



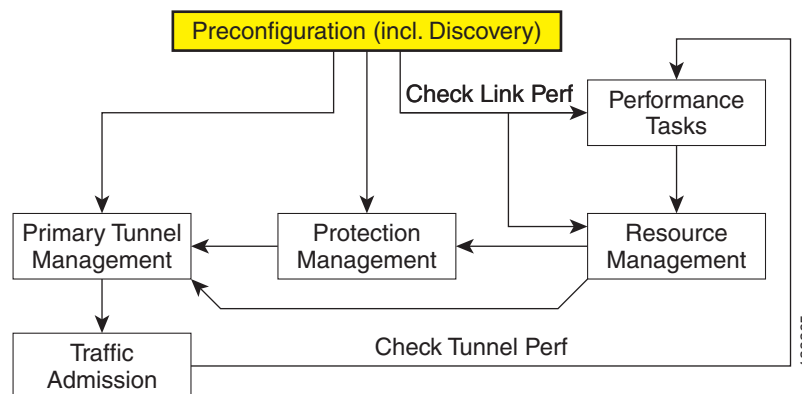
CHAPTER 2

TE Network Discovery

After completing the preconfiguration process and creating a seed router, you can discover the TE network for a particular TE provider. This populates the repository with the network topology. Also, you might need to set up the management interfaces. The necessary steps are described in this chapter.

The highlighted box in [Figure 2-1](#) shows where in TEM the preconfiguration steps takes place.

Figure 2-1 TEM Process Diagram - Preconfiguration



This chapter includes the following sections:

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- [TE Discovery Prerequisites and Limitations, page 2-2](#)
 - [Accessing TE Routers for TE Discovery, page 2-2](#)
 - [Memory Shortage on Large Networks, page 2-2](#)
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Overview

The purpose of the TE discovery process is to populate the repository with the TE topology, TE tunnels, explicit paths, and static routes to tunnels present in the live network.

The TE discovery process uses a seed device to discover the MPLS TE network topology using either Telnet or SSH. All the Traffic Engineering routers in the network should be accessible via their TE ID.

TE Discovery is a schedulable task that can be run once or on a periodic basis. Any inconsistencies between the repository and the network are reported in the Discovery log. The service state information is updated incrementally by logging tunnel in-use Label Switched Paths (LSPs) and updating the service request (SR) state.

TE Discovery Prerequisites and Limitations

The following prerequisites apply mainly to TE discovery.

For an overview of the general TEM prerequisites and limitations, see [Prerequisites and Limitations, page 1-2](#).

Accessing TE Routers for TE Discovery

To successfully run a **TE Discovery** task, the seed router must be directly accessible from the management station.

ALL TE routers must be accessible from the ISC machine via their TE router ID. This is often the loopback IP address, but not always.

For Telnet/SSH, there must be direct Telnet/SSH access from the Cisco IP Solution Center Traffic Management (TEM) management station to each device.

See [Preconfiguration Process Overview, page 1-4](#) for instructions on how to select Telnet or SSH when setting up a seed router.



Note

After performing a TE discovery, it is recommended that you do not manually reconfigure RSVP graceful restart on the device. This affects the synchronization with the database and can cause deployment failure, in which case a new TE discovery needs to be performed.

Memory Shortage on Large Networks

When running TE Discovery on a large network (250+ devices or 5000+ tunnels, for example) or an OutOfMemoryException is encountered, do the following:

-
- Step 1** Choose **Administration > Control Center > Hosts**
- Step 2** Select a host and click the **Config** button.
- Step 3** Select **watchdog > server > worker > java > flags**
- Step 4** Change the first part of the property string, for example to **-Xmx1024m** instead of the default value **-Xmx512m**.
- This increases the heap size of the **TE Discovery** task, which will clear up the `OutOfMemoryException` problem.
- Step 5** Revert the **watchdog.server.worker.java.flags** property back to its original value to reduce the resource usage when no longer needed.
-

**Note**

Alternatively, the same memory increase can be achieved by editing the **watchdog.server.worker.java.flags** property in the **vpnc.properties** file.

IOS XR and Enable Passwords

If an IOS XR device is to be used as a seed device, the enable password should be set in its device record even though IOS XR does not require an enable password, for itself. That way IOS devices in the network, which do require an enable password, can be fully discovered.

When creating an IOS XR device through the **Devices** tab (**Service Inventory > Inventory and Connection Manager > Devices**) to act as a seed device for an initial discovery, it is strictly speaking not necessary to specify the enable password - Cisco ISC TEM will be able to log in and get all the data it needs.

However, if there are other IOS devices in the same network, Cisco ISC TEM will not be able to enter enable mode for those devices. As a result, these are not fully discovered in the sense that the inability to enter enable mode stops Cisco ISC TEM from gathering all the relevant data. These other IOS routers will show up as **'unknown'** devices in the **Devices** window.

Limitations

Simultaneous TE discovery is not supported. Only one user can run a **TE Discovery** task at a time.

Creating a TE Discovery Task

To create a TE Discovery task on the TE network, use the following steps:

-
- Step 1** Choose **Monitoring > Task Manager**. The window in [Figure 2-2](#) appears.

Figure 2-2 Tasks

The screenshot shows a web interface for managing tasks. At the top, there is a search bar with the text "Show Tasks with Name matching * of Type *" and a "Find" button. Below the search bar, it says "Showing 1 - 1 of 1 record". The main part of the interface is a table with the following columns: #, Task Name, Type, Targets, Schedule, User Name, and Created on. There is one row in the table with the following data: # 1, Task Name "TE Discovery 2008-09-03 17:24:34.022", Type "TE Discovery", Targets (empty), Schedule "Single run at 2008-09-03 17:24:00.0", User Name "admin", and Created on "2008-09-03 17:24:37.261". Below the table, there is a "Rows per page" dropdown set to "10" and a "Go to page: 1 of 1" navigation bar. At the bottom, there is an "Auto Refresh" checkbox which is checked, and a row of buttons: "Create", "Audit", "Details", "Schedules", "Logs", and "Delete".

#	Task Name	Type	Targets	Schedule	User Name	Created on
1.	TE Discovery 2008-09-03 17:24:34.022	TE Discovery		Single run at 2008-09-03 17:24:00.0	admin	2008-09-03 17:24:37.261

Step 2 Create a new task by selecting **Create > TE Discