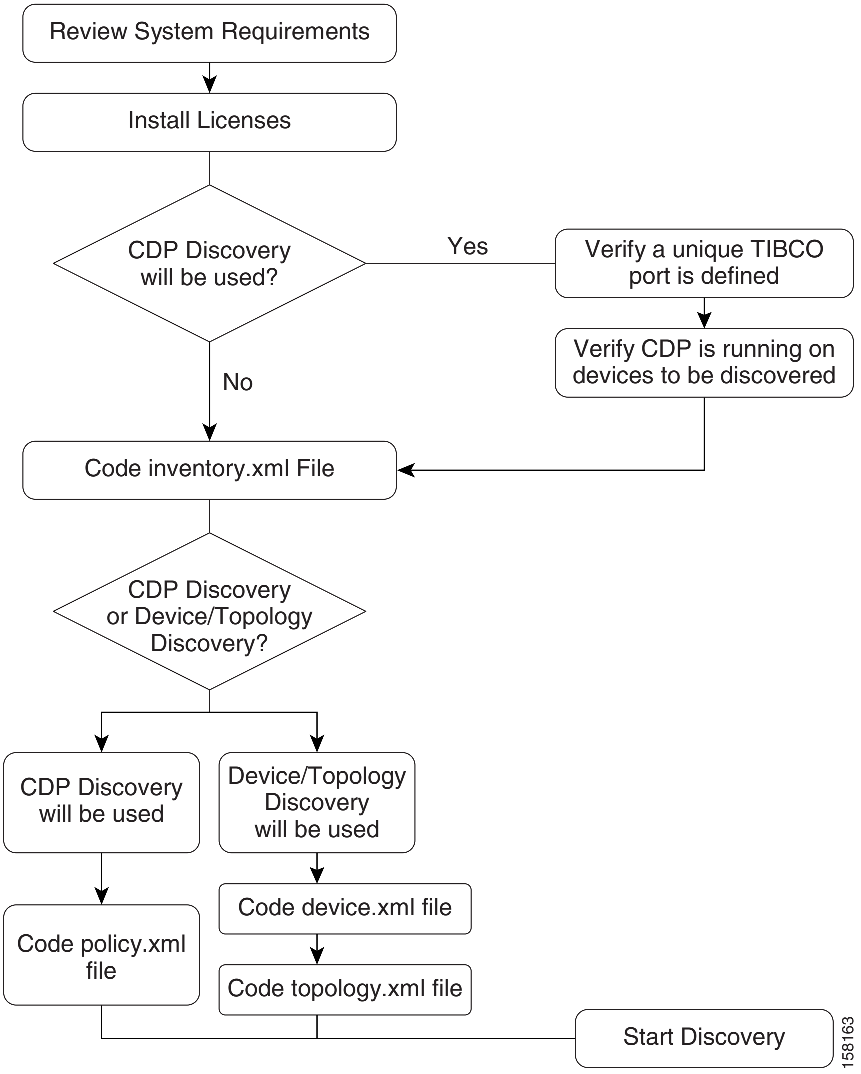
Step 1: Perform Preliminary Steps

Before you initiate the ISC Discovery process, complete the following preliminary steps:

- Review System Requirements
- Install Licenses
- Discovery in Large Networks
- (CDP Discovery Only) Verify That a Unique TIBCO Port Is Defined
- (CDP Discovery Only) Verify That CDP is Running on Devices To Be Discovered
- Code XML Files Required for Discovery

Figure 4-6 summarizes the preliminary steps for ISC Discovery.

Figure 4-6 Summary of Preliminary Steps for Discovery


Review System Requirements
Install Licenses
CDP Discovery will be used?
Yes
Verify a unique TIBCO port is defined
Verify CDP is running on devices to be discovered
No
Code inventory.xml File
CDP Discovery or Device/Topology Discovery?
CDP Discovery will be used
Device/Topology Discovery will be used
Code device.xml file
Code topology.xml file
Code policy.xml file
Start Discovery
158163

Review System Requirements

Cisco recommends that you thoroughly review the system requirements for ISC before planning your installation, to be sure that you have all the hardware and software that you must successfully install.

The system recommendations and requirements for ISC are listed in Chapter 1, “System Recommendations” of the *Cisco IP Solution Center Installation Guide, 5.0* and in the *Release Notes for Cisco IP Solution Center, 5.0.1.*

Install Licenses

Before starting Discovery, the appropriate licenses (both Activation and VPN licenses) must be installed. Also, each license must be large enough to handle all possible discovered objects. For information on installing licenses, see the "Installing License Keys" section of Chapter 2 of the *Cisco IP Solution Center Installation Guide, 5.0*, "Installing and Logging In to ISC."

Discovery in Large Networks

To discover large networks with a complex topology, we recommend you reset two DCPL properties, as follows:

Step 1 See Appendix C, "Property Settings" for an explanation of how to navigate to the Dynamic Component Properties Library (DCPL) properties.

Step 2 Navigate to the property **watchdog\server\discovery\heartbeat\timeout** and set this property to **180000 milliseconds** (3 minutes).

Step 3 Navigate to the property **watchdog\server\discovery\java\flags** and set this property to **-Xmx3072m -XX:PermSize=256m -XX:MaxPermSize=512m**

Step 4 Restart the ISC server.

Heap is a block of memory segment for the L2VPN and Metro Ethernet, Layer 3 MPLS VPN, and TEM components. It is allocated for use by the Java virtual machine (JVM) process during runtime. It might need to be increased for large deployments. If the **httpd** process restarts, increase the heap size, as follows:

Step 1 **cd $ISC_HOME/bin**

Step 2 **vi tomcat.sh**

Step 3 Search for a line with **-Xmx512m**

Step 4 Set the heap size to 1GB or 2GB by replacing **-Xmx512m** with **-Xmx1024m** or **-Xmx2048m**, respectively.

Step 5 Save the **tomcat.sh** file.

Step 6 Enter **stopall** to stop the ISC server.

Step 7 Enter **startwd** to start the ISC server.

(CDP Discovery Only) Verify That a Unique TIBCO Port Is Defined

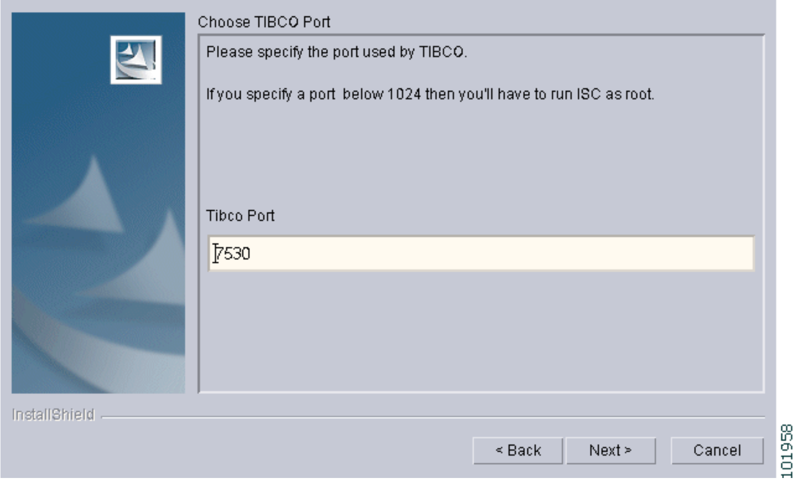
If you are using CDP Discovery to discover the network topology, make sure the TIBCO Port is unique. Otherwise, CDP discovery will fail.

During installation, the TIBCO port can be specified if the “custom” Installation Type is selected at the start of the installation process. Otherwise, the default port installed is 7530. You specify the TIBCO port on the Choose TIBCO Port dialog.

The port number that is specified must be unique throughout the network, and no other ISC installations are allowed with the same port.

Figure 4-7 shows the Choose TIBCO Port dialog.

Figure 4-7 Choose TIBCO Port



Choose TIBCO Port

Please specify the port used by TIBCO.

If you specify a port below 1024 then you'll have to run ISC as root.

Tibco Port: 7530

The Tibco port can be changed after installation by modifying vpnsc.properties.

(CDP Discovery Only) Verify That CDP Is Running on Devices To Be Discovered

If CDP Discovery is going to be used, use the **show cdp** command to ensure that CDP is running on all of the devices intended to be discovered.

For each device, enter the **show cdp** command, as shown in Example 4-1.

Example 4-1 The show cdp Command:

```
Router# show cdp
Global CDP information:
        Sending CDP packets every 120 seconds
        Sending a holdtime value of 180 seconds
        Sending CDPv2 advertisements is enabled
Router#
```

Note When performing CDP Discovery for devices with more than one IP address configured, it is possible that CDP discovery will find an IP address other than the management IP address. If the IP address found is not accessible from the ISC server, then it will not be possible to discover that device using CDP discovery.

Code XML Files Required for Discovery

Before you can run ISC Discovery, you must code XML files that are required for the Discovery process. A different set of files is required, depending on whether you use CDP Discovery or Device/Topology-based Discovery.

Table 4-4 describes the XML files and indicates which files are required for each type of discovery method.

Table 4-4 XML Files Used with ISC Discovery

XML File	Description	Required for CDP Discovery	Required for Device/Topology Based Discovery
policy.xml	Specifies one or more seed IP addresses that can be reached from the specified seed device and a maximum hop count for the device discovery process.	Yes	No
device.xml	Specifies information used to locate devices, such as device IP addresses and Object IDs (OIDs).	No	Yes
topology.xml	Specifies information used to build NPCs used by MPLS VPN and/or Metro Ethernet topology.	No	Yes

Note Make sure that the coding in your XML files is accurate. If there are errors in the files, you might need to re-run the Discovery process.

Sample XML Files

The initial installation of ISC provides sample XML files that you can use as a starting point in coding your own XML files. The sample XML files are located in the following directory:

<*install_directory*>**/resources/discovery/sample**

where *install_directory is the installation directory that you specified when prompted by the ISC installation program.*

Coding the policy.xml File

The **policy.xml** file:

- Is required for CDP Discovery.
- Is required for Cisco IP Solution Center MPLS VPN Management, Cisco IP Solution Center Metro Ethernet and L2VPN Management, and Cisco MPLS Diagnostics Expert.
- Is not required for Device/Topology-based Discovery.
- Is not required for Cisco IP Solution Center Traffic Engineering Management.
- Provides a seed IP address that the CDP protocol uses to discover devices near the seed device.

Example 4-2 shows the sample **policy.xml** file that is provided with the ISC installation.

Example 4-2 Sample policy.xml File

```
<?xml version='1.0' encoding='UTF-8'?>
<DISCOVERY_POLICY overwrite_existing_policy="true">
  <DISCOVERY_METHOD>
    <CDP ipaddress="209.168.133.232" hop="1"/>
  </DISCOVERY_METHOD>
  <SNMP_COMMUNITY>
    <RO_COMMUNITY>
      <COMMUNITY community="public"/>
    </RO_COMMUNITY>
    <RW_COMMUNITY>
      <COMMUNITY community="private"/>
    </RW_COMMUNITY>
  </SNMP_COMMUNITY>

</DISCOVERY_POLICY>
```

If there are additional routers that are on the other side of PE routers on the edge of the core segment of the network, you can specify more than one seed IP address in order to discover these devices.

Example 4-3 shows a **policy.xml** file that contains two seed IP addresses.

Example 4-3 Policy.xml File with Two IP Addresses

```
<?xml version='1.0' encoding='UTF-8'?>
<DISCOVERY_POLICY overwrite_existing_policy="true">
  <DISCOVERY_METHOD>
    <CDP ipaddress="209.168.133.241" hop="8"/>
  </DISCOVERY_METHOD>
  <DISCOVERY_METHOD>
    <CDP ipaddress="209.168.133.244" hop="8"/>
  </DISCOVERY_METHOD>
  <SNMP_COMMUNITY>
    <RO_COMMUNITY>
      <COMMUNITY community="public"/>
    </RO_COMMUNITY>
    <RW_COMMUNITY>
      <COMMUNITY community="private"/>
    </RW_COMMUNITY>
  </SNMP_COMMUNITY>

</DISCOVERY_POLICY>
```

Table 4-5 describes the XML tags used in the **policy.xml** file.

Table 4-5 XML Tags and Attributes Used in the policy.xml File

Tag	Description
<DISCOVERY_METHOD>	Starts a **<DISCOVERY_METHOD>** tag. The **<DISCOVERY_METHOD>** tag must contain a **<CDP>** tag.
<CDP>	Starts a **<CDP>** tag. The **<CDP>** tag specifies a seed IP address and a hop count. The **<CDP>** tag must contain the following attributes: • **ipaddress** • **hop**

Table 4-5 XML Tags and Attributes Used in the policy.xml File (continued)

Tag	Description
ipaddress	Specifies the IP address of a seed device. Required attribute for the **<CDP>** tag.
hop	Specifies the number of hops from the device identified by the ipaddress attribute to go in discovering devices. Required attribute for the **<CDP>** tag.

Follow these steps to edit the sample **policy.xml** file:

Step 1 Edit the sample file and replace the IP address specified with the **ipaddress** XML attribute with an appropriate IP address from your network.

This IP address is a device that can be reached from the ISC host. For each seed device, an accessible interface on the starting point is configured, because the management interface must be provided. The management interface is the address on the device that the ISC host uses to reach the device.

Note You can provide more than one IP address. This is useful in situations where one network domain is on the other side of a PE router on the edge of the core segment of the network.

Step 2 Edit the hop count specified with the **hop** attribute and specify a hop count that will be used when the Discovery process is initialized.

When you choose the seed devices and hop count, pick a seed device that can reach a large section of the network. Pick one or more of them until you think these devices will enable you to reach your entire managed network.

Point-of-presence (POP) routers are usually good choices. If you choose all the POPs in your network as the collection of seed devices and put in the appropriate number of hubs, you discover the entire managed network.

To pick the hop count number, go to the CE that is the furthest from its associated POP, and count the number of devices between them. If this number is N, the hub number is N+1, assuming you are picking the POP as the seed.

Step 3 If you need to add additional IP addresses for seed devices, code additional **<DISCOVERY_METHOD>** tags.

Within the additional **<DISCOVERY_METHOD>** tags, include **<CDP>** tags.

For each **<CDP>** tag, specify an IP address with the **ipaddress** attribute and a hop count with the **hops** attributes.

Step 4 Save the **policy.xml** file to an appropriate directory on the ISC host.

When you run the Discovery process, the process queries the starting point device for its CDP table. From this table, all of those devices are queried for their CDP information. This process continues until the maximum hop count from the starting point is reached. When you use the CDP-based method, note that only devices running CDP are discovered.

Coding the device.xml File

The **device.xml** file:

- Is required for Device/Topology-based Discovery.
- Is not required for CDP-based Discovery.
- Is required for Cisco IP Solution Center MPLS VPN Management, Cisco IP Solution Center L2VPN Management, and ISC MPLS Diagnostics Expert.
- Is not required for Cisco IP Solution Center Traffic Engineering Management.
- Specifies information used to locate devices, such as device IP addresses and Object IDs (OIDs).

Example 4-4 shows a sample **device.xml** file. Use the sample file as an example and save your edited file in an appropriate directory.

Example 4-4 Sample device.xml file

```
<network>
<device>
<device-name>mlpe8</device-name>
<ip-address>209.168.133.244</ip-address>
<system-object-id>.1.3.6.1.4.1.9.1.509</system-object-id>
<snmp-info>
<ro-community>public</ro-community>
</snmp-info>
</device>

<device>
<device-name>mlsw11</device-name>
<ip-address>209.168.133.170</ip-address>
<system-object-id>.1.3.6.1.4.1.9.1.574</system-object-id>
<snmp-info>
<ro-community>public</ro-community>
</snmp-info>
</device>

<device>
<device-name>mlsw16</device-name>
<ip-address>209.168.133.175</ip-address>
<system-object-id>.1.3.6.1.4.1.9.1.574</system-object-id>
<snmp-info>
<ro-community>public</ro-community>
</snmp-info>
</device>

<device>
<device-name>mlsw17</device-name>
<ip-address>209.168.133.176</ip-address>
<system-object-id>.1.3.6.1.4.1.9.1.574</system-object-id>
<snmp-info>
<ro-community>public</ro-community>
</snmp-info>
</device>

</network>
```

Table 4-6 describes the XML tags used in the **device.xml** file.

Table 4-6 XML Tags Used in the device.xml File

Tag	Description
<**device**>	Starts a **<device>** tag. The **<device>** tag must contain the following tags: • **<device-name>** • **<ip-address>** The following tags are optional within the **<device>** tag: • **<system-object-id>** • **<snmp-info>**
<device-name>	Specifies the name of the device. Required within the **<device>** tag.
<ip-address>	Specifies the IP address of the device. Required within the **<device>** tag.
<system-object-id>	(optional) Can be included to specify the SNMP Object ID (OID) for the device. If this is provided, it is specified within the **<device>** tag.
<**snmp-info**>	Specifies SNMP information for the device. The **<snmp-info>** tag must contain a **<ro-community>** tag. Optional within the **<device>** tag.
<ro-community>	Specifies the level of SNMP access for the device. Normally, this should be “public.” Required within the **<snmp-info>** tag.

Follow these steps to code the **device.xml** file:

Step 1 Edit the sample **device.xml** file provided with the installation.

Step 2 For each device that is to be discovered by ISC, code a **<device>** entry. Each **<device>** entry should contain the following tags:

- A **<device-name>** tag specifying the device name.
- An **<ip-address>** tag specifying the IP address for the device.
- A **<system-object-id>** tag specifying the OID for the device (optional).
- An **<snmp-info>** tag specifying **<ro-community>** information

Step 3 Save the **device.xml** file to an appropriate directory on the ISC host.

Coding the topology.xml File

The **topology.xml** file:

- Is required for Device/Topology-based Discovery.

- Is not required for CDP-based Discovery.
- Is required to perform ISC Discovery for Cisco IP Solution Center MPLS VPN Management, Cisco IP Solution Center L2VPN Management, and Cisco IP Solution Center MPLS Diagnostics Expert.
- Is not required for Cisco IP Solution Center Traffic Engineering Management.
- Specifies information used to locate devices, such as device IP addresses and Object IDs (OIDs).

The **topology.xml** file specifies the discovery protocol that is used in the discovery process, and, for each connection, specifies the starting IP address, the starting interface, the end device, and the end interface

Example 4-5 shows a sample **topology.xml** file. Use the sample file as an example and save your edited file in an appropriate directory.

Example 4-5 Sample topology.xml File

```
<topology>
<connection discovery-protocol="CDP" fromDevice="mlsw19"  fromIP="209.168.133.178"
fromInterface="GigabitEthernet1/1/2"   toDevice="mlsw21"  toIP="209.168.133.220"
toIF="GigabitEthernet1/1/1" >
</connection>

<connection discovery-protocol="CDP" fromDevice="mlsw19"  fromIP="209.168.133.178"
fromInterface="FastEthernet1/0/23"   toDevice="mlsw21"  toIP="209.168.133.220"
toIF="FastEthernet1/0/24" >
</connection>

<connection discovery-protocol="CDP" fromDevice="mlsw19"  fromIP="209.168.133.178"
fromInterface="FastEthernet
1/0/24"   toDevice="mlsw18"  toIP="209.168.133.177"  toIF="FastEthernet1/0/23" >
</connection>

<connection discovery-protocol="CDP" fromDevice="mlsw19"  fromIP="209.168.133.178"
fromInterface="FastEthernet1/0/22"   toDevice="mlsw22"  toIP="209.168.133.221"
toIF="FastEthernet1/0/24" >
</connection>

</topology>
```

Table 4-7 describes the XML tags used in the **topology.xml** file.

Table 4-7 XML tags and Attributes Used in the topology.xml File

Tag	Description
<connection>	Starts a **<connection>** tag. The **<connection>** tag must specify the following attributes: • **discovery-protocol** • **fromDevice** • **FromIP** • **FromInterface** • **toDevice** • **toIP** • **toIF**
discovery-protocol	Specifies the Discovery protocol used to discover the network topology. Normally, this is “CDP.”

Table 4-7 XML tags and Attributes Used in the topology.xml File (continued)

Tag	Description
fromDevice	Specifies the name of the device from which the Named Physical Circuit starts. Required attribute for the **<connection>** tag.
FromIP	Specifies the management IP address of the device from which the Named Physical Circuit starts. Required attribute for the **<connection>** tag.
FromInterface	Specifies the name of the device interface from which the Named Physical Circuit starts. Required attribute for the **<connection>** tag.
toDevice	Specifies the name of the device to which the Named Physical Circuit connects. Required attribute for the **<connection>** tag.
toIP	Specifies the management IP address of the device from which the Named Physical Circuit connects. Required attribute for the **<connection>** tag.
toIF	Specifies the device interface on the device to which the Named Physical Circuit connects. Required attribute for the **<connection>** tag.

Follow these steps to code the **topology.xml** file:

Step 1 Edit the sample **topology.xml** file provided with the installation.

Step 2 For each NPC connection that is to be discovered by ISC, code a **<connection >** entry. Each **<connection>** entry must contain the following tags:

- A **discovery-protocol** attribute specifying the CDP protocol.
- A **fromDevice** attribute specifying the device from which the NPC starts.
- A **FromIP** attribute specifying the management IP address from which the NPC starts.
- A **FromInterface** attribute specifying the device interface from which the NPC starts.
- A **toDevice** attribute specifying the name of the device to which the NPC connects.
- A **toIP** attribute specifying the management IP address of the device to which the NPC connects
- A **toIF** attribute specifying the name of the interface on the device to which the NPC connects

Step 3 Save the **topology.xml** file to an appropriate directory on the ISC host.

Step 2: Perform Device Discovery

This section describes how to start the device discovery process and edit device configuration.

Starting Device Discovery

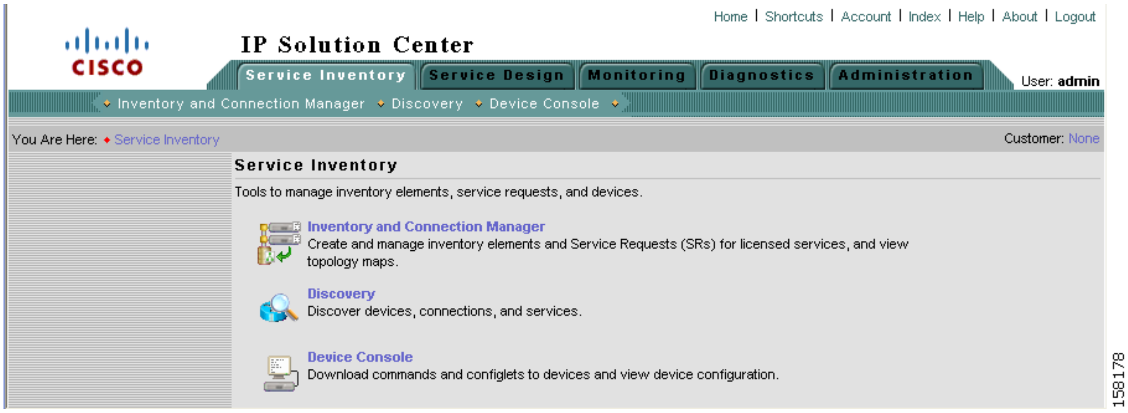
To start discovery, follow these steps:

Step 1 Log in to ISC.

Step 2 Click the **Service Inventory** tab.

Step 3 The Service Inventory window appears, as shown in Figure 4-8.

Figure 4-8 Service Inventory Window



Service Inventory

Tools to manage inventory elements, service requests, and devices.

Inventory and Connection Manager
Create and manage inventory elements and Service Requests (SRs) for licensed services, and view topology maps.

Discovery
Discover devices, connections, and services.

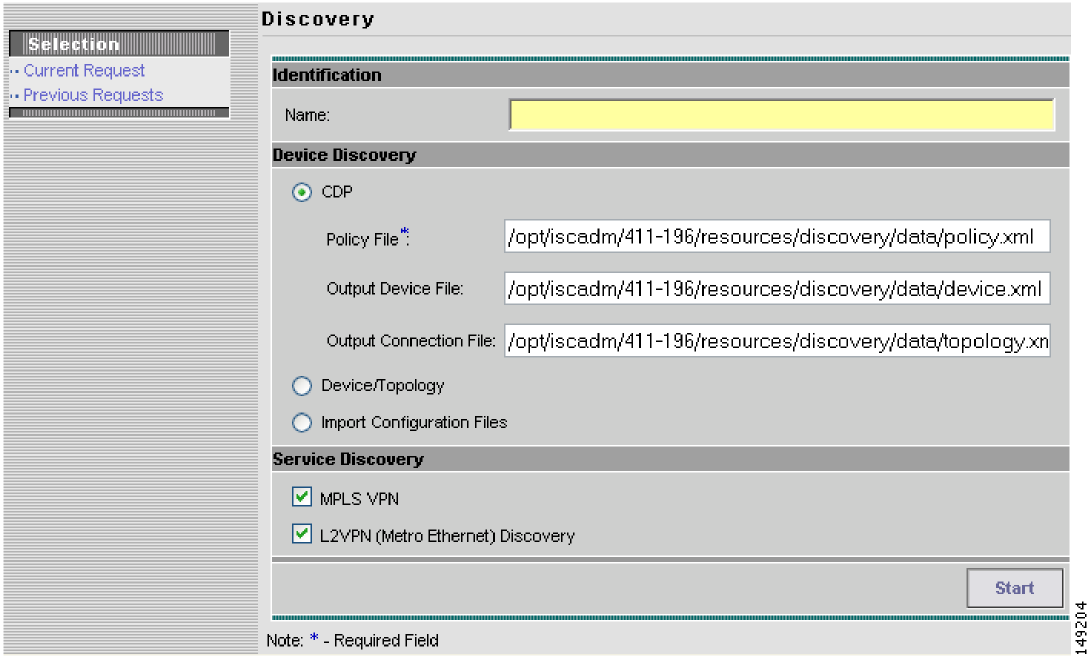
Device Console
Download commands and configlets to devices and view device configuration.

Step 4 Click **Discovery**.

The Discovery window appears, as shown in Figure 4-9.

Initially, the CDP Discovery method is selected and the window displays the required input for this method.

Figure 4-9 Device Discovery—CDP Fields



Discovery

Identification

Name:

Device Discovery

● CDP

Policy File*: /opt/iscadm/411-196/resources/discovery/data/policy.xml

Output Device File: /opt/iscadm/411-196/resources/discovery/data/device.xml

Output Connection File: /opt/iscadm/411-196/resources/discovery/data/topology.xn

○ Device/Topology

○ Import Configuration Files

Service Discovery

☑ MPLS VPN

☑ L2VPN (Metro Ethernet) Discovery

Note: * - Required Field

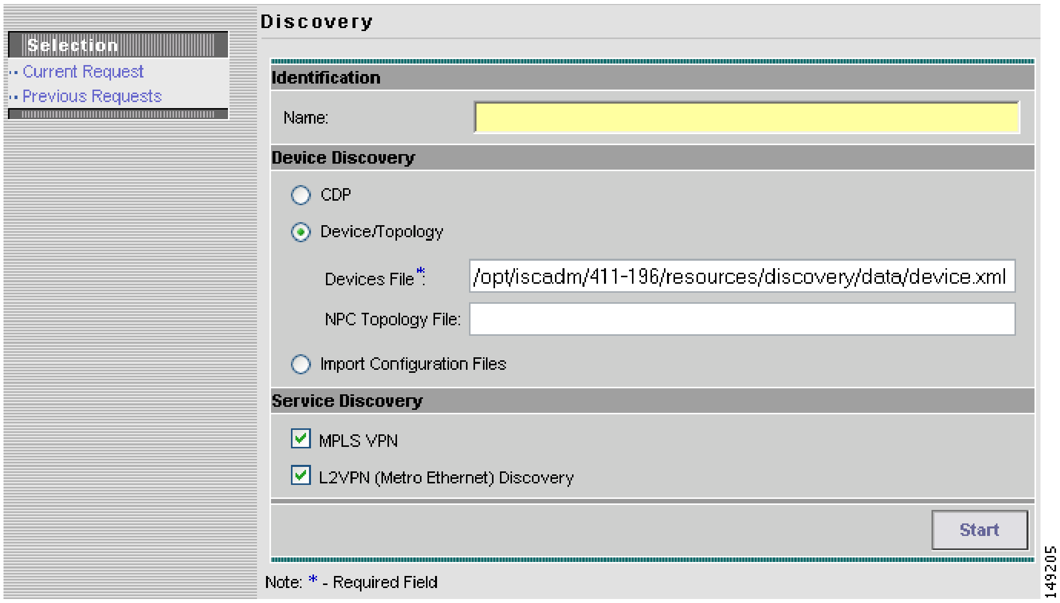
The editable **Output Device File** field is optional and defaults to an XML file of the discovered devices. This file can then be an input **Devices File** for rerunning discovery using the **Device/Topology** option, by choosing that radio button.

The editable **Output Connection File** is optional and defaults to an XML file that contains device connectivity information that is written during CDP Device Discovery. This file can then be an input **NPC Topology File** for rerunning discovery using the Device/Topology option, by choosing that radio button.

Step 5 Choose a Discovery method:

- To use the Cisco Discovery Protocol (CDP) method, click the **CDP** radio button, with the resulting window as shown in Figure 4-9, "Device Discovery—CDP Fields."
- To use the Device/Topology method, click the **Device/Topology** button, with the resulting widow as shown in Figure 4-10, "Device Discovery—Device/Topology Fields."
- To use the Import Configuration Files method, click the **Import Configuration Files** button, with the resulting window as shown in Figure 4-11, "Device Discovery—Import Configuration File Fields."

Figure 4-10 Device Discovery—Device/Topology Fields



Discovery

Identification

Name:

Device Discovery

○ CDP
● Device/Topology

Devices File*: /opt/iscadm/411-196/resources/discovery/data/device.xml

NPC Topology File:

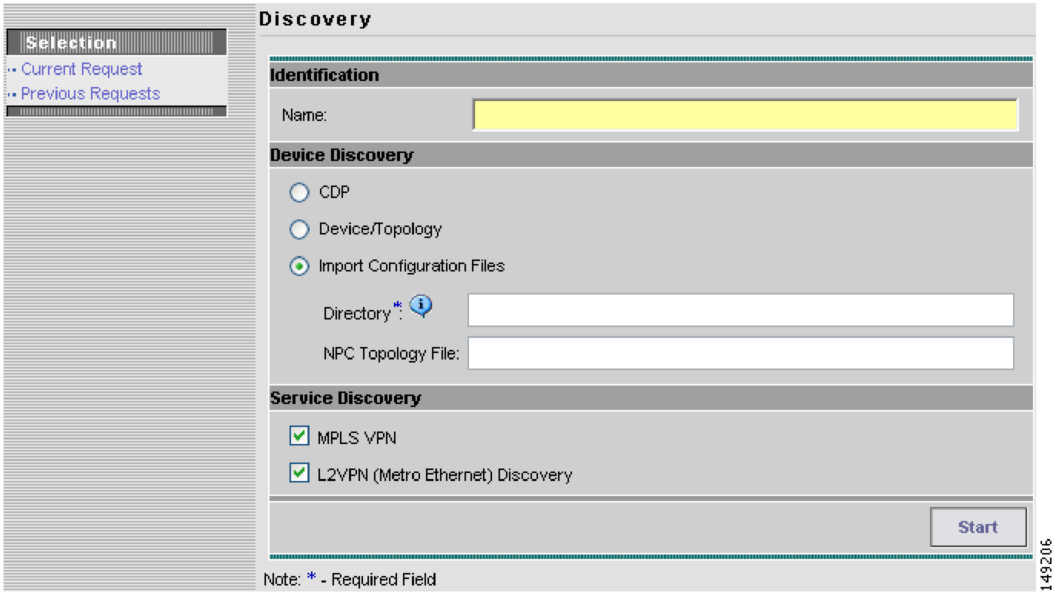
○ Import Configuration Files

Service Discovery

☑ MPLS VPN
☑ L2VPN (Metro Ethernet) Discovery

Note: * - Required Field

Figure 4-11 Device Discovery—Import Configuration File Fields



Discovery

Identification

Name:

Device Discovery

○ CDP
○ Device/Topology
● Import Configuration Files

Directory*:

NPC Topology File:

Service Discovery

☑ MPLS VPN
☑ L2VPN (Metro Ethernet) Discovery

Note: * - Required Field

The required **Directory** field is the directory on the server that contains configuration files for the devices to be discovered. The format of these files *must* be <*filename*>**.cfg**.

The **NPC Topology File** field contains an XML file that contains device connectivity information that is used to automatically create NPCs.

Note During service discovery, Providers, Regions, Customers, and Sites are not automatically created, and therefore you must manually create them before running service discovery. If Resource Pools are used for provisioning in ISC, Access Domains and Resource Pools must be manually created before running service discovery.

Step 6 In the Discovery window, specify the settings indicated in Table 4-8.

Table 4-8 Discovery Settings

Setting	Description
Name	In this field, enter a unique name of your choice for the Workflow name. If you do not enter a name in this field, the system automatically generates a unique name for you.
CDP	Click this radio button to select Cisco Discovery Protocol (CDP) as the Discovery method.
Policy File	If you click the **CDP** button, specify the path to your **policy.xml** file here. This file is an XML file that indicates the IP address of one or more devices used as a starting point for the discovery process. For more information on the **policy.xml** file, see Coding the policy.xml File, page 4-19.
Output Device File	This editable optional field defaults to an XML file of the discovered devices. This file can then be an input **Devices File** for rerunning discovery using the **Device/Topology** option.
Output Connection File	This editable optional field defaults to an XML file that contains device connectivity information that is written during CDP device discovery. This file can then be an input **NPC Topology File** for rerunning discovery using the **Device/Topology** option.
Device/Topology	Click this radio button to select Device/Topology as the Discovery method.
Devices File	If you click the **Device/Topology** button, specify the path to your **device.xml** file here. This file contains information used to locate the devices in your network, such as IP addresses and OIDs. For more information on the **device.xml** file, see Coding the device.xml File, page 4-22.
NPC Topology File	If you click this optional **Device/Topology** button, specify the path to your **topology.xml** file here. This file contains information used to determine the NPC topology of your network. For more information on the **topology.xml** file, see Coding the topology.xml File, page 4-23.

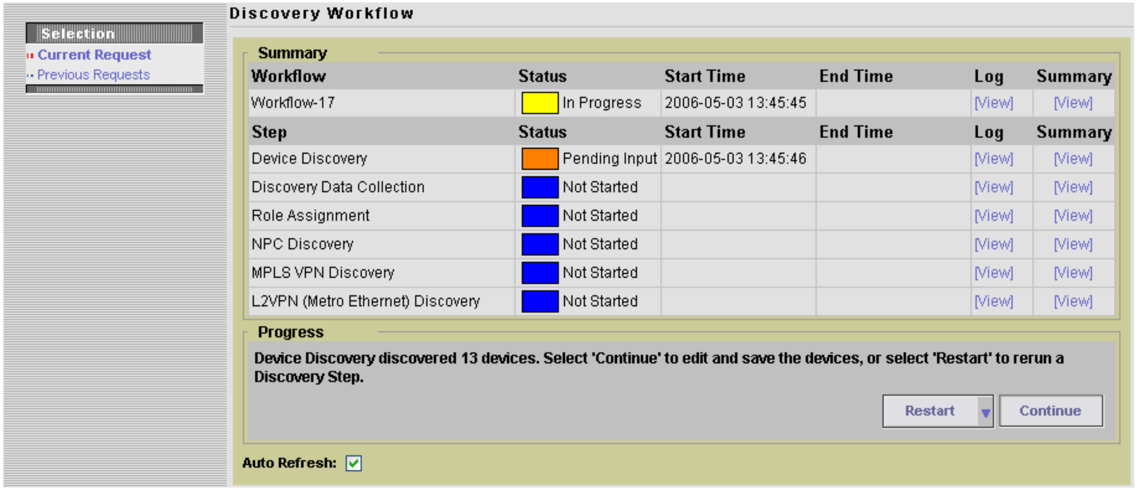
Table 4-8 Discovery Settings (continued)

Setting	Description
Import Configuration Files	Click this radio button to select Import Configuration Files as the Discovery method.
Directory	This required field is the directory on the server that contains configuration files for the devices to be discovered. The format of these files *must* be <*filename*>**.cfg**.
NPC Topology File	This field contains an XML file that contains device connectivity information that is used to automatically create NPCs.
MPLS VPN	To discover devices used in an MPLS VPN service, click the **MPLS VPN** radio button.
L2VPN (Metro Ethernet) Discovery	To discover layer 2 devices used in a Metro Ethernet service, click the **L2VPN (Metro Ethernet) Discovery** radio button.

Step 7 Click the **Start** button.

The discovery process starts and the Discovery Workflow window appears, as shown in Figure 4-12.

Figure 4-12 Discovery Workflow Window



Discovery Workflow

Summary

Workflow	Status	Start Time	End Time	Log	Summary
Workflow-17	🟨 In Progress	2006-05-03 13:45:45		[View]	[View]
Step	**Status**	**Start Time**	**End Time**	**Log**	**Summary**
Device Discovery	🟧 Pending Input	2006-05-03 13:45:46		[View]	[View]
Discovery Data Collection	🟦 Not Started			[View]	[View]
Role Assignment	🟦 Not Started			[View]	[View]
NPC Discovery	🟦 Not Started			[View]	[View]
MPLS VPN Discovery	🟦 Not Started			[View]	[View]
L2VPN (Metro Ethernet) Discovery	🟦 Not Started			[View]	[View]

Progress

Device Discovery discovered 13 devices. Select 'Continue' to edit and save the devices, or select 'Restart' to rerun a Discovery Step.

Auto Refresh: ☑

The **Workflow** category in the data pane gives the name information about the current discovery request/workflow.

Click the **Restart** button and you receive a drop-down list of completed steps. Select a step and you will restart from that step.

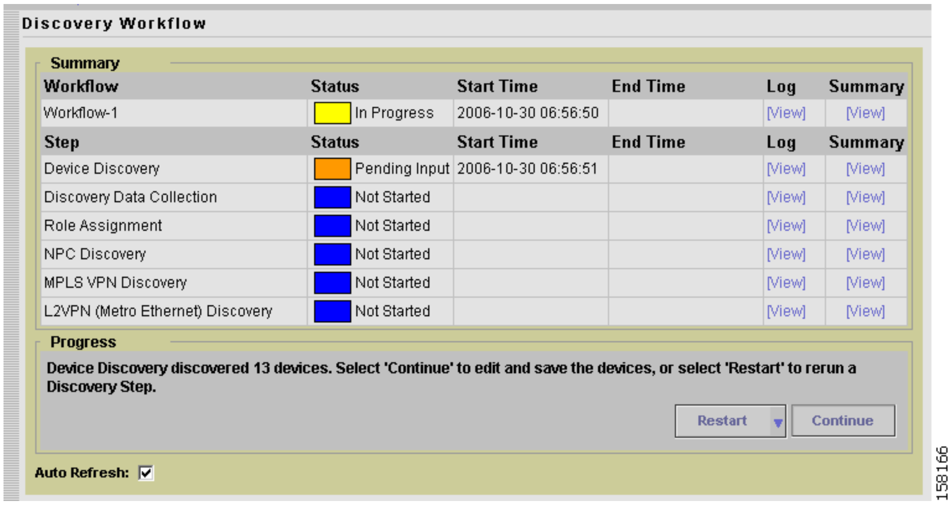
In the left column, **Current Request** gives the discovery request/workflow that is currently running. If there is no currently running discovery request/workflow, an initialization window appears to create a new discovery request/workflow.

In the left column, **Previous Requests** lists all the discovered requests/workflows. You can look at the status and logs for any of these discovery requests/workflows.

Discovery Workflow window indicates the progress of each phase of device discovery:

- When the window first appears, the status indicator is yellow and indicates that the device discovery process is **Initializing**.
- The status indicator then indicates that the process is **In Progress**.
- After the discovery processes has completed, the display indicates how many devices were discovered, and the status indicator changes to orange and indicates that there is **Pending Input, as shown in Figure 4-13.**

Figure 4-13 Discovery Workflow Window with Device Input Pending



Summary

Workflow	Status	Start Time	End Time	Log	Summary
Workflow-1	🟨 In Progress	2006-10-30 06:56:50		[View]	[View]
Step	**Status**	**Start Time**	**End Time**	**Log**	**Summary**
Device Discovery	🟧 Pending Input	2006-10-30 06:56:51		[View]	[View]
Discovery Data Collection	🟦 Not Started			[View]	[View]
Role Assignment	🟦 Not Started			[View]	[View]
NPC Discovery	🟦 Not Started			[View]	[View]
MPLS VPN Discovery	🟦 Not Started			[View]	[View]
L2VPN (Metro Ethernet) Discovery	🟦 Not Started			[View]	[View]

Progress

Device Discovery discovered 13 devices. Select 'Continue' to edit and save the devices, or select 'Restart' to rerun a Discovery Step.

Auto Refresh: ☑

The Progress area at the bottom of the window indicates how many devices were discovered.

At the lower right of the window there is a **Restart** button. You can click this button to restart the entire discovery process. However, if you restart the Discovery process, any work that has been done previous to restarting Discovery is lost.

Note After each phase of the Discovery process, make sure that you check the log file to ensure that there were no errors in the process. For specific instructions, see Using the Discovery Log Files, page 4-6.

Editing Device Configurations

After the initial discovery of devices in your network, you must edit the information that ISC maintains about the devices. This allows the Discovery process to collect configuration information about the devices that are required to determine the network topology and generate service requests.

Editing device configuration includes these steps:

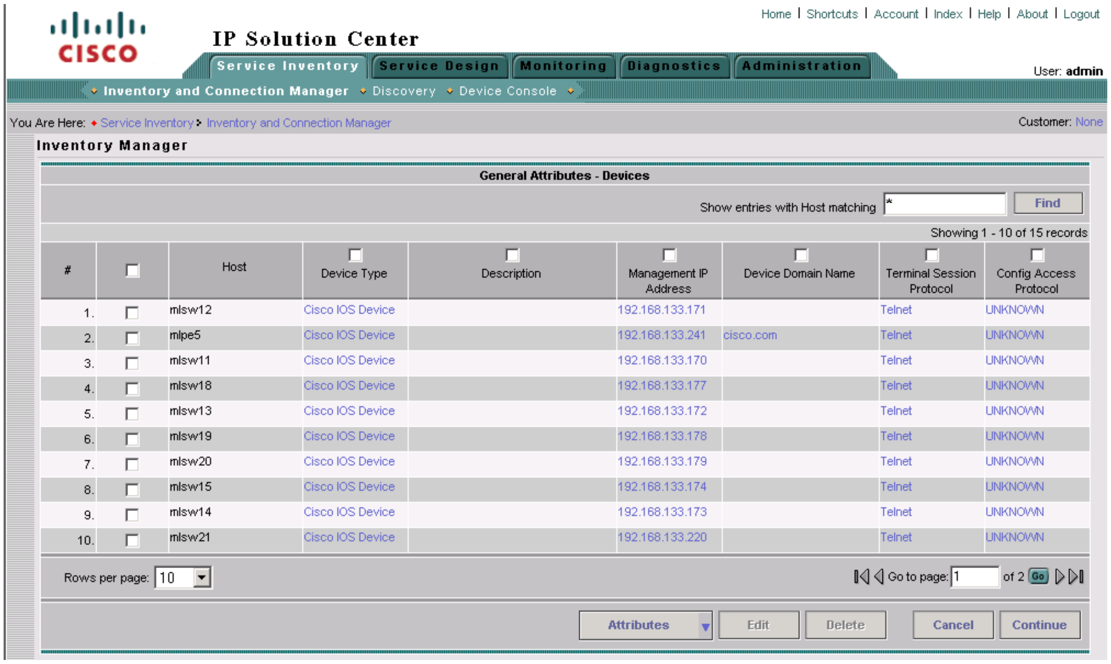
- Setting Password Attributes (a required step)
- Setting General Device Attributes
- Setting Cisco CNS Attributes

Follow these steps to edit device configurations:

Step 1 When the Discovery Workflow window indicates that the Device Discovery is **Pending Input,** click the **Continue** button.

Step 2 The General Attributes - Devices window appears, as shown in Figure 4-14.

Figure 4-14 The General Attributes-Devices Window


Home | Shortcuts | Account | Index | Help | About | Logout
IP Solution Center
Service Inventory
Service Design
Monitoring
Diagnostics
Administration
User: admin
Inventory and Connection Manager
Discovery
Device Console
You Are Here: Service Inventory > Inventory and Connection Manager
Customer: None
Inventory Manager
211185

General Attributes - Devices

Show entries with Host matching * Find

Showing 1 - 10 of 15 records

#	□	Host	□ Device Type	□ Description	□ Management IP Address	□ Device Domain Name	□ Terminal Session Protocol	□ Config Access Protocol
1.	□	mlsw12	Cisco IOS Device		192.168.133.171		Telnet	UNKNOWN
2.	□	mlpe5	Cisco IOS Device		192.168.133.241	cisco.com	Telnet	UNKNOWN
3.	□	mlsw11	Cisco IOS Device		192.168.133.170		Telnet	UNKNOWN
4.	□	mlsw18	Cisco IOS Device		192.168.133.177		Telnet	UNKNOWN
5.	□	mlsw13	Cisco IOS Device		192.168.133.172		Telnet	UNKNOWN
6.	□	mlsw19	Cisco IOS Device		192.168.133.178		Telnet	UNKNOWN
7.	□	mlsw20	Cisco IOS Device		192.168.133.179		Telnet	UNKNOWN
8.	□	mlsw15	Cisco IOS Device		192.168.133.174		Telnet	UNKNOWN
9.	□	mlsw14	Cisco IOS Device		192.168.133.173		Telnet	UNKNOWN
10.	□	mlsw21	Cisco IOS Device		192.168.133.220		Telnet	UNKNOWN

Rows per page: 10   Go to page: 1 of 2 Go

Attributes Edit Delete Cancel Continue

The General Attributes - Devices window allows you to do the following:

1. Delete devices.

   If devices appear in the device list that you do not want to configure, you can delete them, as explained in Step 5.

2. Set the following groups of attributes for each device:

– **General Attributes**—The general attributes include the hostname of the device, the device type, the management IP address, and other settings.

  You can accept the default attributes shown in the General Attributes - Devices window or change them as required.

  For a list of the general attributes, see Setting General Device Attributes, page 4-35.

– **Password Attributes**—The password attributes include the username and password for the device and the enable username and password for the device. You *must* set these attributes.

– **CNS Attributes**—If the device is a CNS device, set the CNS attributes.

Step 3 If you want to filter the devices that appear in the window, enter part of the device name for the devices that you want to view, preceded or followed by the asterisk (*) and then click the **Find** button.

If the Find field displays an asterisk, all devices are displayed.

The setting in the Find field applies to all of the attributes windows.

Step 4 To change the display to show one of the attributes areas, click the **Attributes** button at the bottom of the window and use the pull-down list to select the attributes area to display.

- If you need to change the general attributes for the device, such as the protocol used to configure the device (Config Access Protocol), you can do this in the initial window that appears.

  If the General Attributes - Devices window is not the current window, click the **Attributes** button and select **General Attributes** from the pull-down list.

  See Setting Password Attributes (Required Step), page 4-33 for instructions on setting the General Attributes.

- To set the password attributes, click the **Attributes** button and then select Password Attributes from the pull-down list.

  For instructions on setting the password attributes, see Setting Password Attributes (Required Step), page 4-33.

Note This is a required step. To enable configuration collection, you *must* set the password attributes.

- If you need to change the CNS attributes, see Setting Cisco CNS Attributes, page 4-36.

Step 5 If you want to delete one or more devices, follow these steps:

a. Check the check box next to each device that you want to delete.

If you need to delete more than one device, you can check the check box next to the heading for the list of the devices. This selects all of the devices in the list. You can then uncheck the boxes next to any devices that you do not want to delete.

b. To delete the devices, click the **Delete** button.

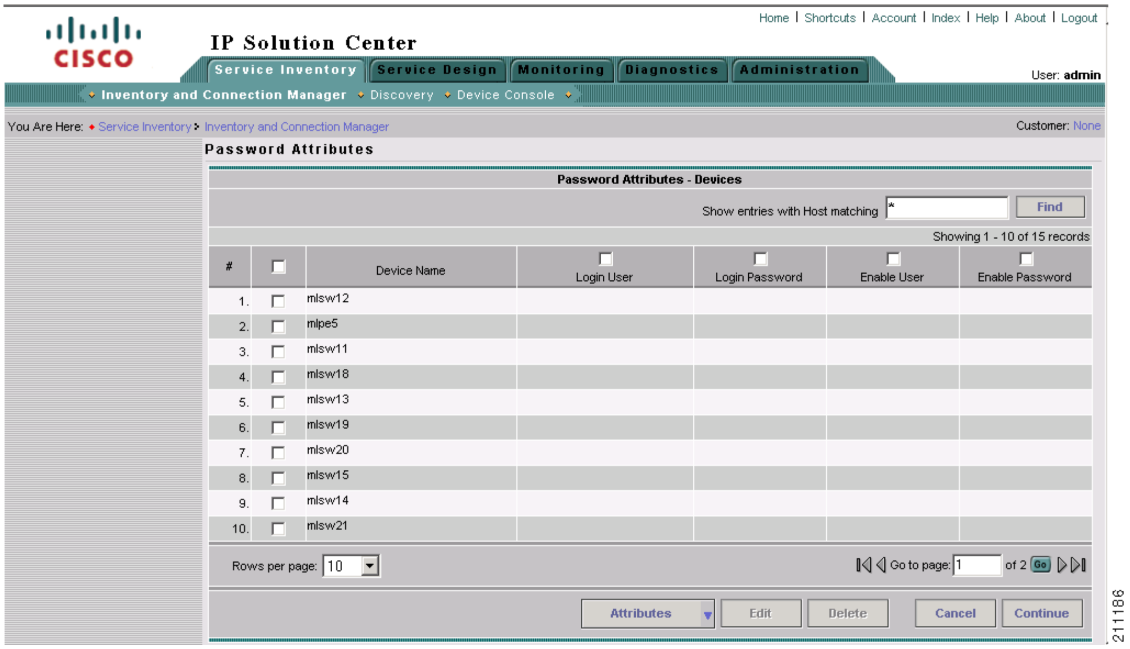
Setting Password Attributes (Required Step)

In order for the Configuration Collection phase to succeed, you *must* set the password attributes for each device. Follow these steps to set password attributes:

Step 1 If the Password Attributes window is not the current window, click the **Attributes** button and select **Password Attributes** from the pull-down list.

Step 2 The Password Attributes window appears, as shown in Figure 4-15.

Figure 4-15 Password Attributes Window



Password Attributes - Devices

Showing 1 - 10 of 15 records

#	□	Device Name	□ Login User	□ Login Password	□ Enable User	□ Enable Password
1.	□	mlsw12				
2.	□	mlpe5				
3.	□	mlsw11				
4.	□	mlsw18				
5.	□	mlsw13				
6.	□	mlsw19				
7.	□	mlsw20				
8.	□	mlsw15				
9.	□	mlsw14				
10.	□	mlsw21				

Step 3 Follow these steps to select the devices and password attributes to configure:

a. Check the check box next to a device that has password attributes you want to configure.

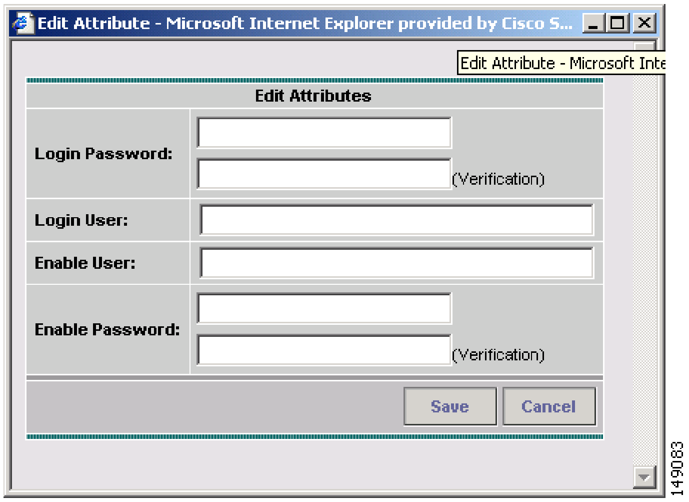
If several devices have the same password attributes, you can check multiple check boxes. If all of the devices have the same password attributes, you can check the box to the left of the heading row to select all of the devices in the list. If this check box is checked, you can uncheck it to deselect all of the devices.

b. To select the password attributes to configure, check one or more of the check boxes next to the attribute names in the heading row.

Step 4 Click the **Edit** button.

The Edit Attributes window for passwords appears, as shown in Figure 4-16.

Figure 4-16 Edit Attributes Window for Password Attributes



Step 5 Enter the following information for the device:

- **Login Password**—Enter the login password for the device
- **Login User**—Enter the username for the device
- **Enable Use**r—Enter the name of a user with enable privileges
- **Enable Password**— Enter the enable password for the enable user

Step 6 Click **Save**.

The information that you entered appears in the Password Attributes window.

Setting General Device Attributes

After you complete the device discovery process, the General Attributes - Devices window displays the current general attributes settings for each device.

Follow these steps to change the general attributes for a device:

Step 1 Click on the attribute that you want to change.

An Edit Attributes dialog box appears for the selected attribute.

Step 2 In the dialog box, indicate the new setting for the attribute.

The General Device attributes include the following:

- **Host Name**—Must begin with a letter, digit, or underscore followed by letters, digits, underscores, spaces, hyphens, or dots ending with a letter, digit, or underscore. This field is required and must match the name configured on the target router device. Limited to 256 characters.
- **Device Type**—The device type is the Cisco Router.
- **Device Description (not editable from this window)**—Can contain any pertinent information about the device, such as the type of device, its location, or other information that might be helpful to service provider operators. Limited to 80 characters.

- **Management Address**—Valid IP address of the device that ISC uses to configure the target router device. This IP address must be reachable from the ISC host.
- **Domain Name**—Must begin with a letter, digit, or underscore followed by letters, digits, underscores, spaces, hyphens, or dots ending with a letter, digit, or underscore. The name must match the domain name on the target router device.
- **Config Access Protocol**—Administers the access protocol for config upload and download. Choices include: Telnet, Terminal, TFTP, and RCP.

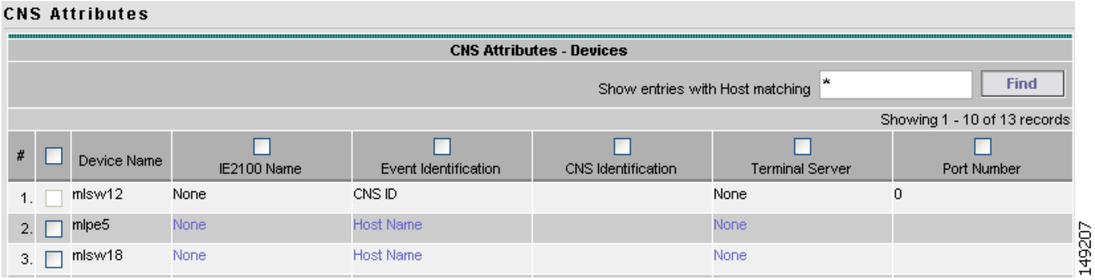
Setting Cisco CNS Attributes

If one of the devices is a Cisco CNS device, follow these steps to set CNS attributes:

Step 1 If the CNS Attributes window is not the current window, click the **Attributes** button and select **CNS Attributes** from the pull-down list.

Step 2 The CNS Attributes window appears, as shown in Figure 4-17.

Figure 4-17 CNS Attributes Window



CNS Attributes

CNS Attributes - Devices

Show entries with Host matching *

Showing 1 - 10 of 13 records

#	□	Device Name	□ IE2100 Name	□ Event Identification	□ CNS Identification	□ Terminal Server	□ Port Number
1.	□	mlsw12	None	CNS ID		None	0
2.	□	mlpe5	None	Host Name		None	
3.	□	mlsw18	None	Host Name		None	

The **Terminal Server** column specifies the devices that represent the workstations that can be used to provision edge routers, and the **Port Number** column specifies the port numbers used by the terminal server.

Step 3 Click an existing Event Identification item.

The Edit Attributes dialog box for Event Identification appears.

Step 4 From the drop-down list for Event Identification attribute, you can select **Event-Identification**, which indicates whether the CNS Identification field contains a HOST NAME or CNS ID. Default: HOST NAME.

Saving the Device Configuration

After you are finished making device configuration changes, click the **Continue** button.

The Device Discovery indicator turns green and indicates that Device Discovery is **Complete**.

The Discovery Data Collection phase begins automatically.

Step 3: Perform Discovery Data Collection

After you save your device configuration settings, the Discovery Data Collection phase of Device Discovery starts automatically.

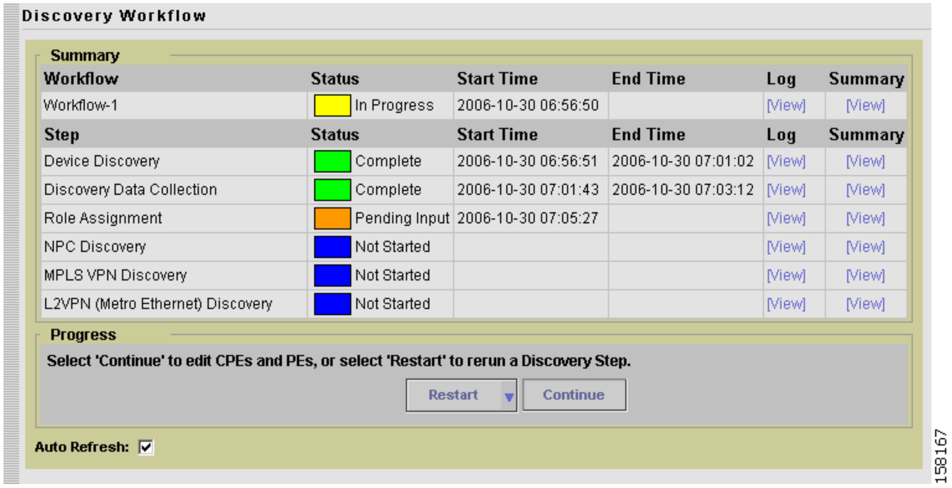
While Cisco IP Solution Center is collecting the device configurations, the Discovery Data Collection indicator is yellow and indicates that the process is **In Progress**.

When the Discovery Data Collection phase is complete, the indicator changes to green and indicates that the process is **Complete**. You are now ready to assign device roles.

Step 4: Perform Role Assignment

After the Discovery Data Collection phase of Device Discovery is complete, the Discovery Workflow window indicates that the Role Assignment phase is **Pending Input**, as shown in Figure 4-18.

Figure 4-18 Discovery Workflow with Role Collection Pending Input



Discovery Workflow

Summary

Workflow	Status	Start Time	End Time	Log	Summary
Workflow-1	🟨 In Progress	2006-10-30 06:56:50		[View]	[View]
Step	**Status**	**Start Time**	**End Time**	**Log**	**Summary**
Device Discovery	🟩 Complete	2006-10-30 06:56:51	2006-10-30 07:01:02	[View]	[View]
Discovery Data Collection	🟩 Complete	2006-10-30 07:01:43	2006-10-30 07:03:12	[View]	[View]
Role Assignment	🟧 Pending Input	2006-10-30 07:05:27		[View]	[View]
NPC Discovery	🟦 Not Started			[View]	[View]
MPLS VPN Discovery	🟦 Not Started			[View]	[View]
L2VPN (Metro Ethernet) Discovery	🟦 Not Started			[View]	[View]

Progress

Select 'Continue' to edit CPEs and PEs, or select 'Restart' to rerun a Discovery Step.

Auto Refresh: ☑

Restarting from Discovery Data Collection prompts you to select the devices for which discovery data collection needs to occur.

Follow these steps to assign device roles:

- Initiate Device Role Assignment
- Change the Device Assignment Display
- Change Device Assignments
- Determine Device Roles
- Assign CE Device Roles
- Assign PE Device Roles

The following sections describe each of these steps.

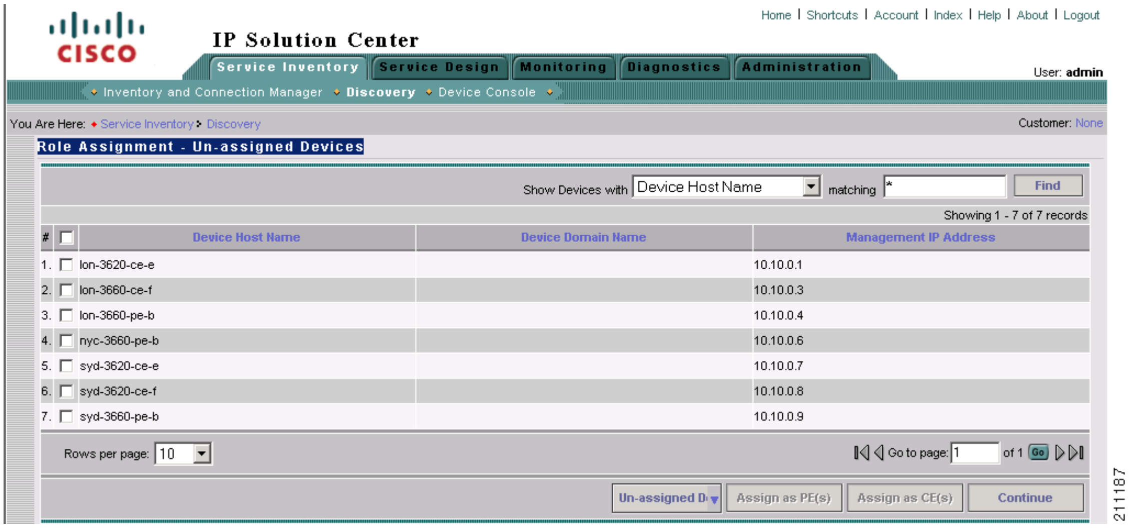
Initiating Device Role Assignment

Follow these steps to initiate device role assignment:

Step 1 In the Discovery Workflow window, click **Continue**.

The Role Assignment - Un-assigned Devices window appears, as shown in Figure 4-19.

Figure 4-19 Role Assignment - Un-assigned Devices Window



Role Assignment - Un-assigned Devices

Showing 1 - 7 of 7 records

#	☐	Device Host Name	Device Domain Name	Management IP Address
1.	☐	lon-3620-ce-e		10.10.0.1
2.	☐	lon-3660-ce-f		10.10.0.3
3.	☐	lon-3660-pe-b		10.10.0.4
4.	☐	nyc-3660-pe-b		10.10.0.6
5.	☐	syd-3620-ce-e		10.10.0.7
6.	☐	syd-3620-ce-f		10.10.0.8
7.	☐	syd-3660-pe-b		10.10.0.9

On the Role Assignment - Un-assigned Devices window, if you select a single device, you are prompted directly for the device role assignment. However, if you select more than one device, either the Role Assignment - CEs window or the Role Assignment - PEs window appears. On these windows you can specify the desired device roles.

Step 2 If you want to change the way that the devices are displayed, see the following section, Changing the Device Assignment Display, page 4-39.

Changing the Device Assignment Display

You can change the way devices are displayed in the Role Assignment window in the following ways:

- You can change the display to show unassigned devices, PE devices, or CE devices using the pull-down list at the bottom of the Role Assignment window.
- You can change the range of devices that are displayed using the **Show devices with** selection at the top of the window in combination with the **matching** field.

Follow these steps to change the category of devices that is displayed:

Step 1 To change the category of devices that is displayed, select a value from the pull-down list at the bottom of the Role Assignment window:

- To view PE devices, select **PEs**.
- To view CE devices, select **CEs**.
- To view unassigned devices, select **Un-assigned Devices**.

Step 2 To change the range of devices that are displayed, use the **Show devices with** selection at the top of the window in combination with the **matching** field.

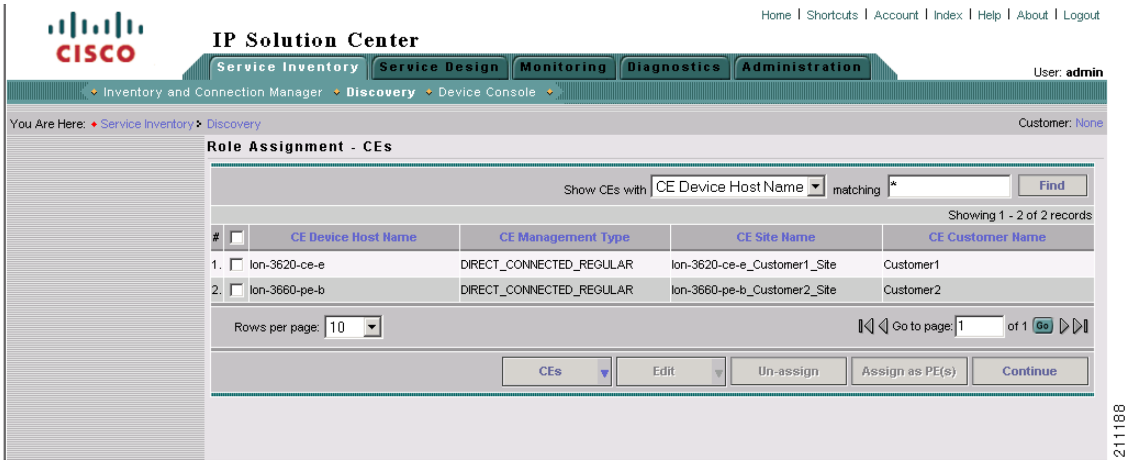
- To list devices by hostname, select **Device Host Name** and enter a search value in the matching field, then click **Find**.
- To list devices by domain name, select **Device Domain Name** name and enter a search value in the matching field, then click **Find**.
- To list devices by management IP address, select Management IP Address and enter a search value in the matching field, then click **Find**.

The value in the **matching** field specifies a search mask that controls which devices are displayed. An asterisk (*) specifies display of all devices by the selected search criteria. A string followed by an asterisk specifies display of all devices starting with part of a hostname, domain name, or management IP address. And a string preceded by an asterisk specifies display of all devices ending with part of a hostname, domain name, or management IP address.

You can specify more than one wildcard (asterisk) value in a search string. For example, to display all devices that have “ce” in the hostname, enter *ce* in the matching field.

The display changes depending on the selection that you made. For example, if two devices have been assigned the CE role, the Role Assignment - CEs window appears and shows a listing similar to the one in Figure 4-20.

Figure 4-20 Role Assignment - CEs Window



Role Assignment - CEs

Show CEs with CE Device Host Name matching * Find

Showing 1 - 2 of 2 records

#	□	CE Device Host Name	CE Management Type	CE Site Name	CE Customer Name
1.	□	lon-3620-ce-e	DIRECT_CONNECTED_REGULAR	lon-3620-ce-e_Customer1_Site	Customer1
2.	□	lon-3660-pe-b	DIRECT_CONNECTED_REGULAR	lon-3660-pe-b_Customer2_Site	Customer2

Rows per page: 10   Go to page: 1 of 1 Go

Changing Device Assignments

In some instances, the device discovery process assigns the wrong device role to groups of devices. For example, devices that should be PEs can be assigned as CEs.

If this occurs, perform these steps:

- If all the devices you expected would appear as PEs are not listed on the Role Assignment - PEs window, check the Role Assignment - Unassigned Devices window and the Role Assignment - CEs window and assign the devices as PE devices.
  - Go to the Role Assignment - CEs window and select any devices that should be PE devices
  - Click the **Assign as PEs** button

    The Role Assignment - PEs window appears and now lists the devices that you assigned as PEs.
- If other devices are not assigned as desired, change their basic device assignment as required.

Assigning Devices Individually or in Bulk

Using the windows provided for Role Assignment, you can assign device roles one device at a time or using bulk assignment (by selecting several devices and assigning them all the same role).

If you assign device roles for a single device, you can also assign the other device attributes, such as Site, Region, etc. However, if you assign device roles in bulk, then you cannot assign the other attributes at this time. You will have to go to the PEs or CEs window later to assign the other attributes.

Determine Device Roles

The purpose of device assignment is to categorize the devices discovered in the provider's network into two general groups:

- Provider-related devices—Provider Edge (PE) devices.

  See Assigning the PE Role, page 4-41 for instructions on assigning the PE roles (U-PE, N-PE, P, or PE-AGG).

- Customer-related devices—Customer Edge (CE) devices

  See Assigning the CE Role, page 4-44 for instructions on assigning the CE role.

For PE devices, use the following guidelines to determine device roles:

- Assign a device that is at the center of a core domain as a P device.
- Assign any devices that interface with users of the VPN services as U-PE devices. These are devices that are on the customer facing edge of a domain.
- Assign any devices that are on the edge of the MPLS core domain or L2VPN core domain as N-PE devices.
- Assign any devices that are in device rings or which connect to multiple U-PE devices as PE-AGG devices.

  For CE devices, see the descriptions of the CE roles in the section on assigning CE roles (Assigning the CE Role, page 4-44) for specific information.

Assigning the PE Role

Follow these steps to assign a device as a PE device:

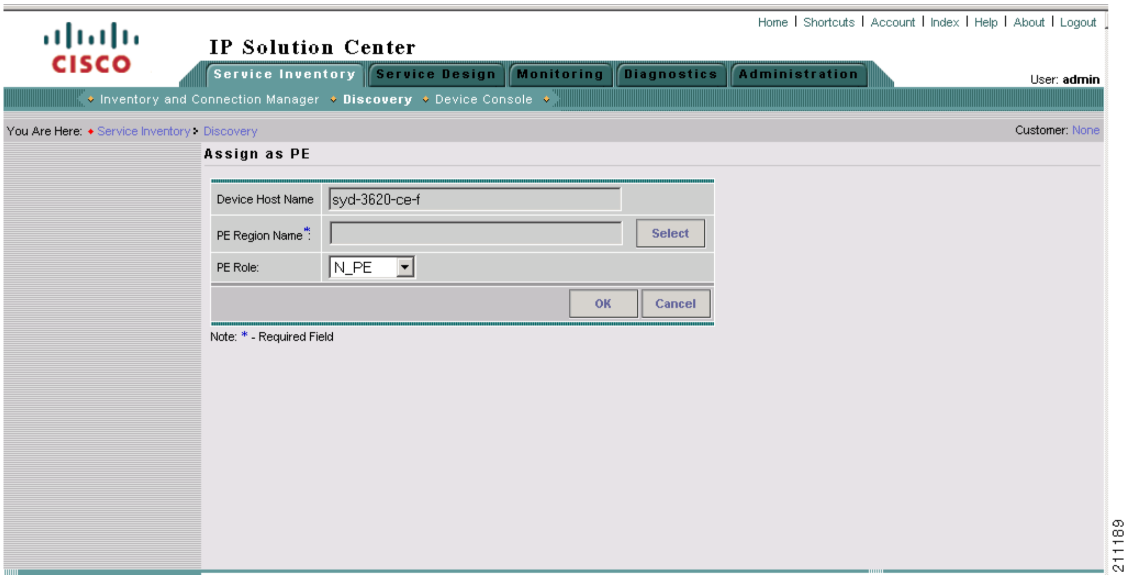
Step 1 In the Role Assignment - Un-assigned Devices window, select a device that you want to assign as a PE.

- To select a device, check the check box next to the device name.
- To deselect a device, uncheck the check box next to the device name.

Step 2 Click the **Assign as PE(s)** button.

The Assign as PE window appears, as shown in Figure 4-21.

Figure 4-21 Assign as PE Window



Assign as PE

Device Host Name: syd-3620-ce-f

PE Region Name*:

PE Role: N_PE

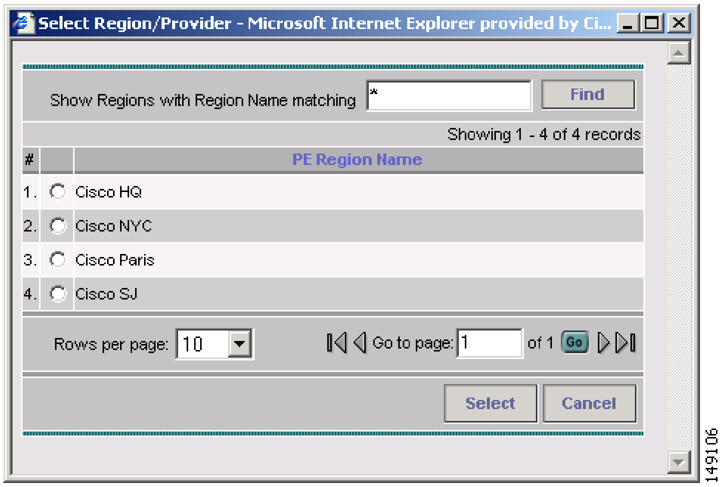
Note: * - Required Field

Step 3 In the Assign as PE window, assign the required information for the PE.

a. To assign a PE Region Name, click the **Select** button.

The PE Region Name window appears, as shown in Figure 4-22.

Figure 4-22 PE Region Name Window


Select Region/Provider - Microsoft Internet Explorer provided by Ci...
Find
Rows per page:
Go to page:
of 1
Go
Select
Cancel
149106

Show Regions with Region Name matching: *

Showing 1 - 4 of 4 records

#		PE Region Name
1.	○	Cisco HQ
2.	○	Cisco NYC
3.	○	Cisco Paris
4.	○	Cisco SJ

Rows per page: 10 Go to page: 1 of 1

b. In the PE Region Name window, click the radio button next to the region name that you want to assign and then click **Select**.

The Assign as PE window appears with the region name in the PE Region field.

c. To assign a PE role, select a value from the pull-down list for the PE Role field.

The PE role specifies the architectural role that a PE router performs. Assign the PE role based on the network layer to which the device belongs.

You can select the following PE roles:

- **N-PE**—Assign devices that are at the edge of domains (within the Edge layer) as Network Facing Provider Edge (N-PE) devices.
- **U-PE**—Assign devices within the User Facing Provider Edge as U-PE devices.
- **P**—Assign a device that is at the center of a core domain as a Provider Core (P) device.
- **PE-AGG**—Assign devices within the Aggregation Layer as Provider Edge Aggregation (PE-AGG) devices.

d. Click **OK**.

The Role Assignment - PEs window appears with the specified values shown.

Editing the PE Role

After you have assigned one or more devices as PE devices and they appear in the Role Assignment - PEs window, you can edit the PE role. You can edit the PE role even if no values have been assigned in the Assign as PE window.

Note PE role assignment is not mandatory. However, it is recommended to avoid unexpected behavior.

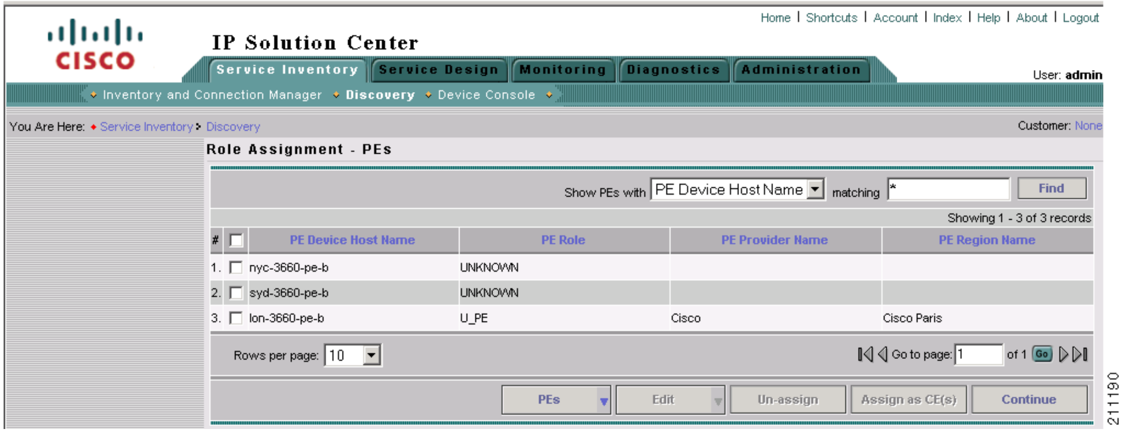
Follow these steps to edit the Role Assignment values for a PE device:

Step 1 While the Role Assignment phase of Device Discovery is active, choose the Role Assignment - PEs window.

If the Role Assignment - Un-assigned Devices or the Role Assignment - CEs window is active, select **Role-Assignment - PEs** from the pull-down list at the bottom of the window.

The Role Assignment - PEs window appears, as shown in Figure 4-23.

Figure 4-23 Role Assignment - PEs Window



Role Assignment - PEs

Show PEs with PE Device Host Name matching *

Showing 1 - 3 of 3 records

#	□	PE Device Host Name	PE Role	PE Provider Name	PE Region Name
1.	□	nyc-3660-pe-b	UNKNOWN		
2.	□	syd-3660-pe-b	UNKNOWN		
3.	□	lon-3660-pe-b	U_PE	Cisco	Cisco Paris

Rows per page: 10   Go to page: 1 of 1

Note that on this window, sorting is disabled for the following columns:

- PE Device Host Name

- PE Provider Name
- PE Region Name.

In the sample window shown in Figure 4-23, one of the PEs has role information assigned. The other two PEs have been assigned as PEs but do not have role information assigned. You can edit any of the information for the PEs, whether information has been entered or not.

Step 2 Select one or more PEs to edit.

- To select a specific PE, check the check box next to the device name.
- To select all the PEs shown in the window, check the check box in the heading row.

Step 3 To edit the PE role, follow these steps:

a. Click the **Edit** button at the bottom of the window and choose **PE Role** from the pull-down list.

   You are prompted to select a PE role.

b. Select a value from the pull-down list for the PE Role field.

   You can select the following PE roles:

   – **N-PE**—Assign devices within the Edge layer as Network Facing Provider Edge (N-PE) devices.
   – **U-PE**—Assign devices within the User Facing Provider Edge as U-PE devices.
   – **P**—Assign devices within the Core layer as Provider Core (P) devices.
   – **PE-AGG**—Assign devices within the Aggregation Layer as Provider Edge Aggregation (PE-AGG) devices.

The specified PE role appears in the Role Assignment - PEs window.

Step 4 To edit the PE provider name or PE region name, follow these steps:

a. Click the **Edit** button at the bottom of the window and choose **Region/Provider** from the pull-down list.

   You are prompted for a Region name.

b. Click the radio button next to one of the region names listed in the pop-up window and then click the **Select** button.

The specified Region Name and its associated Provider Name appear in the Role Assignment - PEs window.

Assigning the CE Role

Follow these steps to assign a device as a CE device:

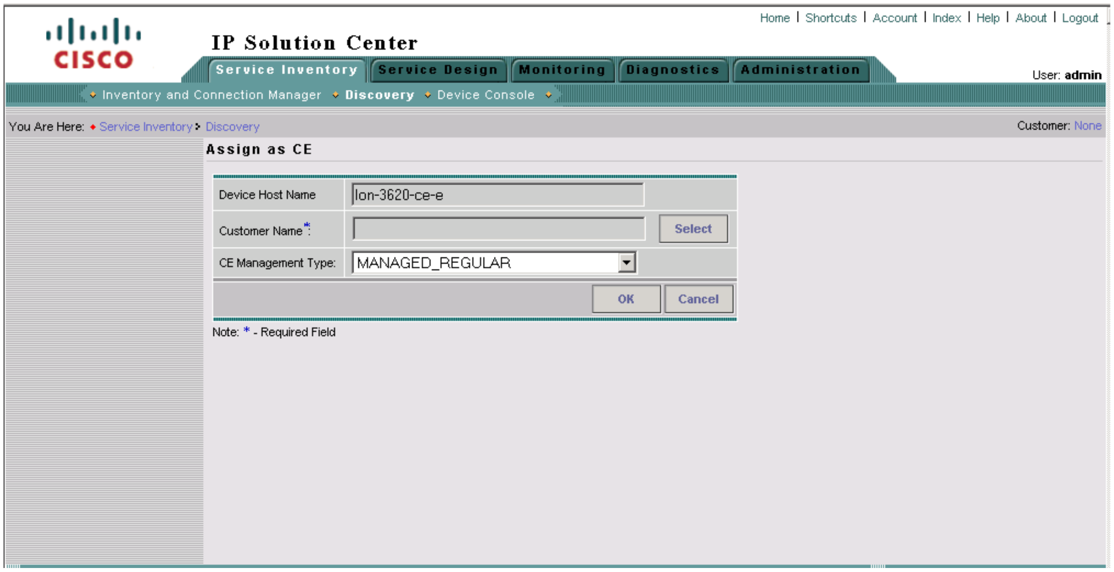
Step 1 In the Role Assignment - Un-assigned Devices window, select a device that you want to assign as a CE.

- To select a device, check the check box next to the device name.
- To deselect a device, uncheck the check box next to the device name.

Step 2 Click the **Assign as CE(s)** button.

Step 3 The Assign as CE window appears, as shown in Figure 4-24.

Figure 4-24 Assign as CE Window



Device Host Name	lon-3620-ce-e
Customer Name*:	
CE Management Type:	MANAGED_REGULAR

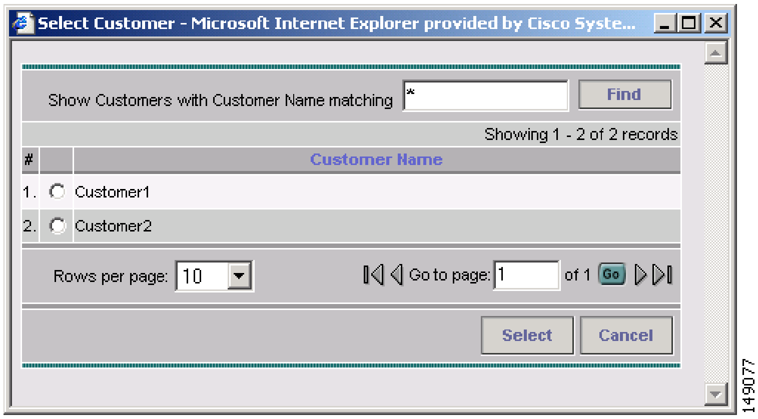
Note: * - Required Field

Step 4 In the Assign as CE window, assign the required information for the CE.

a. To assign a Customer Name (required field), click the **Select** button.

The Customer Name window appears, as shown in Figure 4-25.

Figure 4-25 Customer Name Window



Select Customer - Microsoft Internet Explorer provided by Cisco Syste...
Show Customers with Customer Name matching
Find
Rows per page: 10
Go to page: 1 of 1
Go
Select
Cancel
149077

Show Customers with Customer Name matching: *

Showing 1 - 2 of 2 records

#		Customer Name
1.	○	Customer1
2.	○	Customer2

b. To assign a customer name, click the radio button next to the customer name that you want to assign and then click the **Select** button.

The Assign as CE window appears with the specified customer name displayed.

c. To assign a CE management type, select a value from the pull-down list for the CE Management Type.

The CE Management type specifies the architectural role that a CE router performs. Assign the CE management type based on the network layer to which the device belongs.

You can select the following CE management types:

- **MANAGED-REGULAR—**This is the default CE role assignment. Assign this role to CEs that you want the Provider to manage. The CE must be reachable from an ISC server. When you assign this role, then when you create a router in the Inventory Manager interface, the router configuration is automatically downloaded.
- **UNMANAGED—**Assign this role to a device that you want to manage manually. If this role is assigned, then the device configuration is not assigned automatically when a new device is created and the device must be configured manually. An unmanaged CE cannot be provisioned directly by the provider. If Unmanaged is selected, the provider can use ISC to generate a configuration, and then send the configuration to the customer for placement on the CE.
- **MANAGED-MGMT-LAN—**Specifies that the device management is linked to the PE configuration. The configuration is downloaded automatically when a new device is created. A managed Management LAN or Management CE (MCE) is configured like a managed CE router, but it resides in the provider space. Normally, an MCE acts as the network operations center (NOC) gateway router.
- **UNMANAGED-MGMT-LAN—**Specifies that the device management is linked to the PE configuration, but the configuration is not downloaded automatically when a new device is created. An unmanaged Management LAN or MCE is configured like an unmanaged CE router, but it resides in the provider space. Normally, an MCE acts as the network operations center (NOC) gateway router.
- **DIRECT-CONNECTED-REGULAR—**In most cases, the CE is connected to a PE router. In this case, the CE is connected to a workstation or other device.
- **DIRECT-CONNECTED-MGMT-HOST—**In most cases, the CE is connected to a PE router. In this case, the CE is connected to a workstation or other device on which ISC resides.
- **MULTI-VRF—**Specifies that there is a device between the PE and the CE that is a VPN routing/forwarding instance (VRF). A multi-VRF CE (MVRFCE) is owned by the customer, but resides in the provider space. It is used to off-load traffic from the PE.
- **UNMANAGED-MULTI-VRF—**An unmanaged multi-VRF CE is provisioned like an unmanaged CE (configurations are not uploaded or downloaded to the device by the provider). It is owned by the customer and resides in the provider space.

d. Click **OK**.

The Role Assignment - CEs window appears with the specified values shown.

Note The CE Site value is unassigned at this point. To assign this value, you must edit the settings. See Editing the CE Role, page 4-46 for instructions on this task.

Editing the CE Role

After you have assigned one or more devices as CE devices and they appear in the Role Assignment - CEs window, you can edit the CE role. You can edit the CE role even if no values have been assigned in the Assign as CE window.

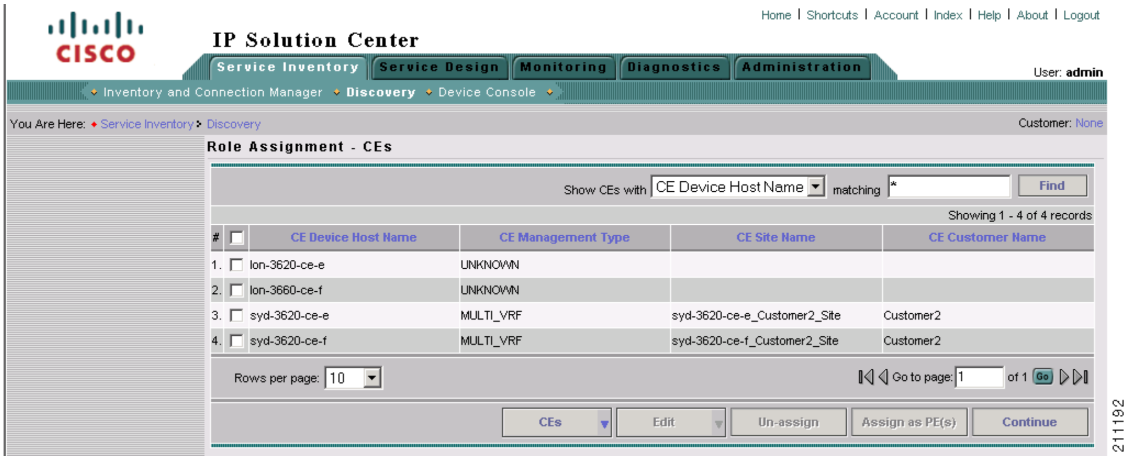
Follow these steps to edit the Role Assignment values for a CE device:

Step 1 While the Role Assignment phase of Device Discovery is active, choose the Role Assignment - CEs window.

If the Role Assignment - Un-assigned Devices or the Role Assignment - PE window is active, select **Role-Assignment - CEs** from the pull-down list at the bottom of the window.

The Role Assignment - CEs window appears, as shown in Figure 4-26.

Figure 4-26 Role Assignment - CEs Window



Role Assignment - CEs

Show CEs with CE Device Host Name matching *

Showing 1 - 4 of 4 records

#	□	CE Device Host Name	CE Management Type	CE Site Name	CE Customer Name
1.	□	lon-3620-ce-e	UNKNOWN		
2.	□	lon-3660-ce-f	UNKNOWN		
3.	□	syd-3620-ce-e	MULTI_VRF	syd-3620-ce-e_Customer2_Site	Customer2
4.	□	syd-3620-ce-f	MULTI_VRF	syd-3620-ce-f_Customer2_Site	Customer2

Rows per page: 10

Go to page: 1 of 1

In the sample Role Assignment - CEs window shown in Figure 4-26, two of the CEs have role assignment information assigned, and two have no information assigned. You can edit any of the information for the CEs, whether information has been entered or not.

Note that on this window, sorting is disabled on the following columns:

- CE Device Host Name
- CE Site Name
- CE Customer Name

Step 2 Select one or more CEs to edit.

- To select a specific CE, check the check box next to the device name.
- To select all the CEs shown in the window, check the check box in the heading row.

Step 3 To edit the Customer name, follow these steps:

a. Click the **Edit** button at the bottom of the window and choose **Customer** from the pull-down list.

You are prompted to select a customer name.

b. To select a customer name, click the radio button next to one of the customer names that is displayed, and then click the **Select** button.

The Role Assignment - CEs window appears with the specified customer name displayed.

Step 4 To edit the CE management type, follow these steps:

a. Select one or more CEs to edit.

b. Click the **Edit** button at the bottom of the window and choose **CE Management Type** from the pull-down window.

The CE Management type specifies the architectural role that a CE router performs. Assign the CE management type based on the network layer to which the device belongs.

You can select the following CE management types:

- **MANAGED-REGULAR—**This is the default CE role assignment. Assign this role to CEs that you want the Provider to manage. The CE must be reachable from an ISC server. When you assign this role, then when you create a router in the Inventory Manager interface, the router configuration is automatically downloaded.
- **UNMANAGED—**Assign this role to a device that you want to manage manually. If this role is assigned, then the device configuration is not assigned automatically when a new device is created and the device must be configured manually. An unmanaged CE cannot be provisioned directly by the provider. If Unmanaged is selected, the provider can use ISC to generate a configuration, and then send the configuration to the customer for placement on the CE.
- **MANAGED-MGMT-LAN—**Specifies that the device management is linked to the PE configuration. The configuration is downloaded automatically when a new device is created. A managed Management LAN or Management CE (MCE) is configured like a managed CE router, but it resides in the provider space. Normally, an MCE acts as the network operations center (NOC) gateway router.
- **UNMANAGED-MGMT-LAN—**Specifies that the device management is linked to the PE configuration, but the configuration is not downloaded automatically when a new device is created. An unmanaged Management LAN or MCE is configured like an unmanaged CE router, but it resides in the provider space. Normally, an MCE acts as the network operations center (NOC) gateway router.
- **DIRECT-CONNECTED-REGULAR—**In most cases, the CE is connected to a PE router. In this case, the CE is connected to a workstation or other device.
- **DIRECT-CONNECTED-MGMT-HOST—**In most cases, the CE is connected to a PE router. In this case, the CE is connected to a workstation or other device on which ISC resides.
- **MULTI-VRF—**Specifies that there is a device between the PE and the CE that is a VPN routing/forwarding instance (VRF). A multi-VRF CE (MVRFCE) is owned by the customer, but resides in the provider space. It is used to off-load traffic from the PE.
- **UNMANAGED-MULTI-VRF—**An unmanaged multi-VRF CE is provisioned like an unmanaged CE (configurations are not uploaded or downloaded to the device by the provider). It is owned by the customer and resides in the provider space.

c. Click **Select**.

The Role Assignment - CEs window appears with the specified CE management type displayed.

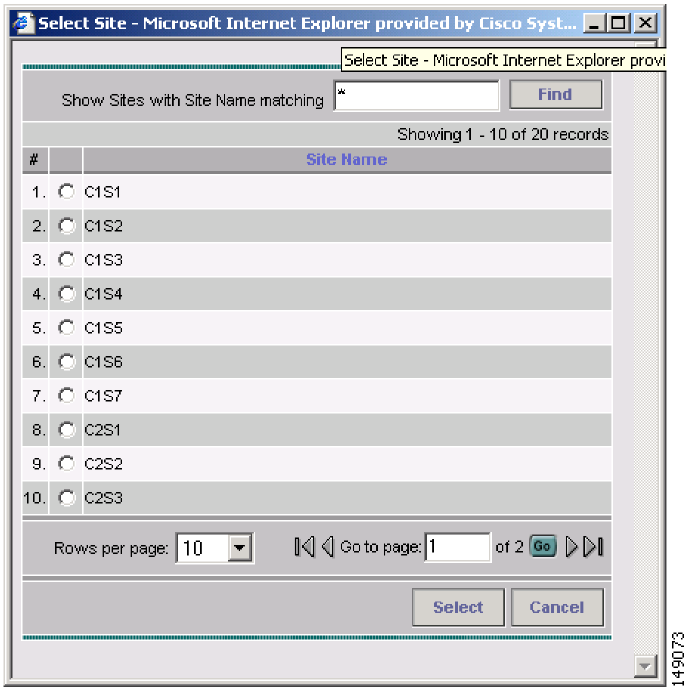
Step 5 To specify a site name or edit an existing site name, follow these steps:

a. Select one or more CEs to edit.

b. Click the **Edit** button at the bottom of the window and choose **Site** from the pull-down window.

The Site Name window appears, as shown in Figure 4-27.

Figure 4-27 Site Name Window



Select Site - Microsoft Internet Explorer provided by Cisco Syst...

Show Sites with Site Name matching: *

Showing 1 - 10 of 20 records

#		Site Name
1.	○	C1S1
2.	○	C1S2
3.	○	C1S3
4.	○	C1S4
5.	○	C1S5
6.	○	C1S6
7.	○	C1S7
8.	○	C2S1
9.	○	C2S2
10.	○	C2S3

Rows per page: 10

Go to page: 1 of 2

c. In the Site Name window, click the radio button next to the site name that you want to assign and then click the **Select** button.

The Role Assignment - CEs window appears with the specified site names displayed.

Saving the Role Assignment Information

After you finish assigning roles to the devices, click the **Continue** button.

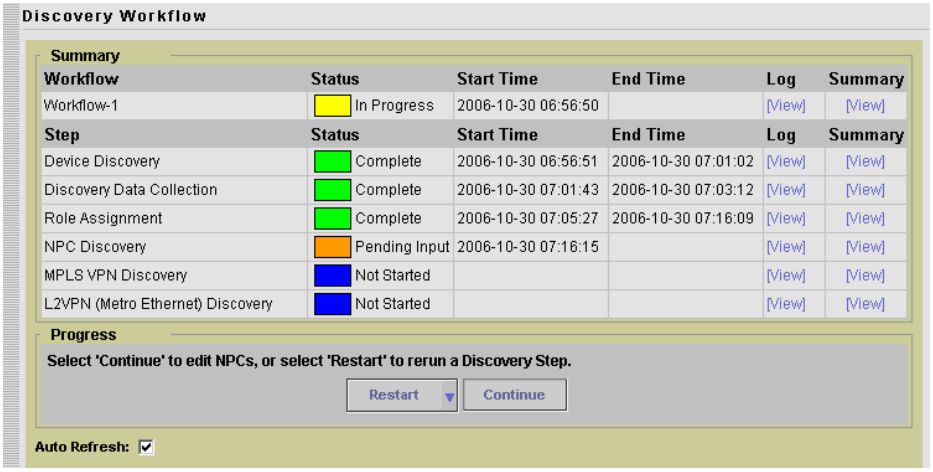
The Role Assignment Discovery indicator turns green and indicates that Role Assignment is **Complete**.

You are now ready to start the NPC Discovery phase of Device Discovery.

Step 5: Perform NPC Discovery

After the Role Assignment phase of Device Discovery is complete, the Discovery Workflow window indicates that the NPC Discovery phase is **Pending Input**, as shown in Figure 4-28.

Figure 4-28 Discovery Workflow with NPC Discovery Pending Input



Discovery Workflow

Summary

Workflow	Status	Start Time	End Time	Log	Summary
Workflow-1	🟨 In Progress	2006-10-30 06:56:50		[View]	[View]

Step	Status	Start Time	End Time	Log	Summary
Device Discovery	🟩 Complete	2006-10-30 06:56:51	2006-10-30 07:01:02	[View]	[View]
Discovery Data Collection	🟩 Complete	2006-10-30 07:01:43	2006-10-30 07:03:12	[View]	[View]
Role Assignment	🟩 Complete	2006-10-30 07:05:27	2006-10-30 07:16:09	[View]	[View]
NPC Discovery	🟧 Pending Input	2006-10-30 07:16:15		[View]	[View]
MPLS VPN Discovery	🟦 Not Started			[View]	[View]
L2VPN (Metro Ethernet) Discovery	🟦 Not Started			[View]	[View]

Progress

Select 'Continue' to edit NPCs, or select 'Restart' to rerun a Discovery Step.

Auto Refresh: ☑

158168

Follow these general steps to view a list of the NPCs that have been discovered and add or remove NPCs as required:

- If you are discovering *a Metro Ethernet topology with an Ethernet core*, perform the steps described in Preliminary Steps Before Completing NPC Discovery for Metro Ethernet Networks, page 4-50.
- Complete the steps for starting NPC assignment as described in Starting NPC Assignment, page 4-52
- If necessary, complete steps for adding or modifying NPCs as described in Adding a Device for an NPC, page 4-54 and the sections that follow.

Preliminary Steps Before Completing NPC Discovery for Metro Ethernet Networks

Follow these steps if you are discovering a Metro Ethernet topology with an Ethernet core.

- Create one or more Access Domains and assign the devices that were discovered in the Device Discovery phase to the Access Domain(s).
- Create at least one Resource Pool.
- Edit the "inter N-PE interface" for each device.

These steps are performed using the Inventory and Connection Manager in the Service Inventory interface (**Service Inventory > Inventory and Connection Manager**).

Create Access Domains

Follow these steps to create access domains and add discovered devices to the domains:

Step 1 In the ISC start page, select **Service Inventory**.

Step 2 In the Service Inventory window, select **Inventory and Connection Manager**.

The Inventory and Service manager window appears.

Step 3 In the left area of the window, select **Access Domains**.

The Access Domains window appears.

Step 4 Create one or more Access Domains and assign the devices in the L2VPN Metro Ethernet topology to these Access Domains.

For detailed instructions on creating Access Domains, see the "Creating Access Domains" section on page 3-125.

Create Resource Pools

Follow these steps to create a resource pool:

Step 1 In the ISC start page, select **Service Inventory**.

Step 2 In the Service Inventory window, select **Inventory and Connection Manager**.

The Inventory and Service manager window appears.

Step 3 In the left area of the window, select **Resource Pools**.

The Resource Pools window appears.

Step 4 Create a Resource Pools.

Step 5 For the **Pool Type**, make sure that you select **VLAN**.

Step 6 For the **Start** value, enter 2.

Step 7 For the **Pool Size** value, enter a value large enough to accommodate the number of devices in the resource pool, for example, 500.

For detailed instructions on creating Resource Pools, see the "Resource Pools" section on page 3-126.

Edit Inter-N-PE Interfaces

Follow these steps to edit the "Inter N-PE" interfaces for the devices in your Metro Ethernet topology:

Note These steps are only required if the PE devices already exist in the repository.

Step 1 In the ISC start page, select **Service Inventory**.

Step 2 In the Service Inventory window, select **Inventory and Connection Manager**.

The Inventory and Service manager window appears.

Step 3 In the left area of the window, select **PE Devices**.

The PE Devices window appears.

Step 4 Select each PE device in your topology and do the following:

a. Click the **Edit** button

The Edit PE window appears.

b. Locate the interface that connects to each device that the device is connected to.

c. For each interface, in the Metro Ethernet column, change **Any** to **None**.

d. Save your changes

Go the following section, Starting NPC Assignment, page 4-52 and follow the steps for starting NPC assignment.

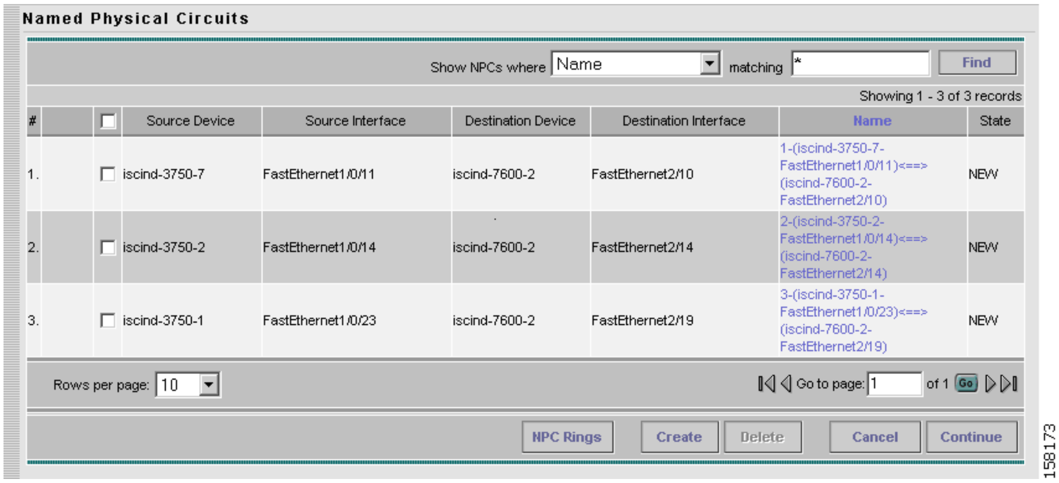
Starting NPC Assignment

Follow these steps to initiate NPC assignment:

Step 1 In the Discovery Workflow window, click **Continue**.

The Named Physical Circuits window appears, as shown in Figure 4-29.

Figure 4-29 Named Physical Circuits Window



Named Physical Circuits

Show NPCs where Name matching *

Showing 1 - 3 of 3 records

#		□	Source Device	Source Interface	Destination Device	Destination Interface	Name	State
1.		□	iscind-3750-7	FastEthernet1/0/11	iscind-7600-2	FastEthernet2/10	1-(iscind-3750-7-FastEthernet1/0/11)<==>(iscind-7600-2-FastEthernet2/10)	NEW
2.		□	iscind-3750-2	FastEthernet1/0/14	iscind-7600-2	FastEthernet2/14	2-(iscind-3750-2-FastEthernet1/0/14)<==>(iscind-7600-2-FastEthernet2/14)	NEW
3.		□	iscind-3750-1	FastEthernet1/0/23	iscind-7600-2	FastEthernet2/19	3-(iscind-3750-1-FastEthernet1/0/23)<==>(iscind-7600-2-FastEthernet2/19)	NEW

Rows per page: 10

Go to page: 1 of 1

The Named Physical Circuits window initially displays any discovered circuits.

At this point, you can create, add, or remove NPCs as required.

The State column has the following categories:

- **New**—No corresponding NPC exists in ISC. Only the New NPCs are committed to ISC.
- **Existing**—The discovered NPC is the same as the NPC in ISC.

- **Existing Modified** —The NPC in ISC has the same source and endpoint but one or more of the intermediate links might not be the same.
- **Conflicting**—The discovered NPC conflicts with the NPC in ISC.

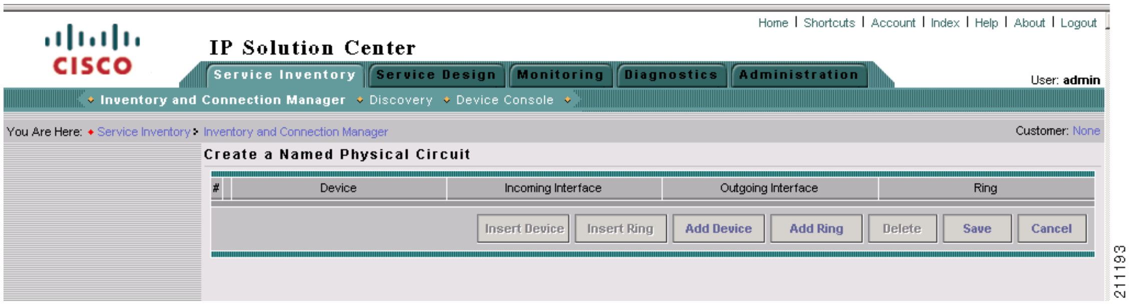
Named physical circuits (NPCs) are named circuits that describe a physical connection between a CPE or U-PE and a N-PE. The intermediate nodes of the NPCs can either be U-PE or PE-AGG. They can be connected in a circular fashion forming a ring of devices, which is represented by an entity known as NPC Rings. NPC Rings represent the circular topology between devices to the Named Physical Circuits. To create an NPC, you must specify how the source CPE/U-PE and the destination N-PE are connected and specify the intermediate nodes.

Step 2 If you need to define an NPC, follow these steps:

a. In the Named Physical Circuits window, click **Create**.

The Create a Physical Circuit window appears, as shown in Figure 4-30.

Figure 4-30 Create Physical Circuits Window.



Create a Named Physical Circuit

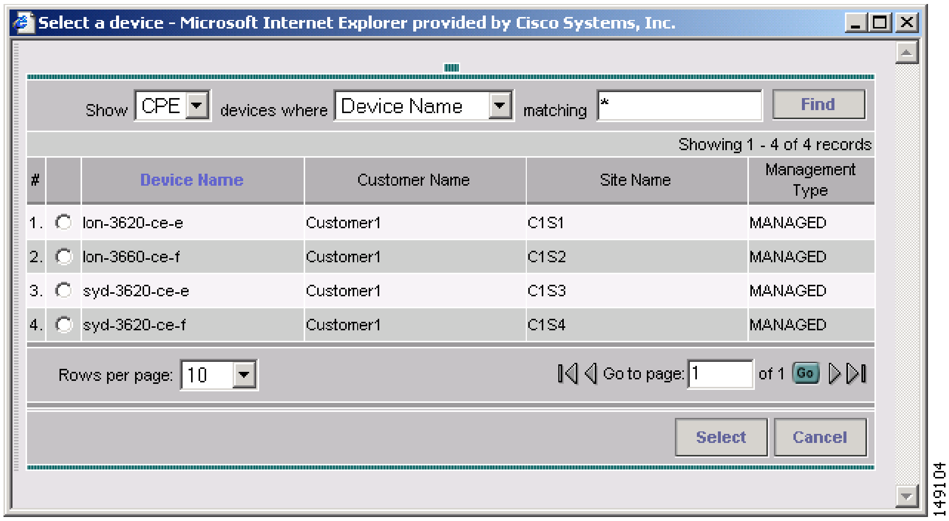
#	Device	Incoming Interface	Outgoing Interface	Ring

Initially, the list of NPCs is empty.

b. Click the **Add Device** button

The Select a Device window appears, as shown in Figure 4-31.

Figure 4-31 Select a Device Window


Select a device - Microsoft Internet Explorer provided by Cisco Systems, Inc.
Find
Select
Cancel
149104

Show CPE devices where Device Name matching *

Showing 1 - 4 of 4 records

#		Device Name	Customer Name	Site Name	Management Type
1.	○	lon-3620-ce-e	Customer1	C1S1	MANAGED
2.	○	lon-3660-ce-f	Customer1	C1S2	MANAGED
3.	○	syd-3620-ce-e	Customer1	C1S3	MANAGED
4.	○	syd-3620-ce-f	Customer1	C1S4	MANAGED

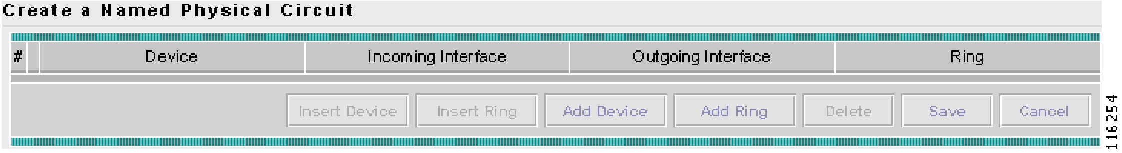
Rows per page: 10

Go to page: 1 of 1 Go

Step 3 In this window, click the radio button for a device and then click the **Select** button.

The Create a Named Physical Circuit window appears with an initial device added, as shown in Figure 4-32.

Figure 4-32 Create a Named Physical Circuit Window with Initial Device Added



Create a Named Physical Circuit

#	Device	Incoming Interface	Outgoing Interface	Ring

The buttons on the window are now active.

c. Click a device that appears in the screen and then select one of the following actions:

- To insert a device, click the **Insert Device** button.
- To insert a ring, click the **Insert Ring** button.
- To add a device, click the **Add Device** button.
- To add a ring, click the **Add Ring** button.
- To delete an existing device or ring, select a device and then click the **Delete** button.

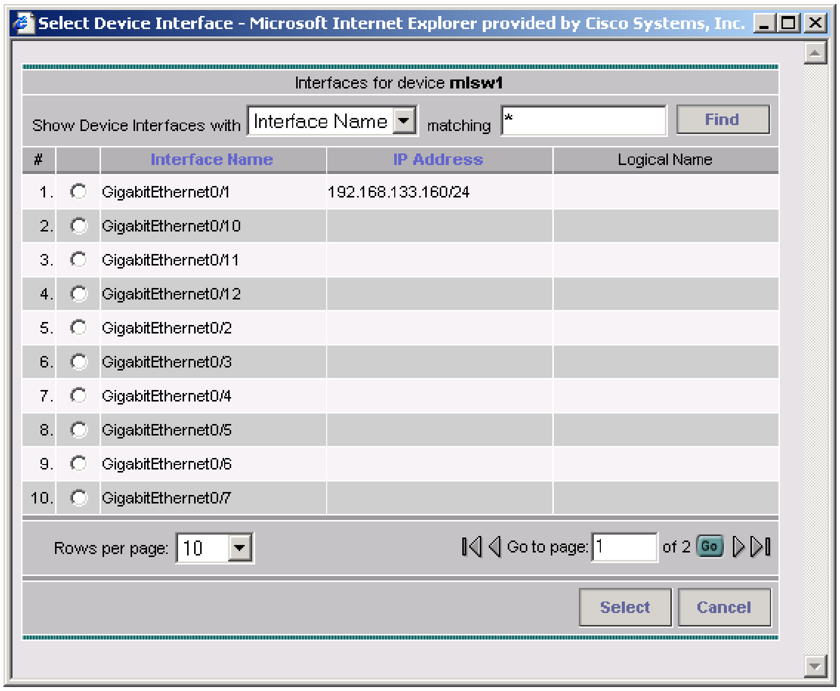
Step 4 Refer to the following sections for additional information.

Adding a Device for an NPC

Step 1 To select an incoming interface on the Create a Named Physical Circuit window click on **Select Incoming Interface**.

The Select Device Interface window appears, as shown in Figure 4-33.

Figure 4-33 Select Device Interface Window



Select Device Interface - Microsoft Internet Explorer provided by Cisco Systems, Inc.

Interfaces for device **mlsw1**

Show Device Interfaces with: Interface Name matching: *

#		Interface Name	IP Address	Logical Name
1.	○	GigabitEthernet0/1	192.168.133.160/24	
2.	○	GigabitEthernet0/10		
3.	○	GigabitEthernet0/11		
4.	○	GigabitEthernet0/12		
5.	○	GigabitEthernet0/2		
6.	○	GigabitEthernet0/3		
7.	○	GigabitEthernet0/4		
8.	○	GigabitEthernet0/5		
9.	○	GigabitEthernet0/6		
10.	○	GigabitEthernet0/7		

Rows per page: 10

Go to page: 1 of 2

This window shows the interfaces on the selected device.

Step 2 Click the radio button next to an interface in the list and then click the **Select** button.

The selected interface now appears in the Create a Named Physical Circuit window.

Step 3 To select an outgoing interface, click on **Select Outgoing Interface**.

A list of interfaces configured on the device appears

Step 4 Click the radio button next to an interface in the list and then click the **Select** button.

The outgoing interface now appears in the Create a Named Physical Circuit window.

Step 5 Select additional devices as required and specify incoming and/or outgoing interfaces.

Step 6 After you are finished, click the **Save** button in the Create a Named Physical Circuit window.

Adding a Ring

Follow these steps to add a ring before the currently selected device:

Note Incremental service discovery of rings is not supported.

Step 1 In the Create a Named Physical Circuit window, click **Add Ring**.

The Select NPC Rings window appears. This window shows any rings that exist in the network topology.

Step 2 Click the radio button next to a ring listed in the window and then click the **Select** button.

The selected ring now appears in the Create a Named Physical Circuit window.

Inserting a Device

To insert a device after the last device in the topology, follow these steps:

Step 1 In the Create a Named Physical Circuit window, click the **Insert Device** button.

The Select a Device window appears, as shown in Figure 4-31.

Step 2 Check the check box next to a device that you want to insert and then click the **Select** button.

The device now appears on the Create a Named Physical Circuit window.

Step 3 Click **select incoming interface**.

A list of interfaces on the selected device appears.

Step 4 Check the check box next to the interface that you want to choose and then click **Select**.

The selected interface now appears on the list of interfaces.

Inserting a Ring

To insert a ring after the last device in the topology, follow these steps:

Step 1 In the Create a Named Physical Circuit window, click the **Insert Ring** button.

A list of the currently existing rings appears.

Step 2 In the list of rings, check the check box next to the ring that you want to insert and then click **Select**.

The selected ring now appears on the Create a Named Physical Circuit window.

Deleting a Device or a Ring

Follow these steps to delete a device or a ring:

Step 1 In the Create a Named Physical Circuit window, select a device or ring and then click the **Delete** button.

The create NPC window appears with the device deleted.

Saving the NPC Configuration

After you have selected two devices and have configured the connection between them, follow these steps to save the NPC configuration:

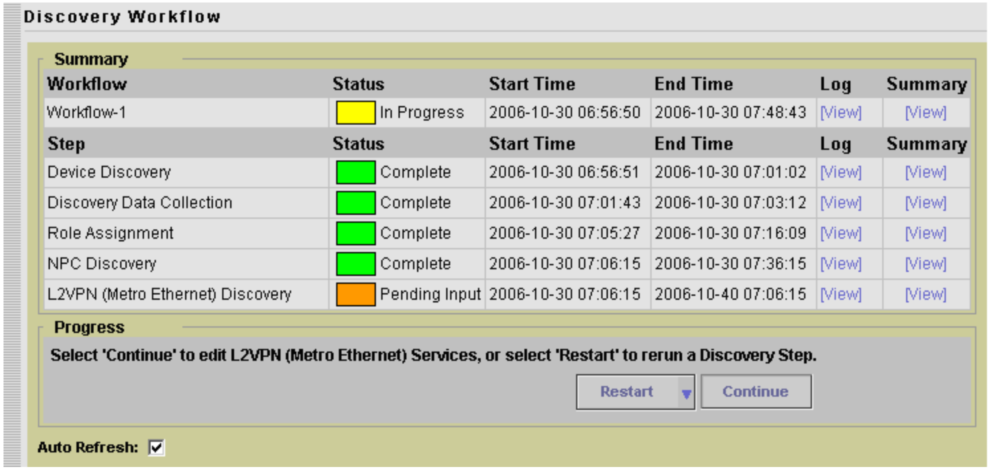
Step 1 In the Create a Named Physical Circuit window, click **Save**.

The NPC process validates the NPC configuration.

Step 2 Click **Continue** to continue.

The workflow window appears with NPC discovery marked as completed, as shown in Figure 4-34.

Figure 4-34 NPC Complete Window



Discovery Workflow

Summary

Workflow	Status	Start Time	End Time	Log	Summary
Workflow-1	🟨 In Progress	2006-10-30 06:56:50	2006-10-30 07:48:43	[View]	[View]
Step	**Status**	**Start Time**	**End Time**	**Log**	**Summary**
Device Discovery	🟩 Complete	2006-10-30 06:56:51	2006-10-30 07:01:02	[View]	[View]
Discovery Data Collection	🟩 Complete	2006-10-30 07:01:43	2006-10-30 07:03:12	[View]	[View]
Role Assignment	🟩 Complete	2006-10-30 07:05:27	2006-10-30 07:16:09	[View]	[View]
NPC Discovery	🟩 Complete	2006-10-30 07:06:15	2006-10-30 07:36:15	[View]	[View]
L2VPN (Metro Ethernet) Discovery	🟧 Pending Input	2006-10-30 07:06:15	2006-10-40 07:06:15	[View]	[View]

Progress

Select 'Continue' to edit L2VPN (Metro Ethernet) Services, or select 'Restart' to rerun a Discovery Step.

Step 6: Perform MPLS VPN Service Discovery (Optional)

After you have completed the NPC Discovery phase of Device discovery, if you selected **MPLS VPN Discovery** when you initiated the Discovery process, the NPC Discovery phase is marked as complete, and the MPLS VPN Discovery step is marked as **Pending Input**.

You are now ready to initiate configuration of the discovered MPLS VPN using the MPLS VPN Discovery user interface. Follow these steps to configure MPLS VPN services:

Note MPLS service discovery does not support devices running IOS XR.

Step 1 In the Discovery Workflow window, click **Continue**.

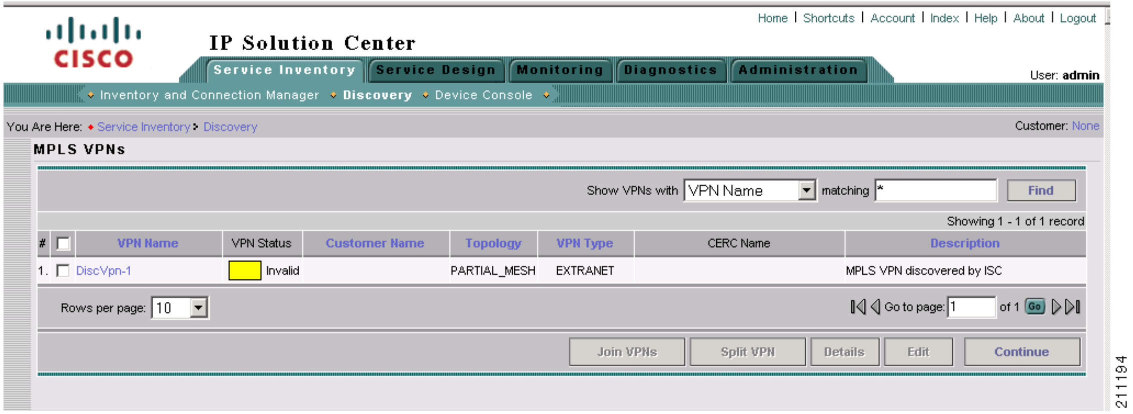
The MPLS VPNs window appears and lists the MPLS VPNs that were discovered. The status of the discovered MPLS VPNs is indicated as follows:

- If the MPLS VPN topology for a discovered MPLS is valid and ready to save in the ISC Repository, then the VPN Status indicates a **Valid** VPN and the status indicator is green.

- If the MPLS VPN topology for a discovered MPLS is invalid (the topology is Partial Mesh), is missing a Customer assignment, or includes an invalid CERC, then the VPN Status indicates an **Invalid** VPN and the status indicator is yellow. Partial Mesh topology VPNs are not supported by Cisco ISC, and must be broken into Full Mesh and/or Hub and Spoke components.

The MPLS VPN window shown in Figure 4-35 shows an invalid MPLS VPN (the topology is Partial Mesh and the Customer Name is blank).

Figure 4-35 MPLS VPNs Window with Invalid MPLS VPN



MPLS VPNs

Show VPNs with VPN Name matching *

Showing 1 - 1 of 1 record

#	☐	VPN Name	VPN Status	Customer Name	Topology	VPN Type	CERC Name	Description
1.	☐	DiscVpn-1	🟨 Invalid		PARTIAL_MESH	EXTRANET		MPLS VPN discovered by ISC

Rows per page: 10

Go to page: 1 of 1

Note If the MPLS VPN Discovery process discovers an MPLS VPN with a Partial Mesh topology, you must split the VPN into two or more separate VPNs that have a supported topology (Hub and Spoke or Full Mesh).

Step 2 Do one of the following:

- If you want to change the view in the MPLS VPNs window, select another view option.

  For a description of the MPLS VPN view options, see Filtering the MPLS VPN View, page 4-59.
- If the MPLS VPNs are valid and you do not need to make any changes to the MPLS VPN topology at this time, click **Continue** to create MPLS VPN services based on the discovered topology.
- If one or more of the discovered MPLS VPNs are invalid, you must complete the following steps:
  - **Split the VPN**—Select an invalid VPN and then click the **Split VPN** button.

    See Splitting a VPN, page 4-59 for instructions.
  - **Create New VPNs and add CERCs**—You must create new VPNs containing the devices in the VPN that you have split, and add CERCs to each new VPN.

    See Creating a VPN, page 4-62 for instructions.

Filtering the MPLS VPN View

Follow these steps to change the view in the MPLS VPNs window:

Step 1 Pull down the menu next to the **Show VPNs with** field.

You can filter the list of VPNs by VPN Name, Customer Name, Topology, VPN Type, or Description.

Step 2 To limit which VPNs are displayed within the selected category, enter a value in the **Matching** field.

The value in the **matching** field specifies a search mask that controls which sites are displayed. An asterisk (*) specifies display of all sites by the selected search criteria. A string followed by an asterisk specifies display of all sites starting with part of the element specified in the **Show VPNs with** field.

You can specify more than one wildcard (asterisk) value in a search string. For example, to display all VPNs that have “cisco” as part of the Customer Name, enter *cisco* in the matching field.

The display changes to display the VPNs with the selected criteria.

Splitting a VPN

In some situations, you might need to split an existing MPLS VPN before you complete the MPLS VPN Discovery process and actually create the MPLS VPN services.

For example:

- If the MPLS Service Discovery process discovers an invalid MPLS VPN (an MPLS VPN with a Partial Mesh topology), you must split the VPN into two or more CERCs that have a supported topology (Hub and Spoke or Full Mesh).
- You might also choose to split MPLS VPNs to change your topology, depending on your processing needs. Only one VPN can be split at a time.

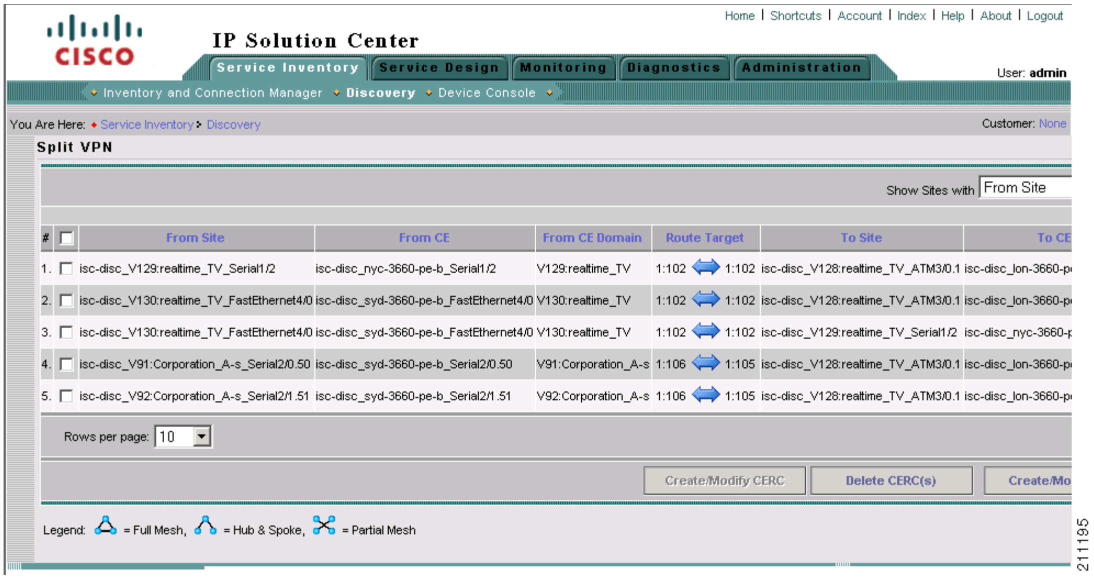
Follow these steps to split a VPN:

Step 1 In the MPLS VPNs window, check the check box next to a VPN that you want to split.

Step 2 Click the **Split VPN** button.

The Split VPN window appears, as shown in Figure 4-36 and Figure 4-37.

Figure 4-36 Split VPN Window (Left Portion)


Home | Shortcuts | Account | Index | Help | About | Logout
CISCO
IP Solution Center
Service Inventory
Service Design
Monitoring
Diagnostics
Administration
User: admin
Inventory and Connection Manager
Discovery
Device Console
You Are Here: Service Inventory > Discovery
Customer: None
Legend: = Full Mesh, = Hub & Spoke, = Partial Mesh
211195

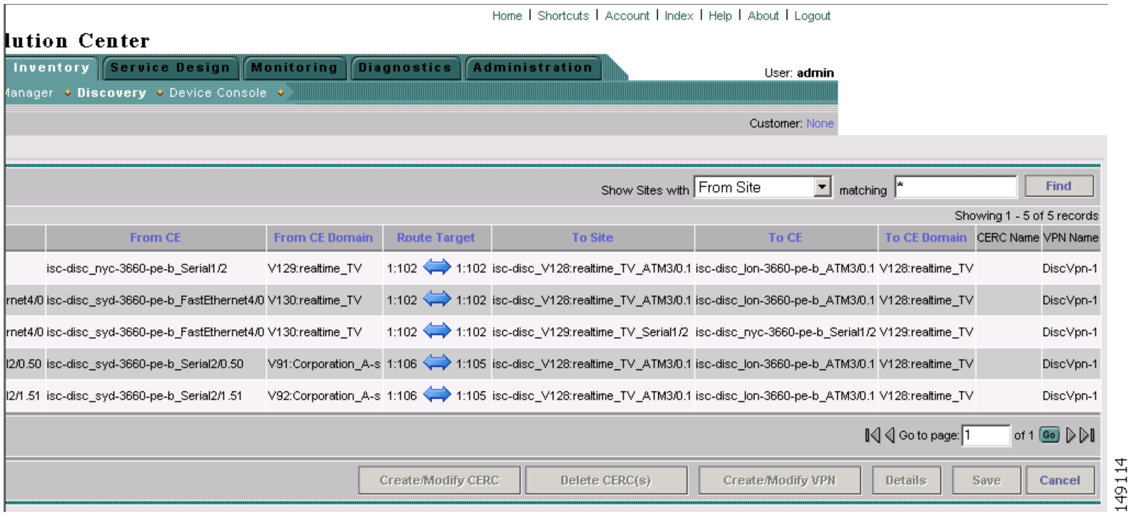
Split VPN

Show Sites with From Site

#	□	From Site	From CE	From CE Domain	Route Target	To Site	To CE
1.	□	isc-disc_V129:realtime_TV_Serial1/2	isc-disc_nyc-3660-pe-b_Serial1/2	V129:realtime_TV	1:102 ⇔ 1:102	isc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-p
2.	□	isc-disc_V130:realtime_TV_FastEthernet4/0	isc-disc_syd-3660-pe-b_FastEthernet4/0	V130:realtime_TV	1:102 ⇔ 1:102	isc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-p
3.	□	isc-disc_V130:realtime_TV_FastEthernet4/0	isc-disc_syd-3660-pe-b_FastEthernet4/0	V130:realtime_TV	1:102 ⇔ 1:102	isc-disc_V129:realtime_TV_Serial1/2	isc-disc_nyc-3660-p
4.	□	isc-disc_V91:Corporation_A-s_Serial2/0.50	isc-disc_syd-3660-pe-b_Serial2/0.50	V91:Corporation_A-s	1:106 ⇔ 1:105	isc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-p
5.	□	isc-disc_V92:Corporation_A-s_Serial2/1.51	isc-disc_syd-3660-pe-b_Serial2/1.51	V92:Corporation_A-s	1:106 ⇔ 1:105	isc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-p

Rows per page: 10

Figure 4-37 Split VPN Window (Right Portion)



Show Sites with From Site matching *

Showing 1 - 5 of 5 records

	From CE	From CE Domain	Route Target	To Site	To CE	To CE Domain	CERC Name	VPN Name
	isc-disc_nyc-3660-pe-b_Serial1/2	V129:realtime_TV	1:102 ⇔ 1:102	isc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-pe-b_ATM3/0.1	V128:realtime_TV		DiscVpn-1
rnet4/0	isc-disc_syd-3660-pe-b_FastEthernet4/0	V130:realtime_TV	1:102 ⇔ 1:102	isc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-pe-b_ATM3/0.1	V128:realtime_TV		DiscVpn-1
rnet4/0	isc-disc_syd-3660-pe-b_FastEthernet4/0	V130:realtime_TV	1:102 ⇔ 1:102	isc-disc_V129:realtime_TV_Serial1/2	isc-disc_nyc-3660-pe-b_Serial1/2	V129:realtime_TV		DiscVpn-1
l2/0.50	isc-disc_syd-3660-pe-b_Serial2/0.50	V91:Corporation_A-s	1:106 ⇔ 1:105	isc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-pe-b_ATM3/0.1	V128:realtime_TV		DiscVpn-1
l2/1.51	isc-disc_syd-3660-pe-b_Serial2/1.51	V92:Corporation_A-s	1:106 ⇔ 1:105	isc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-pe-b_ATM3/0.1	V128:realtime_TV		DiscVpn-1

Go to page: 1 of 1

Step 3 In the Split VPN window, select several of the links.

In the example shown in Figure 4-37, select the links that would comprise either a Hub and Spoke or Full Mesh topology.

For example, in the Split VPN window shown in Figure 4-36 and Figure 4-37, the first three links all have Route Targets of **1:102** and together form a Full Mesh topology.

The remaining two links have Route Targets of **1:106** and **1:105**. These links together form a Hub and Spoke topology.

To split this VPN, the first three links need to be associated with one CERC, and the two remaining links need to be associated with another CERC. Then we can split this VPN into two separate VPNs following the ISC best practice convention of one CERC per VPN.

Step 4 Click the **Create/Modify CERC** button.

You are prompted for a CERC name.

Step 5 Enter the new CERC name and then click the **Save** button.

Step 6 Repeat these steps for the rest of the devices that are included in invalid VPNs.

For example, in the topology shown Figure 4-36 and Figure 4-37, select the devices that have the route target **1:106 to 1:105**.

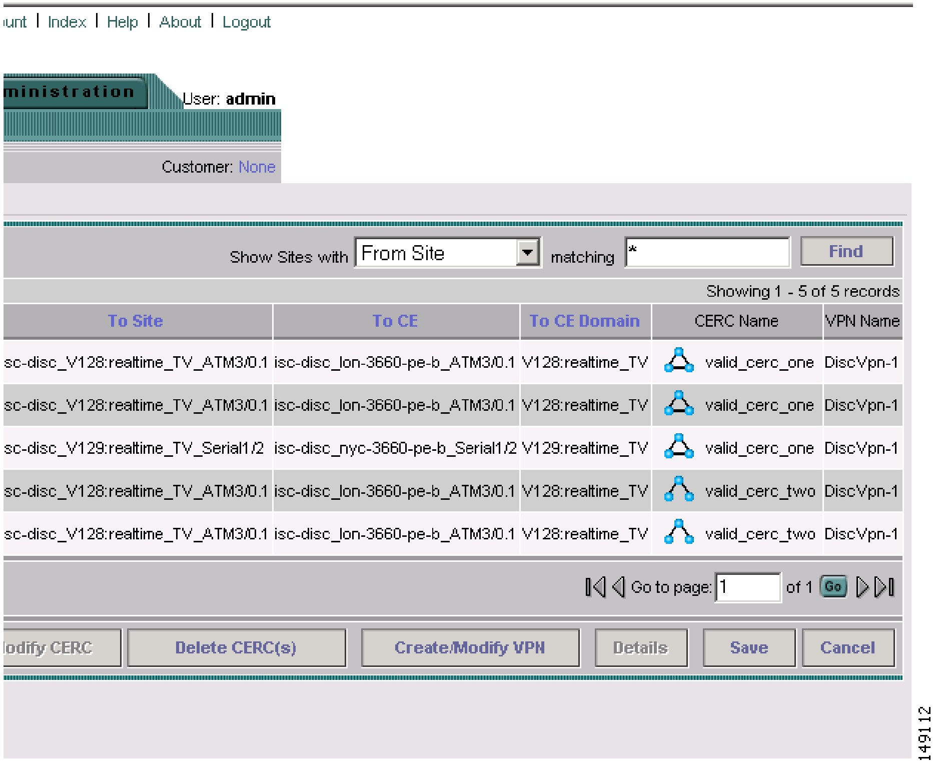
Step 7 Click the **Create/Modify CERC** button.

Step 8 When you are prompted for a CERC name, enter the new CERC name and then click the **Save** button.

The Split VPNs window appears again, and the right portion of the window shows the new CERCs that have been created.

Figure 4-38 shows an example.

Figure 4-38 Split VPNs Window After Creation of a Valid CERC Topology



Show Sites with From Site matching * Find

Showing 1 - 5 of 5 records

To Site	To CE	To CE Domain	CERC Name	VPN Name
sc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-pe-b_ATM3/0.1	V128:realtime_TV	valid_cerc_one	DiscVpn-1
sc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-pe-b_ATM3/0.1	V128:realtime_TV	valid_cerc_one	DiscVpn-1
sc-disc_V129:realtime_TV_Serial1/2	isc-disc_nyc-3660-pe-b_Serial1/2	V129:realtime_TV	valid_cerc_one	DiscVpn-1
sc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-pe-b_ATM3/0.1	V128:realtime_TV	valid_cerc_two	DiscVpn-1
sc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-pe-b_ATM3/0.1	V128:realtime_TV	valid_cerc_two	DiscVpn-1

Go to page: 1 of 1 Go

odify CERC | Delete CERC(s) | Create/Modify VPN | Details | Save | Cancel

Notice that in the example in Figure 4-38, the two new CERCs that have been created (**valid_cerc_one** and **valid_cerc_two**), have valid topologies. The first CERC, v**alid_cerc_one,** has a Full Mesh topology and the second CERC, **valid_cerc_two**, has a Hub and Spoke topology.

Step 9 Click the **Save** button.

You are now ready to continue to the next step, creating VPNs and adding CERCs to the VPNs.

Creating a VPN

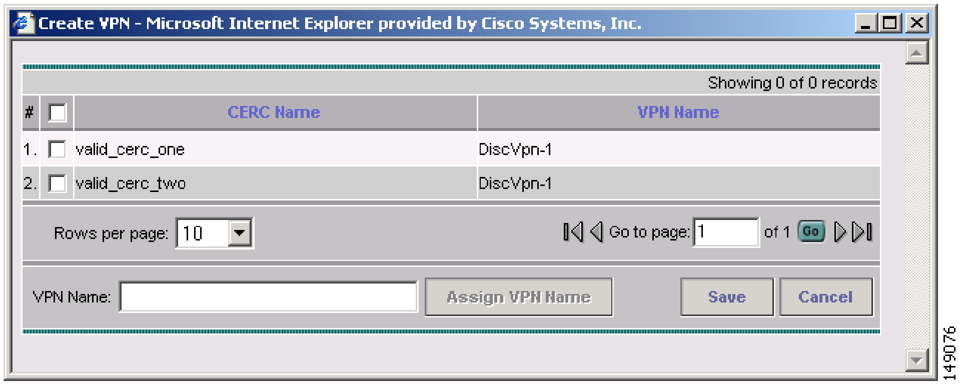
After you have created a CERC, you must create a VPN and then add the CERC to it.

Follow these steps to create a VPN:

Step 1 In the Split VPN window, select **Create/Modify VPN.**

The Create VPN window appears, as shown in Figure 4-39.

Figure 4-39 Create VPN Window


Create VPN - Microsoft Internet Explorer provided by Cisco Systems, Inc.
Assign VPN Name
Save
Cancel
Go
149076

Showing 0 of 0 records

#	□	CERC Name	VPN Name
1.	□	valid_cerc_one	DiscVpn-1
2.	□	valid_cerc_two	DiscVpn-1

Rows per page: 10

Go to page: 1 of 1

VPN Name:

Step 2 Select the CERCs that you want to assign to the VPN.

In the example shown in Figure 4-39, select **valid_cerc_one**.

Step 3 In the VPN Name field, enter a name for the VPN.

For this example, enter **vpn_one**.

Step 4 Click the **Assign VPN Name** button.

Step 5 Click **Save**.

The VPN is created and appears in the Split VPN window in the VPN Name field.

Step 6 Create any additional VPNs as needed.

Continuing with the CERCs shown in the sample windows in Splitting a VPN, page 4-59, a VPN must be created and have a CERC assigned to it. To do this:

a. In the Split VPN window, click **Create/Modify VPN**.

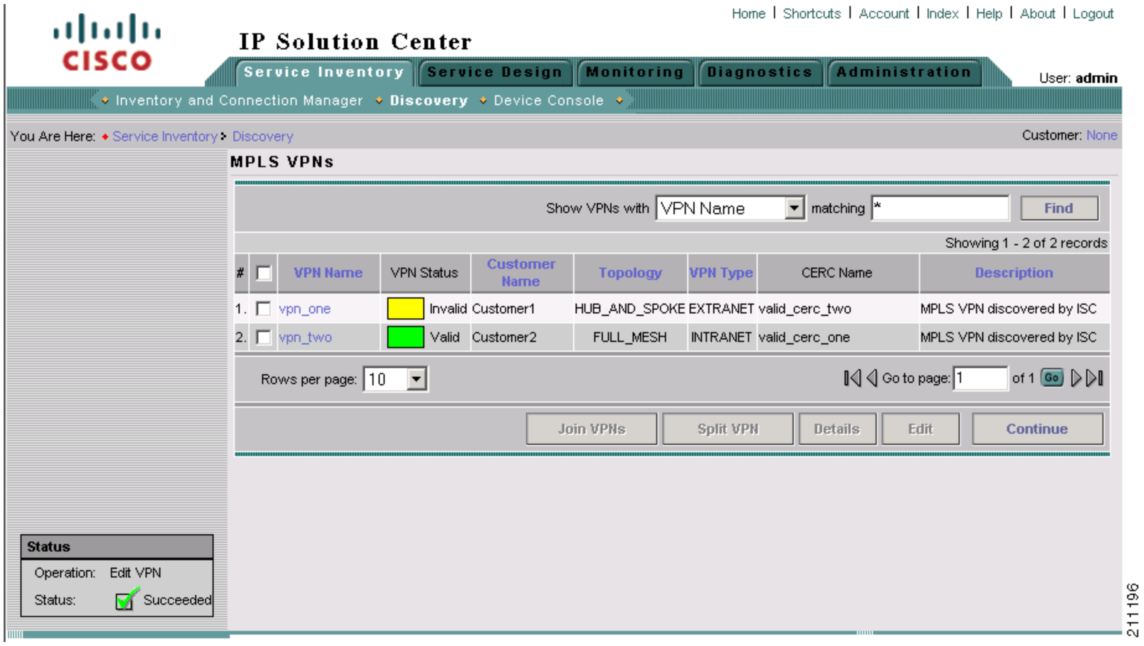
b. In the Create VPN window, create a second VPN and assign a CERC to it.

In the example screen, you could select the second CERC (**valid_cerc_two**) to the newly created VPN to it.

Step 7 After you are finished creating VPNs, click the **Save** button in the Split VPN window.

The MPLS VPNs window appears, as shown in Figure 4-40.

Figure 4-40 MPLS VPNs Window with Valid VPN and Invalid VPN



You Are Here: Service Inventory > Discovery

Customer: None

MPLS VPNs

Show VPNs with VPN Name matching *

Showing 1 - 2 of 2 records

#	□	VPN Name	VPN Status	Customer Name	Topology	VPN Type	CERC Name	Description
1.	□	vpn_one	🟨 Invalid	Customer1	HUB_AND_SPOKE	EXTRANET	valid_cerc_two	MPLS VPN discovered by ISC
2.	□	vpn_two	🟩 Valid	Customer2	FULL_MESH	INTRANET	valid_cerc_one	MPLS VPN discovered by ISC

Rows per page: 10

Go to page: 1 of 1 Go

Status

Operation: Edit VPN

Status: ✓ Succeeded

Note In the example shown in Figure 4-40, one of the VPNs is marked as **Valid** and has a green status indicator. However, the other VPN shown in the window is marked as **Invalid** and has a yellow indicator.

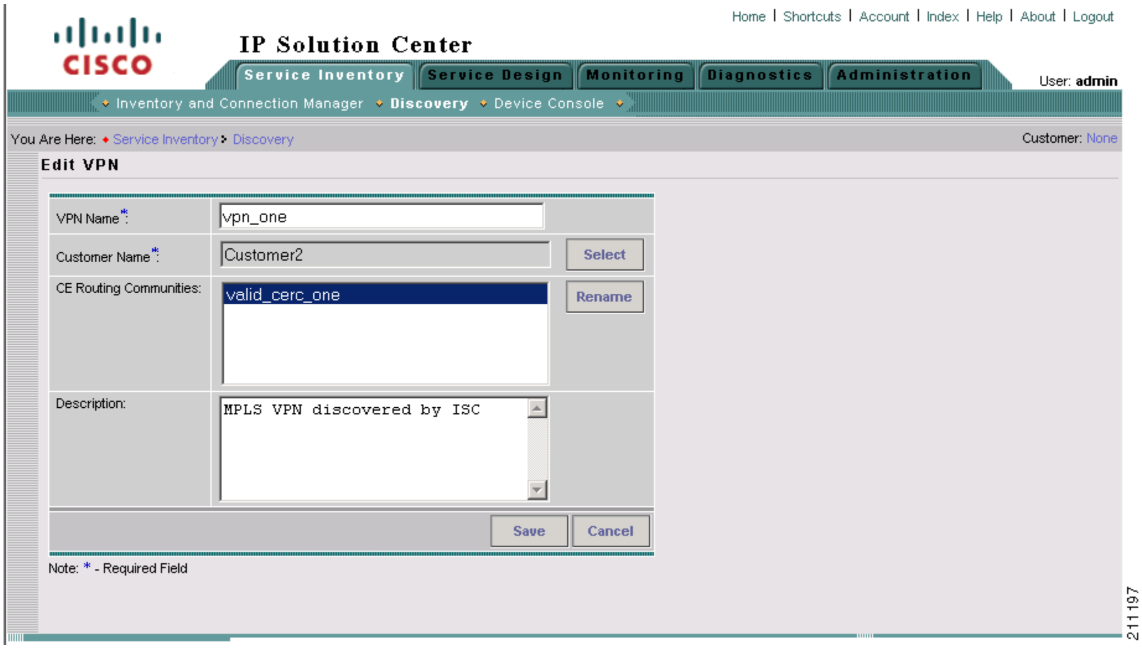
This occurs because in some instances, the MPLS Discovery process cannot completely validate the data. In this situation, you can still continue with the Service Discovery process and create MPLS VPN services. However, the process will skip the invalid VPN, and you must configure the VPN service manually using the ISC provisioning commands.

Step 8 Follow these steps to assign a Customer to each VPN:

a. Select a VPN entry in the MPLS VPNs window and then click the **Edit** button.

The Edit VPN window appears, as shown in Figure 4-41.

Figure 4-41 Edit VPN Window



Edit VPN

VPN Name*: vpn_one

Customer Name*: Customer2

CE Routing Communities: valid_cerc_one

Description: MPLS VPN discovered by ISC

Note: * - Required Field

b. Click the **Select** button next to the Customer Name field.

A list of customer names appears.

c. Click the radio button next to customer name and then **Select**.

d. If you want to rename the CERC, click **Rename** and then rename it.

e. Click **Save**.

The Customer name now appears in the MPLS VPNs window.

Note In some cases, an apparently valid VPN will be marked as invalid. This VPN will be skipped in the processing. You will then have to configure it manually using the ISC provisioning commands.

Step 9 After you are finished editing VPNs, click the **Continue** button to initiate the MPLS VPN service creation process.

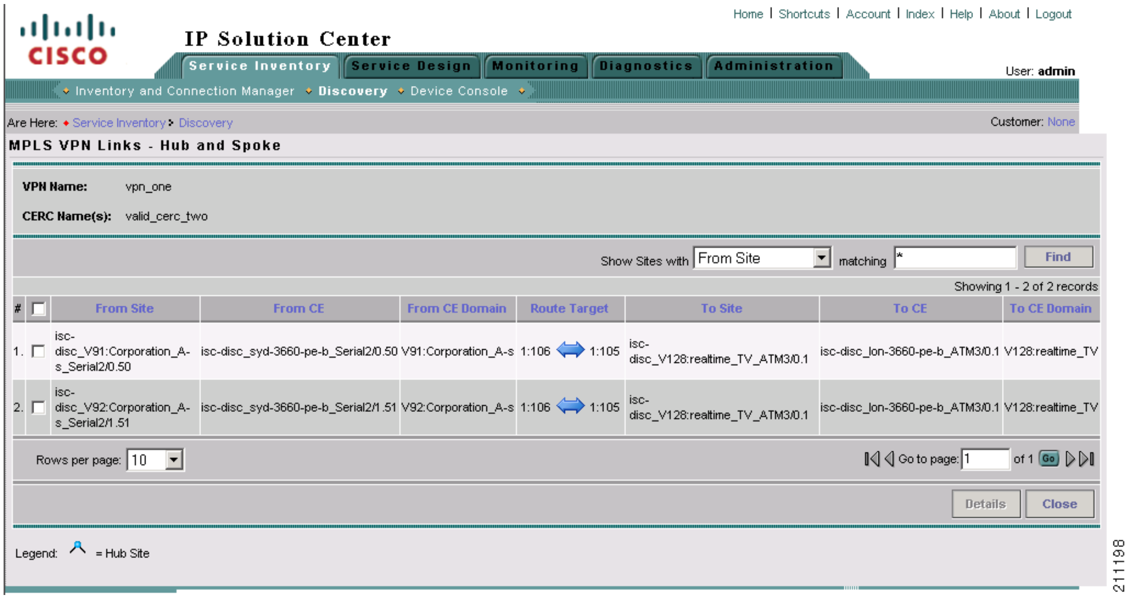
Viewing VPN Link Details

Follow these steps to view details of VPNs that were discovered:

Step 1 In the MPLS VPNs window, select a VPN that has details you want to view and then click the **Details** button.

The MPLS VPN Link window appears, as shown in Figure 4-42.

Figure 4-42 MPLS VPN Links Window



MPLS VPN Links - Hub and Spoke

VPN Name: vpn_one

CERC Name(s): valid_cerc_two

Show Sites with: From Site matching: * Find

Showing 1 - 2 of 2 records

#	☐	From Site	From CE	From CE Domain	Route Target	To Site	To CE	To CE Domain
1.	☐	isc-disc_V91:Corporation_A-s_Serial2/0.50	isc-disc_syd-3660-pe-b_Serial2/0.50	V91:Corporation_A-s	1:106 ⟺ 1:105	isc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-pe-b_ATM3/0.1	V128:realtime_TV
2.	☐	isc-disc_V92:Corporation_A-s_Serial2/1.51	isc-disc_syd-3660-pe-b_Serial2/1.51	V92:Corporation_A-s	1:106 ⟺ 1:105	isc-disc_V128:realtime_TV_ATM3/0.1	isc-disc_lon-3660-pe-b_ATM3/0.1	V128:realtime_TV

Rows per page: 10 Go to page: 1 of 1 Go

Details Close

Legend: = Hub Site

Step 2 To filter the MPLS VPN links that are displayed, select a value from the pull-down list in the **Show Sites with** field.

You can filter the list of VPNs by From Site, From CE, From CE Domain, Route Target, To Site, To CE, or to CE Domain.

The value in the **matching** field specifies a search mask that controls which sites are displayed. An asterisk (*) specifies display of all sites by the selected search criteria. A string followed by an asterisk specifies display of all sites starting with part of the element specified in the **Show Sites with** field.

You can specify more than one wildcard (asterisk) value in a search string. For example, to display all sites that have "realtime" in the From CE Name, select **From CE Name** in the **Show Sites with** field and then name, enter *realtime* in the matching field.

The display changes to show only the specified links.

Saving the MPLS VPNs and Initiating MPLS VPN Service Creation

After you are finished editing the data for the discovered MPLS VPNs in the MPLS VPNs window, click the **Continue** button.

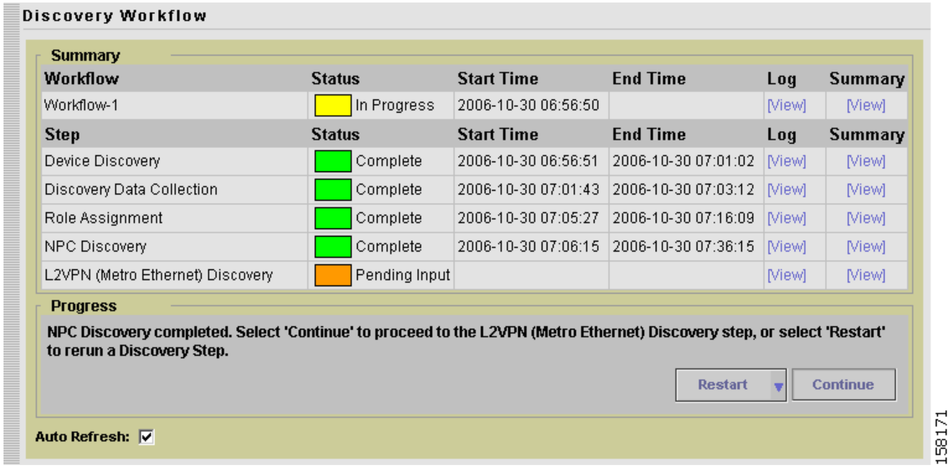
The Discovery process creates VPN services. After the process is complete, the Discovery Workflow window indicates that the MPLS VPN Discovery process is **COMPLETE** and the status indicator is green.

If you also selected **L2VPN (Metro Ethernet) Discovery** in the Discovery window before starting the Discovery process, you can now proceed to Metro Ethernet service discovery.

Step 7: Perform L2VPN (Metro Ethernet) Service Discovery (Optional)

If you selected **L2VPN (Metro Ethernet) Discovery** in the Discovery window before starting the Discovery process, then after the previous steps are complete, the Discovery Workflow window shows the L2VPN (Metro Ethernet) Discovery as **Pending Input,** as shown in Figure 4-43.

Figure 4-43 Discovery Workflow Window with MPLS Ethernet Discovery Pending Input



Discovery Workflow

Summary

Workflow	Status	Start Time	End Time	Log	Summary
Workflow-1	🟨 In Progress	2006-10-30 06:56:50		[View]	[View]
Step	**Status**	**Start Time**	**End Time**	**Log**	**Summary**
Device Discovery	🟩 Complete	2006-10-30 06:56:51	2006-10-30 07:01:02	[View]	[View]
Discovery Data Collection	🟩 Complete	2006-10-30 07:01:43	2006-10-30 07:03:12	[View]	[View]
Role Assignment	🟩 Complete	2006-10-30 07:05:27	2006-10-30 07:16:09	[View]	[View]
NPC Discovery	🟩 Complete	2006-10-30 07:06:15	2006-10-30 07:36:15	[View]	[View]
L2VPN (Metro Ethernet) Discovery	🟧 Pending Input			[View]	[View]

Progress

NPC Discovery completed. Select 'Continue' to proceed to the L2VPN (Metro Ethernet) Discovery step, or select 'Restart' to rerun a Discovery Step.

Follow these steps to initiate Metro Ethernet Service Discovery:

Note L2VPN service discovery does not support devices running IOS XR.

Step 1 Before you initiate Metro Ethernet Service Discovery, follow these steps:

a. Choose **Service Inventory > Inventory and Connection Manager.**

b. In the task pane at the left of the Inventory and Connection Manager window, select **Access Domains**.

c. Create access domains for any N-PE devices in the Metro Ethernet topology.

For detailed instructions, see the "Creating Access Domains" section on page 3-125.

d. Choose **Service Inventory > Inventory and Connection Manager.**

e. In the task pane at the left of the Inventory and Connection Manager window, select **Resource Pools**.

f. Create resource pools for each of the access domains that you created.

For detailed instructions, see the "Resource Pools" section on page 3-126.

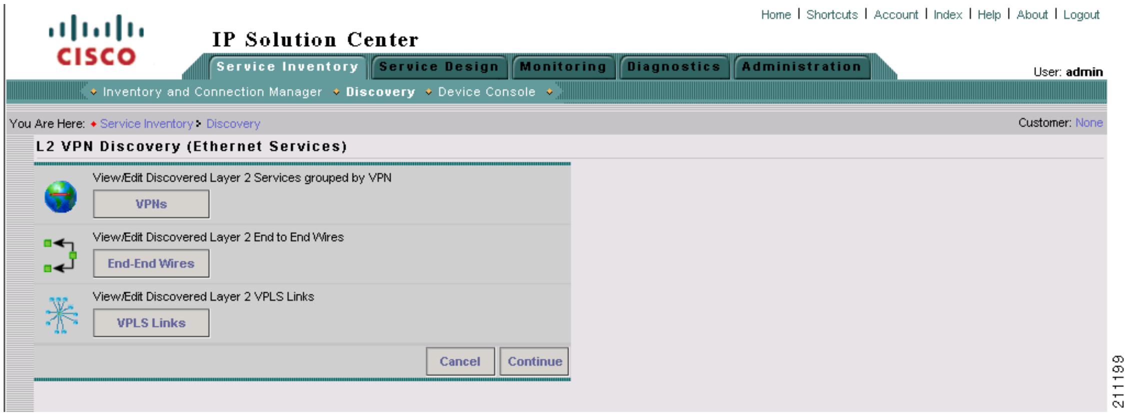
g. Choose **Service Inventory > Discovery.**

The Discovery Workflow window shows the L2VPN (Metro Ethernet) Discovery process as **Pending Input.**

Step 2 Click **Continue**.

The L2VPN Discovery (Ethernet Services) window appears, as shown in Figure 4-44.

Figure 4-44 L2VPN Discovery (Ethernet Services) Window



L2 VPN Discovery (Ethernet Services)

View/Edit Discovered Layer 2 Services grouped by VPN

View/Edit Discovered Layer 2 End to End Wires

View/Edit Discovered Layer 2 VPLS Links

Step 3 Select one of the following actions:

- **View/Edit Discovered Layer 2 Services grouped by VPN**—Allows you to view the discovered L2VPN services and edit them as required.
- **View/Edit Discovered Layer 2 End to End Wires**—Allows you to view the discovered Layer 2 End to End wires and edit them as required.
- **View/Edit Discovered Layer 2 VPLS Links**—Allows you to view the discovered Layer 2 Virtual Private LAN Service (VPLS) links and edit them as required.

The following sections of this chapter describe each of these actions.

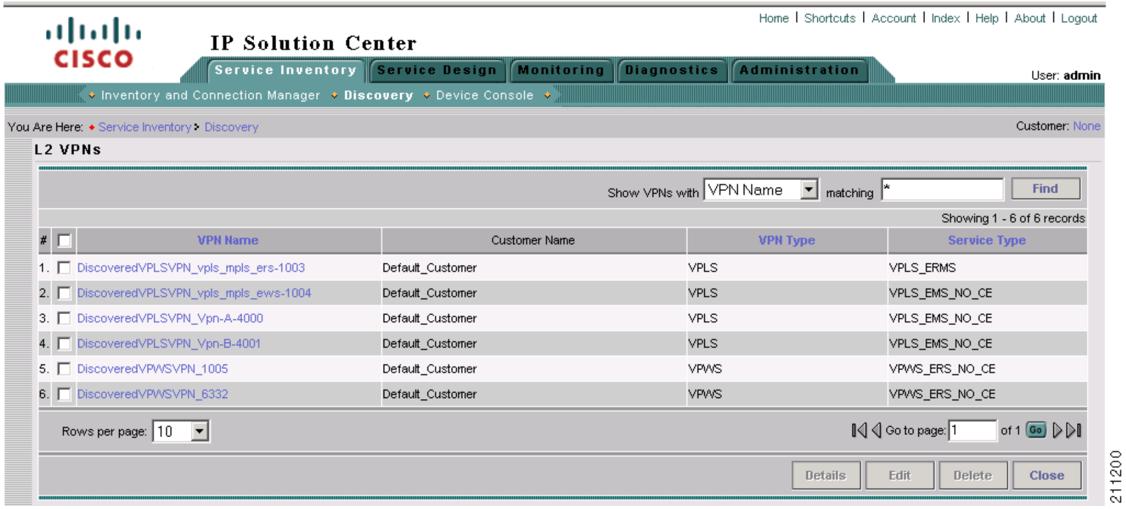
Viewing Discovered Layer 2 Services Grouped by VPN

Follow these steps to view discovered Layer 2 services grouped by VPN:

Step 1 In the L2VPN Discovery (Ethernet Services) window, click the **VPNs** button.

The L2VPNs window appears, as shown in Figure 4-45.

Figure 4-45 L2VPNs Window



#	□	VPN Name	Customer Name	VPN Type	Service Type
1.	□	DiscoveredVPLSVPN_vpls_mpls_ers-1003	Default_Customer	VPLS	VPLS_ERMS
2.	□	DiscoveredVPLSVPN_vpls_mpls_ews-1004	Default_Customer	VPLS	VPLS_EMS_NO_CE
3.	□	DiscoveredVPLSVPN_Vpn-A-4000	Default_Customer	VPLS	VPLS_EMS_NO_CE
4.	□	DiscoveredVPLSVPN_Vpn-B-4001	Default_Customer	VPLS	VPLS_EMS_NO_CE
5.	□	DiscoveredVPWSVPN_1005	Default_Customer	VPWS	VPWS_ERS_NO_CE
6.	□	DiscoveredVPWSVPN_6332	Default_Customer	VPWS	VPWS_ERS_NO_CE

The L2VPNs window allows you to perform the following tasks:

- View detailed information about a Layer 2 VPN.

  This task is explained in the following steps of this procedure.

- Display a window that allows you to edit the configuration information for an existing Layer 2 VPN.

  See Editing Discovered Layer 2 Services Grouped by VPN, page 4-69 for detailed instructions.

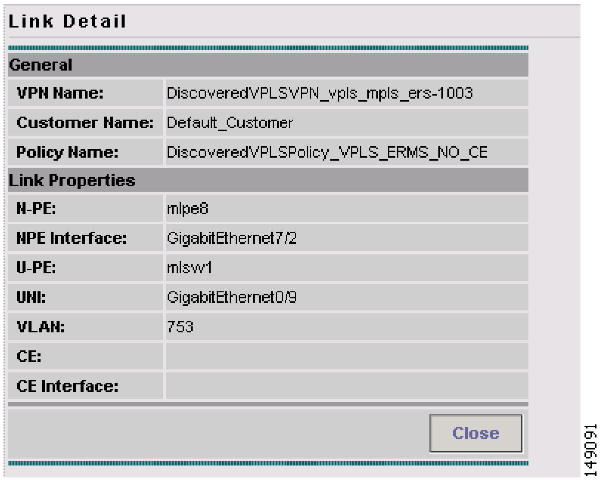
- Delete an existing Layer 2 VPN.

  See Deleting Discovered Layer 2 Services Grouped by VPN, page 4-70 for instructions on this task.

Step 2 To view detailed information about a Layer 2 service, check the check box next to a VPN that has details you want to view, and then click the **Details** button.

The Link Details window appears, as shown in Figure 4-46.

Figure 4-46 Link Details Window



General	
VPN Name:	DiscoveredVPLSVPN_vpls_mpls_ers-1003
Customer Name:	Default_Customer
Policy Name:	DiscoveredVPLSPolicy_VPLS_ERMS_NO_CE
Link Properties	
N-PE:	mlpe8
NPE Interface:	GigabitEthernet7/2
U-PE:	mlsw1
UNI:	GigabitEthernet0/9
VLAN:	753
CE:	
CE Interface:	

The Link Details window shows the details about the discovered VPN, such as the User-Network Interface (UNI), in a table format.

Step 3 When you are finished viewing the link details, click the **Close** button.

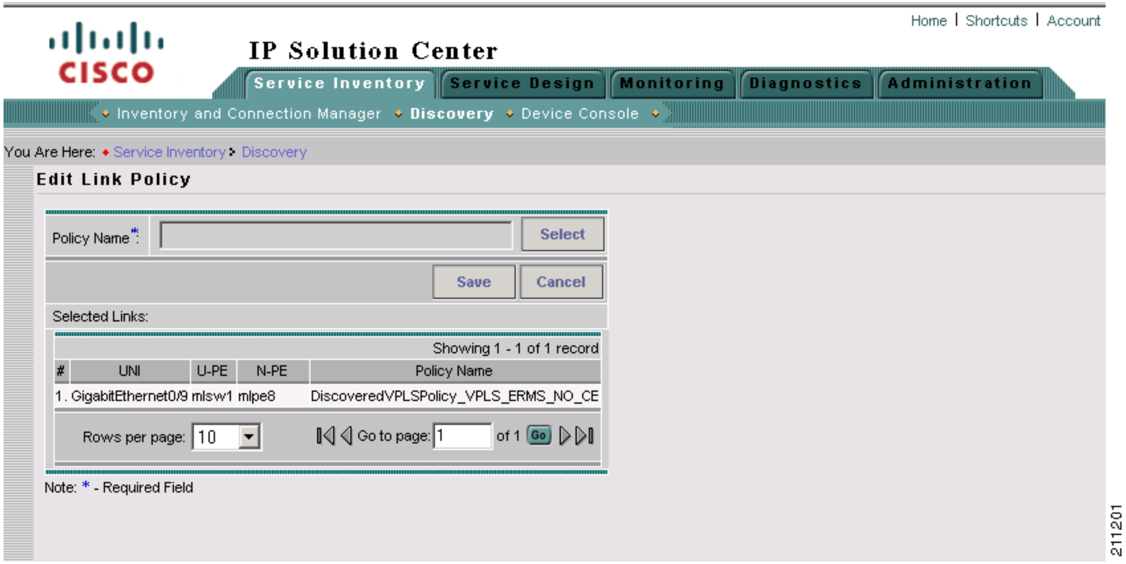
Editing Discovered Layer 2 Services Grouped by VPN

You can edit a discovered Layer 2 VPN service to change the policy that is applied to the service. Follow these steps to edit a Layer 2 VPN service:

Step 1 In the L2VPNs window, check the check box next to a VPN that you want to edit, and then click the **Edit** button.

The Edit Link Policy window appears, as shown in Figure 4-47.

Figure 4-47 Edit Link Policy Window



Edit Link Policy

Policy Name*:

Selected Links:

Showing 1 - 1 of 1 record

#	UNI	U-PE	N-PE	Policy Name
1.	GigabitEthernet0/9	mlsw1	mlpe8	DiscoveredVPLSPolicy_VPLS_ERMS_NO_CE

Rows per page: 10 Go to page: 1 of 1

Note: * - Required Field

Step 2 To change the link policy for the service, follow these steps:

a. Click the **Policy** button next to the Policy Name field.

A list of policies appears.

You can change the list of policies by choosing a filter from the pull-down list in the **Show VPN policies with** field and/or entering a search mask in the **Matching** field.

You can filter the policy list by Policy Name, Customer Name, Provider Name, or Global policy name. And you can limit the lists of policies displayed in the selected category by entering a value in the Matching field.

Step 3 Click the radio button next to a policy that you want to apply to the service and then click **Select**.

Step 4 Do one of the following:

- Click **Save** to save your changes.
- Click **Cancel** to cancel the changes.

Deleting Discovered Layer 2 Services Grouped by VPN

Follow these steps to delete a Layer 2 service:

Step 1 In the L2VPNs window, check the check box next to a VPN that you want to delete, and then click the **Delete** button.

The following message appears:

```
Links/End to End wires associated with all selected VPNs will be deleted as a result of
this operation. Do you really want to Delete?
```

Step 2 If you are sure that you want to delete the VPN, click **OK**; otherwise, click **Cancel**.

If you click **OK**, the VPN and associated links and end-to-end wires are deleted.

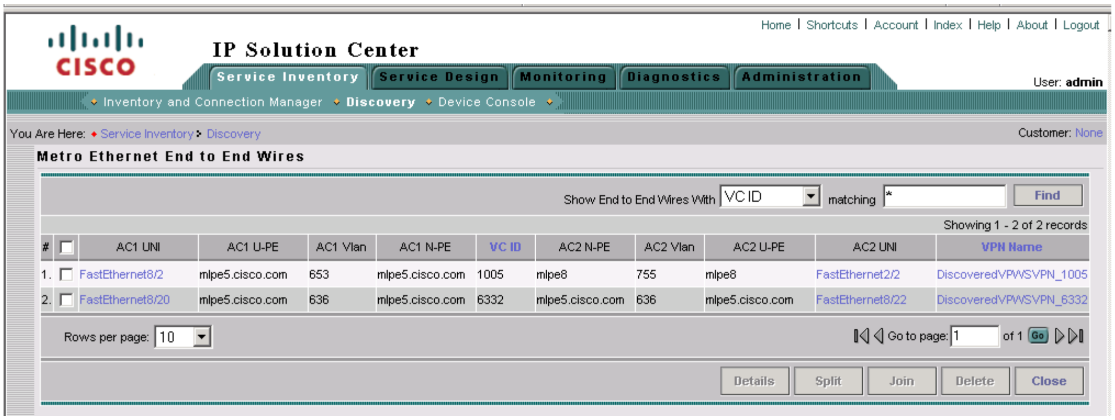
Viewing Discovered Layer 2 End to End Wires

Follow these steps to view discovered Layer 2 end-to-end wires:

Step 1 In the L2VPN Discovery (Ethernet Services) window, click the **End-End Wires** button.

The Metro Ethernet End to End Wires window appears, as shown in Figure 4-48.

Figure 4-48 Metro Ethernet End to End Wires Window



Metro Ethernet End to End Wires

Show End to End Wires With VC ID matching *

Showing 1 - 2 of 2 records

#	□	AC1 UNI	AC1 U-PE	AC1 Vlan	AC1 N-PE	VC ID	AC2 N-PE	AC2 Vlan	AC2 U-PE	AC2 UNI	VPN Name
1.	□	FastEthernet8/2	mlpe5.cisco.com	653	mlpe5.cisco.com	1005	mlpe8	755	mlpe8	FastEthernet2/2	DiscoveredVPWSVPN_1005
2.	□	FastEthernet8/20	mlpe5.cisco.com	636	mlpe5.cisco.com	6332	mlpe5.cisco.com	636	mlpe5.cisco.com	FastEthernet8/22	DiscoveredVPWSVPN_6332

Rows per page: 10

Go to page: 1 of 1 Go

The Metro Ethernet End to End Wires window allows you to perform the following tasks:

- View detailed information about a Metro Ethernet end-to-end wire.

  This task is explained in the following steps of this procedure.

- Edit the VPN associated with the end-to-end wire.

  See Editing the VPN Associated with an End to End Wire, page 4-72 for a description of this task.

- Split an existing end-to-end wire into two end-to-end wires

  See Splitting Layer 2 Service End to End Wires, page 4-73 for a description of this task.

- Join existing end-to-end wires into a single end-to-end wire

  See Joining Layer 2 Service End to End Wires, page 4-74 for a description of this task.

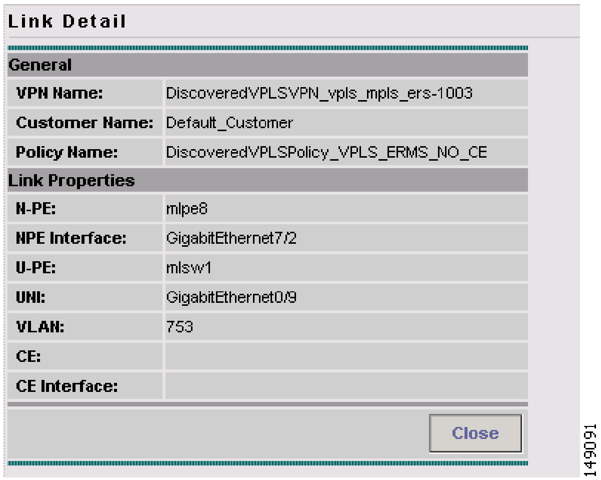
- Delete an existing end-to-end wire.

  See Deleting Discovered Layer 2 Services Grouped by VPN, page 4-70 for instructions on this task.

Step 2 To view detailed information about a Layer 2 service, check the check box next to a VPN that has details you want to view, and then click the **Details** button.

The Link Details window appears, as shown in Figure 4-49.

Figure 4-49 Link Details Window



Link Detail

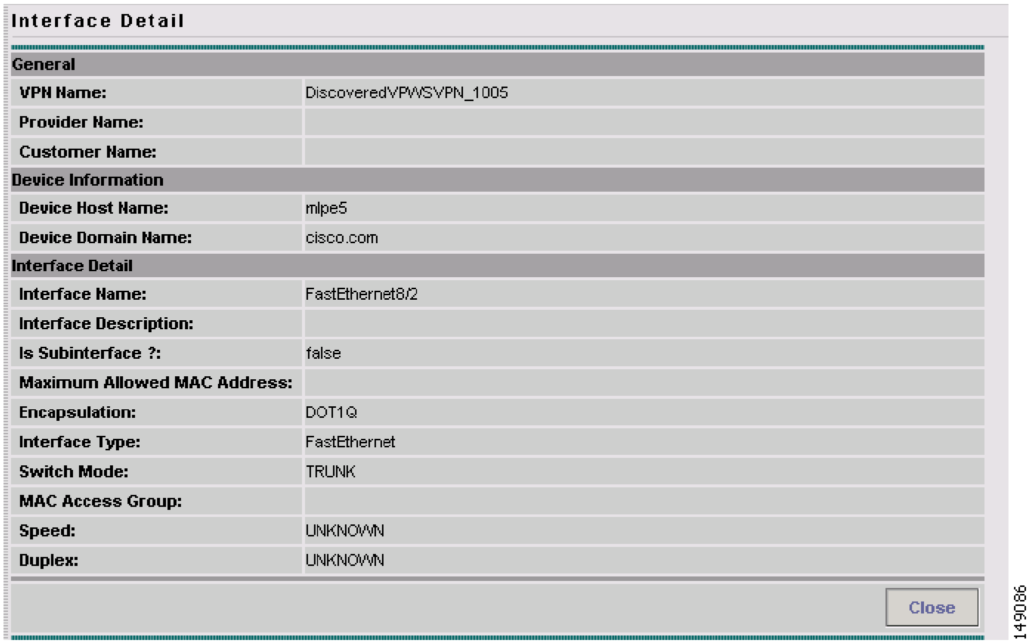
General	
VPN Name:	DiscoveredVPLSVPN_vpls_mpls_ers-1003
Customer Name:	Default_Customer
Policy Name:	DiscoveredVPLSPolicy_VPLS_ERMS_NO_CE
Link Properties	
N-PE:	mlpe8
NPE Interface:	GigabitEthernet7/2
U-PE:	mlsw1
UNI:	GigabitEthernet0/9
VLAN:	753
CE:	
CE Interface:	

Step 3 When you are finished viewing the link details, click the **Close** button.

Step 4 If you want to view the details of the interfaces in the end-to-end wire, click the interface name in either the AC1 UNI or AC2 UNI field.

If you click on an interface name, the Interface Detail window appears, as shown in Figure 4-50.

Figure 4-50 Interface Detail Window



Interface Detail

General	
VPN Name:	DiscoveredVPWSVPN_1005
Provider Name:	
Customer Name:	
Device Information	
Device Host Name:	mlpe5
Device Domain Name:	cisco.com
Interface Detail	
Interface Name:	FastEthernet8/2
Interface Description:	
Is Subinterface ?:	false
Maximum Allowed MAC Address:	
Encapsulation:	DOT1Q
Interface Type:	FastEthernet
Switch Mode:	TRUNK
MAC Access Group:	
Speed:	UNKNOWN
Duplex:	UNKNOWN

The Interface Detail window shows details about the selected interface, such as the hostname of the host where the interface is located, the type of encapsulation used on the interface, and the switch mode used on the interface.

Step 5 When you are finished viewing the interface details, click the **Close** button.

Editing the VPN Associated with an End to End Wire

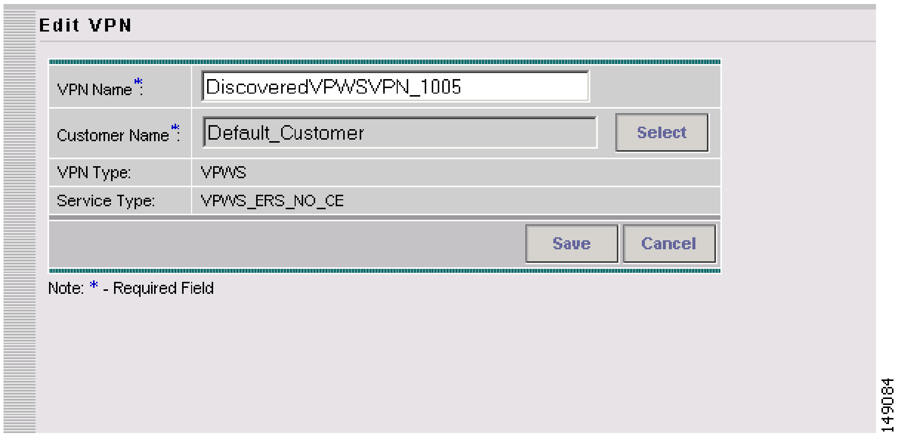
From the Metro Ethernet End to End Wires window, you can also edit the VPN that is associated with the end-to-end wire.

Follow these steps to edit the VPN associated with an end-to-end wire:

Step 1 In the Metro Ethernet End to End Wires window, click a VPN name shown in the VPN name field.

The Edit VPN window appears, as shown in Figure 4-51.

Figure 4-51 Edit VPN Window for L2VPN VPNs



Edit VPN

VPN Name*: DiscoveredVPWSVPN_1005

Customer Name*: Default_Customer

VPN Type: VPWS

Service Type: VPWS_ERS_NO_CE

Note: * - Required Field

Step 2 To edit the VPN name, enter a new VPN name in the VPN Name field.

Step 3 To edit the Customer Name, follow these steps:

a. Click the **Select** button next to the Customer Name.

A list of customers appears.

b. Click the radio button next to the new Customer Name that you want to configure.

c. Click the **Save** button.

The new VPN name and/or Customer Name appears in the Metro Ethernet End to End Wires window.

Splitting Layer 2 Service End to End Wires

You can split off an existing end-to-end wire from the VPN that it is associated with and associate it with a new VPN.

Follow these steps to split an end-to-end wire from an existing VPN:

Step 1 In the Metro Ethernet End to End Wires window, check the check box next to an end-to-end wire entry that you want to split from a VPN.

Note If there is only one ID for the VPN associated with the end-to-end wire, then you cannot perform a split action on the wire.

Step 2 Click the **Split** button.

A message appears asking if you want to proceed.

Step 3 If you want to continue with the process, click **OK**.

The end-to-end wires are split and are associated with two new VPNs. These names of the VPNs are created by the system by adding a new number to the end of the existing VPN name.

Joining Layer 2 Service End to End Wires

You can join two existing end-to-end wires to a single VPN.

Follow these steps to join two existing end-to-end wires:

Step 1 In the Metro Ethernet End to End Wires window, check the check box next to several end-to-end wire entries that you want to join.

A message appears asking if you want to proceed.

Step 2 If you want to continue with the process, click **OK**.

The selected end-to-end wires are joined to a new VPN. The name for this VPN is created by the system by adding a new number to the end of the existing highest numbered VPN name.

Deleting Layer 2 Service End to End Wires

Follow these steps to delete an existing end-to-end wire:

Step 1 In the Metro Ethernet End to End Wires window, check the check box next to one or more end-to-end wires that you want to delete.

A message appears asking if you want to proceed.

Step 2 If you want to continue with the process, click **OK**.

The selected end-to-end wire (or wires) is deleted. Any Attachment Circuit(s) associated with the wire(s) are also deleted.

Step 3 Click **Close** to close the Metro Ethernet End to End Wires window.

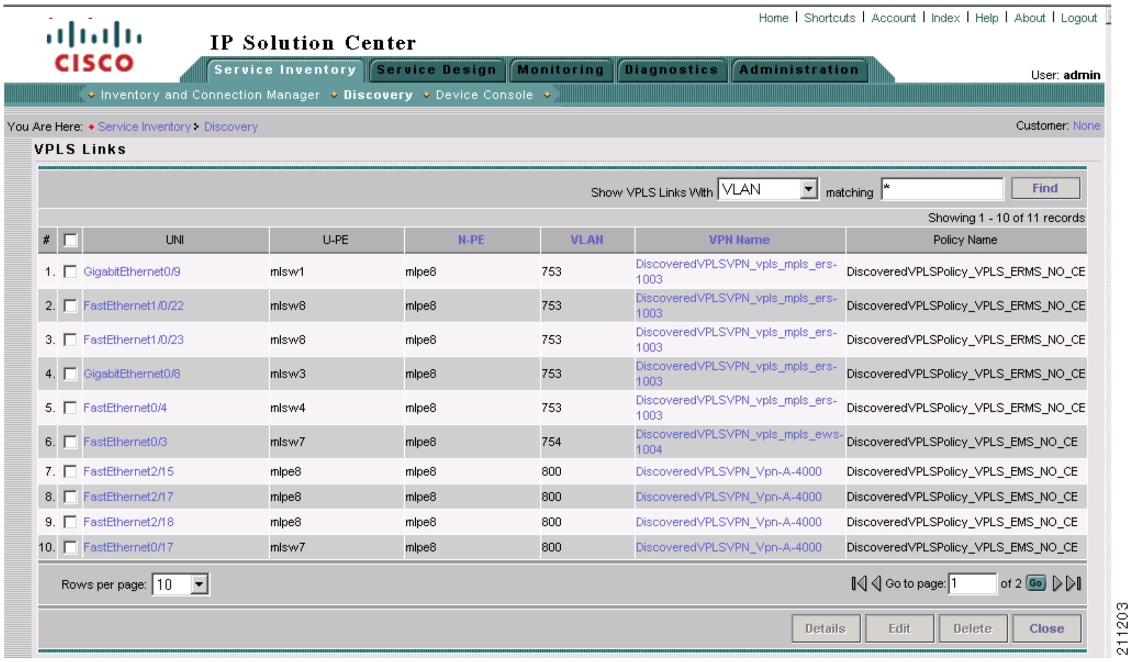
Viewing Discovered Layer 2 VPLS Links

Follow these steps to view discovered Layer 2 VPLS links:

Step 1 In the L2VPN Discovery (Ethernet Services) window, click the **VPLS Links** button.

The VPLS Links window appears, as shown in Figure 4-52.

Figure 4-52 VPLS Links Window



VPLS Links

Show VPLS Links With VLAN matching * Find

Showing 1 - 10 of 11 records

#	□	UNI	U-PE	N-PE	VLAN	VPN Name	Policy Name
1.	□	GigabitEthernet0/9	mlsw1	mlpe8	753	DiscoveredVPLSVPN_vpls_mpls_ers-1003	DiscoveredVPLSPolicy_VPLS_ERMS_NO_CE
2.	□	FastEthernet1/0/22	mlsw8	mlpe8	753	DiscoveredVPLSVPN_vpls_mpls_ers-1003	DiscoveredVPLSPolicy_VPLS_ERMS_NO_CE
3.	□	FastEthernet1/0/23	mlsw8	mlpe8	753	DiscoveredVPLSVPN_vpls_mpls_ers-1003	DiscoveredVPLSPolicy_VPLS_ERMS_NO_CE
4.	□	GigabitEthernet0/8	mlsw3	mlpe8	753	DiscoveredVPLSVPN_vpls_mpls_ers-1003	DiscoveredVPLSPolicy_VPLS_ERMS_NO_CE
5.	□	FastEthernet0/4	mlsw4	mlpe8	753	DiscoveredVPLSVPN_vpls_mpls_ers-1003	DiscoveredVPLSPolicy_VPLS_ERMS_NO_CE
6.	□	FastEthernet0/3	mlsw7	mlpe8	754	DiscoveredVPLSVPN_vpls_mpls_ews-1004	DiscoveredVPLSPolicy_VPLS_EMS_NO_CE
7.	□	FastEthernet2/15	mlpe8	mlpe8	800	DiscoveredVPLSVPN_Vpn-A-4000	DiscoveredVPLSPolicy_VPLS_EMS_NO_CE
8.	□	FastEthernet2/17	mlpe8	mlpe8	800	DiscoveredVPLSVPN_Vpn-A-4000	DiscoveredVPLSPolicy_VPLS_EMS_NO_CE
9.	□	FastEthernet2/18	mlpe8	mlpe8	800	DiscoveredVPLSVPN_Vpn-A-4000	DiscoveredVPLSPolicy_VPLS_EMS_NO_CE
10.	□	FastEthernet0/17	mlsw7	mlpe8	800	DiscoveredVPLSVPN_Vpn-A-4000	DiscoveredVPLSPolicy_VPLS_EMS_NO_CE

Rows per page: 10 Go to page: 1 of 2 Go

Details Edit Delete Close

The VPLS Links window allows you to perform the following tasks:

- View detailed information about a VPLS link.

  This task is explained in the following steps of this procedure.

- Display a window that allows you to edit the configuration information for an existing VPLS link.

  See Editing Discovered Layer 2 VPLS Links, page 4-76 for detailed instructions.

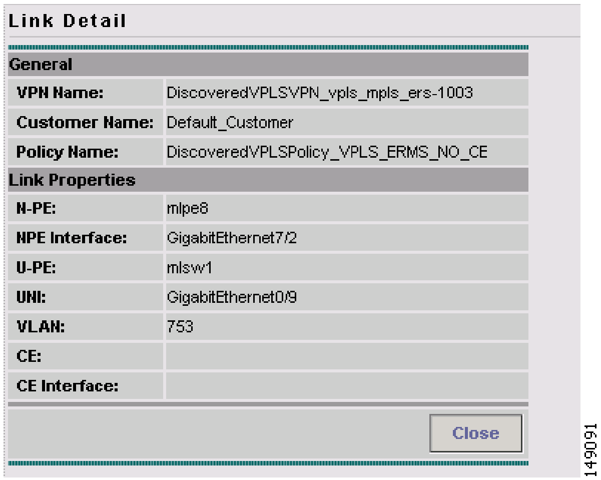
- Delete an existing Layer 2 VPN.

  See Deleting Discovered Layer 2 VPLS Links, page 4-77 for instructions on this task.

Step 2 To view detailed information about a VPLS link, check the check box next to a VPLS link that has details you want to view, and then click the **Details** button.

The Link Detail window appears, as shown in Figure 4-53.

Figure 4-53 Link Detail Window



Link Detail

General	
VPN Name:	DiscoveredVPLSVPN_vpls_mpls_ers-1003
Customer Name:	Default_Customer
Policy Name:	DiscoveredVPLSPolicy_VPLS_ERMS_NO_CE
Link Properties	
N-PE:	mlpe8
NPE Interface:	GigabitEthernet7/2
U-PE:	mlsw1
UNI:	GigabitEthernet0/9
VLAN:	753
CE:	
CE Interface:	

The Link Detail window shows the details about the discovered VPN, such as the User-Network Interface (UNI), in a table format.

Step 3 When you are finished viewing the link details, click the **Close** button.

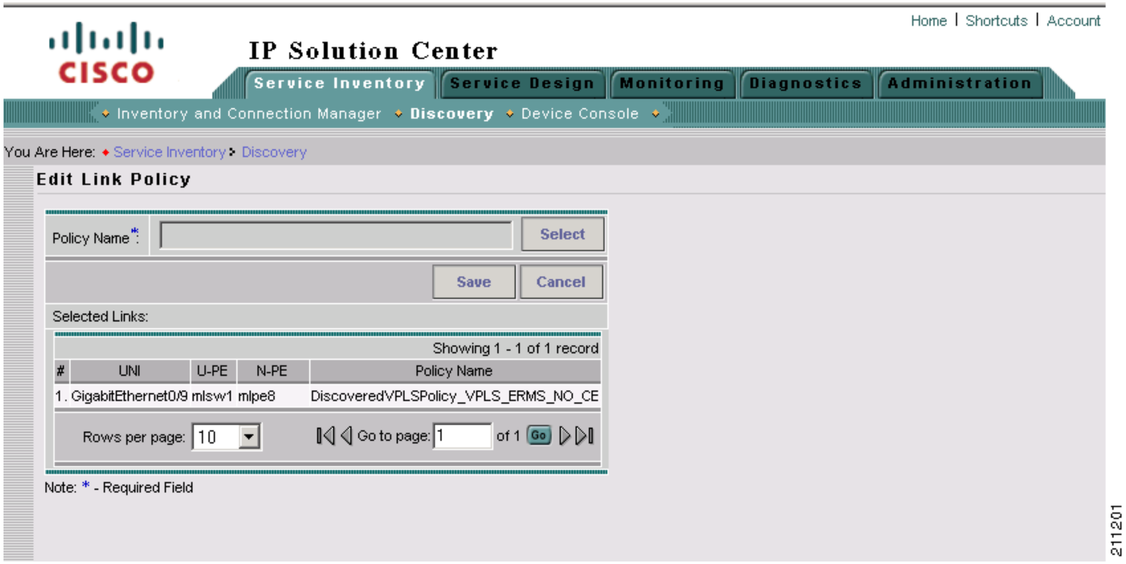
Editing Discovered Layer 2 VPLS Links

You can edit a discovered Layer 2 VPLS link to change the policy that is applied to the service. Follow these steps to edit a Layer 2 VPLS link:

Step 1 In the VPLS Links window, check the check box next to a VPLS link that you want to edit and then click the **Edit** button.

The Edit Link Policy window appears, as shown in Figure 4-54.

Figure 4-54 Edit Link Policy Window



#	UNI	U-PE	N-PE	Policy Name
1.	GigabitEthernet0/9	mlsw1	mlpe8	DiscoveredVPLSPolicy_VPLS_ERMS_NO_CE

Step 2 To change the link policy for the link, follow these steps:

a. Click the **Policy** button next to the Policy Name field.

A list of policies appears.

You can change the list of policies by choosing a filter from the pull-down list in the **Show VPN policies with** field and/or entering a search mask in the **Matching** field.

You can filter the policy list by Policy Name, Customer Name, Provider Name, or Global policy name. And you can limit the lists of policies displayed in the selected category by entering a value in the Matching field.

Step 3 Click the radio button next to a policy that you want to apply to the service, and then click **Select**.

Step 4 Do one of the following:

- Click **Save** to save your changes.
- Click **Cancel** to cancel the changes.

Deleting Discovered Layer 2 VPLS Links

Follow these steps to delete a VPLS link:

Step 1 In the VPLS Links window, check the check box next to a VPLS link that you want to delete and then click the **Delete** button.

The following message appears:

```
The selected link(s) will be deleted. Do you really want to Delete?
```

Step 2 If you are sure that you want to delete the VPLS, click **OK**; otherwise, click **Cancel**.

If you click **OK**, the VPLS link(s) are deleted.

Step 3 Click **Close** to close the VPLS links window.

Saving the L2VPN Metro Ethernet Policy and Initiating Service Creation

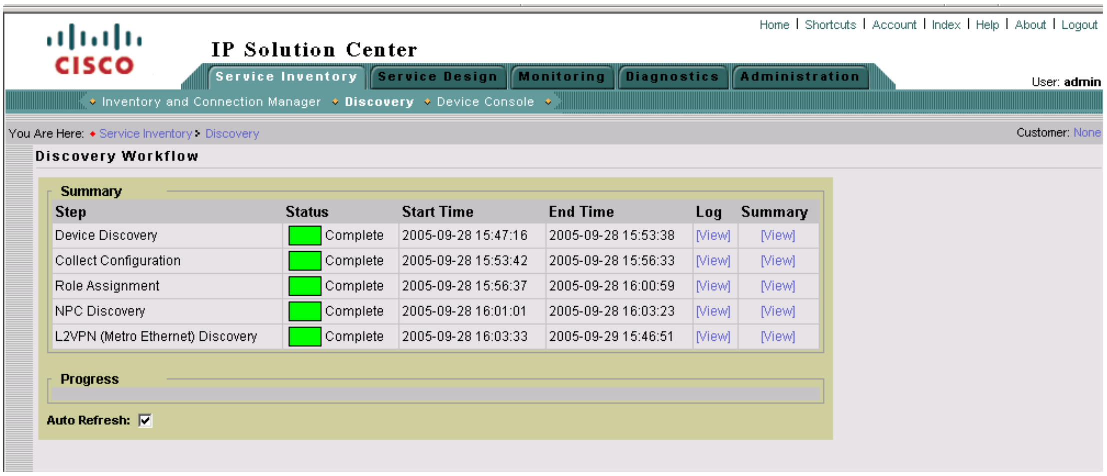
After you are finished viewing or editing the discovered L2VPN Metro Ethernet topology, click the **Close** button to return to the L2VPN Discovery (Ethernet Services) window.

Click the Continue button to initiate the L2VPN Service Discovery process.

The Discovery Workflow window appears and indicates that the **L2VPN Service Discovery process is In Progress. The status indicator is yellow.**

After the **L2VPN Service Discovery process is complete, the status indicator changes to green, and the Discovery Workflow window indicates that the L2VPN Service Discovery process is Complete, as shown in Figure 4-55.**

Figure 4-55 Discovery Workflow Window with L2VPN Service Discovery Completed



Discovery Workflow

Summary

Step	Status	Start Time	End Time	Log	Summary
Device Discovery	🟩 Complete	2005-09-28 15:47:16	2005-09-28 15:53:38	[View]	[View]
Collect Configuration	🟩 Complete	2005-09-28 15:53:42	2005-09-28 15:56:33	[View]	[View]
Role Assignment	🟩 Complete	2005-09-28 15:56:37	2005-09-28 16:00:59	[View]	[View]
NPC Discovery	🟩 Complete	2005-09-28 16:01:01	2005-09-28 16:03:23	[View]	[View]
L2VPN (Metro Ethernet) Discovery	🟩 Complete	2005-09-28 16:03:33	2005-09-29 15:46:51	[View]	[View]

Progress

Auto Refresh: ☑

Step 8: Commit Discovered Devices and Services to ISC Repository

Click the **Continue** button to commit the discovered devices and services to the ISC repository. Prior to this step, discovery workflow stores the discovered devices and services in a temporary repository, which gets committed to ISC only at the last step of discovery workflow.

Step 9: Create and Run a Collect Config Task for the Discovered Devices

Before you view and edit services, follow these steps to run a Create Config task for the devices:

Note For additional information on the Create Config task, see the“Create” section on page 7-3 for Tasks.

Step 1 On the ISC Start page, select **Monitoring**.

The Monitoring window appears.

Step 2 Select **Task Manager**.

The Tasks window appears.

Step 3 Click the **Create** button and choose **Collect Config** from the pull-down list.

The Create Task window appears.

Step 4 Click the **Next** button.

The Collect Config Task window appears.

Step 5 On the Collect Config task window, follow these steps to create and run a Collect Config task:

a. Click the **Select/Deselect** button.

A dialog window appears, listing the devices that were discovered by the Discovery process.

b. Select all of the devices shown on the list.

c. Click the **Select** button.

The Collect Config Task window appears again.

d. Specify the additional settings for the Collect Config task as required.

e. Click the **Submit** button.

You are now ready to view and edit services as described in the following section, Step 10: View and Edit Services, page 4-79

Step 10: View and Edit Services

After you have successfully completed the MPLS VPN and/or L2VPN Metro Ethernet service creation process, you can view the services that were created and modify them using the service requests editors.

Follow these steps to view the L2VPN services:

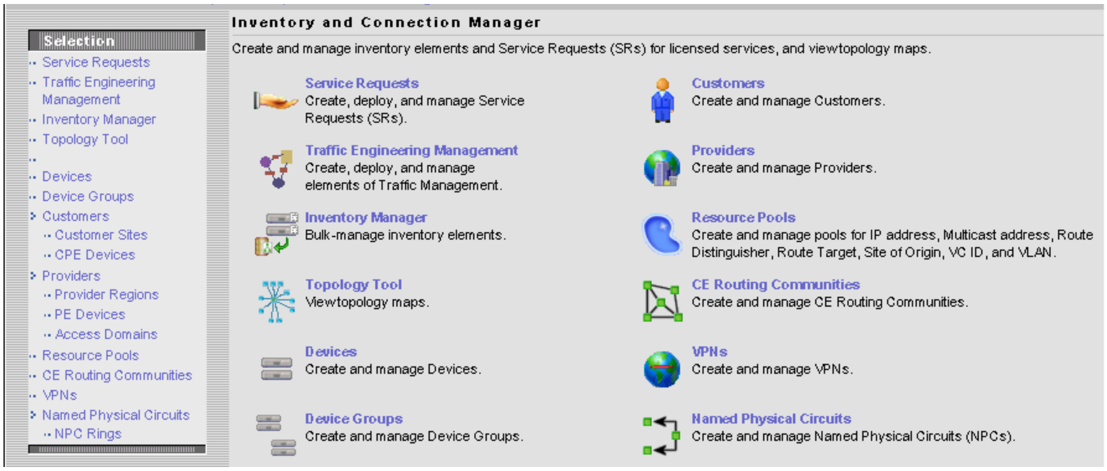
Step 1 If the Service Inventory window is not currently active, click the **Service Inventory** tab.

The Service Inventory window is now active.

Step 2 In the Service Inventory window, click **Service Inventory**.

The Inventory and Connection Manager window appears, as shown in Figure 4-56.

Figure 4-56 Inventory and Connection Manager Window



Inventory and Connection Manager

Create and manage inventory elements and Service Requests (SRs) for licensed services, and viewtopology maps.

Service Requests Create, deploy, and manage Service Requests (SRs).

Customers Create and manage Customers.

Traffic Engineering Management Create, deploy, and manage elements of Traffic Management.

Providers Create and manage Providers.

Inventory Manager Bulk-manage inventory elements.

Resource Pools Create and manage pools for IP address, Multicast address, Route Distinguisher, Route Target, Site of Origin, VC ID, and VLAN.

Topology Tool Viewtopology maps.

CE Routing Communities Create and manage CE Routing Communities.

Devices Create and manage Devices.

VPNs Create and manage VPNs.

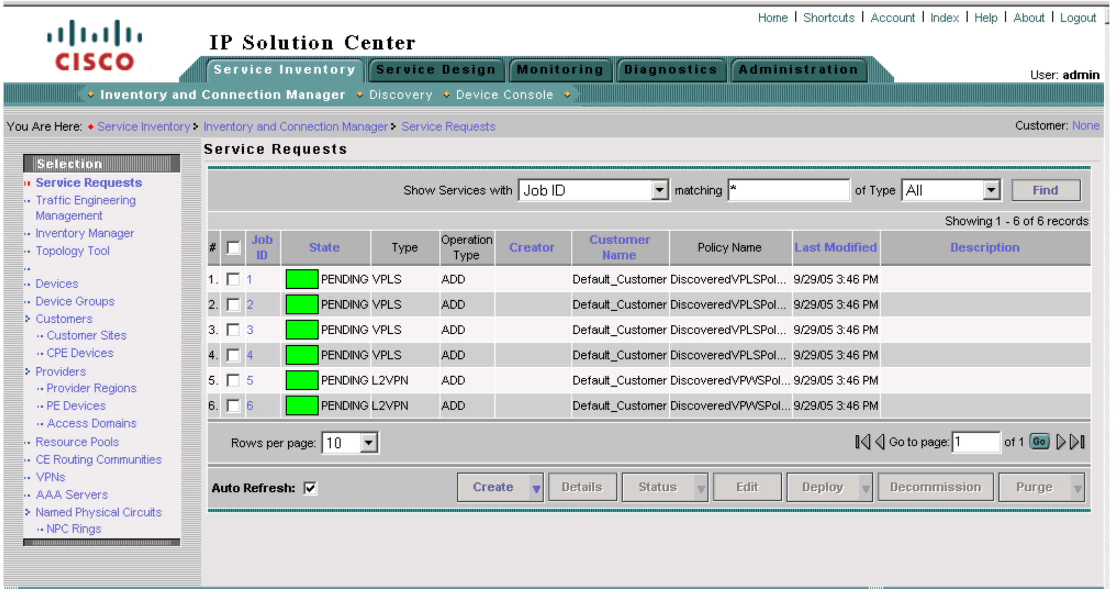
Device Groups Create and manage Device Groups.

Named Physical Circuits Create and manage Named Physical Circuits (NPCs).

Step 3 Click **Service Requests**.

The Service Requests window appears, as shown in Figure 4-57.

Figure 4-57 Service Requests Window



You Are Here: Service Inventory > Inventory and Connection Manager > Service Requests

Customer: None

Service Requests

Show Services with Job ID matching * of Type All

Showing 1 - 6 of 6 records

#	□	Job ID	State	Type	Operation Type	Creator	Customer Name	Policy Name	Last Modified	Description
1.	□	1	🟩 PENDING	VPLS	ADD		Default_Customer	DiscoveredVPLSPol...	9/29/05 3:46 PM	
2.	□	2	🟩 PENDING	VPLS	ADD		Default_Customer	DiscoveredVPLSPol...	9/29/05 3:46 PM	
3.	□	3	🟩 PENDING	VPLS	ADD		Default_Customer	DiscoveredVPLSPol...	9/29/05 3:46 PM	
4.	□	4	🟩 PENDING	VPLS	ADD		Default_Customer	DiscoveredVPLSPol...	9/29/05 3:46 PM	
5.	□	5	🟩 PENDING	L2VPN	ADD		Default_Customer	DiscoveredVPWSPol...	9/29/05 3:46 PM	
6.	□	6	🟩 PENDING	L2VPN	ADD		Default_Customer	DiscoveredVPWSPol...	9/29/05 3:46 PM	

Rows per page: 10

Go to page: 1 of 1

Auto Refresh: ☑

You can modify the service requests shown in the Service Requests window as required.

Note If you need to edit MPLS VPNs as part of this process, see the Splitting a VPN, page 4-59, Creating a VPN, page 4-62, Viewing VPN Link Details, page 4-64, and Saving the MPLS VPNs and Initiating MPLS VPN Service Creation, page 4-65.

Step 4 For detailed information on modifying Service Requests for L2VPN Metro Ethernet networks, see the *Cisco IP Solution Center Metro Ethernet and L2VPN User Guide, 5.0*.

Step 5 For general information on the release, see the *Release Notes for Cisco IP Solution Center, 5.0.1*, provided with the release.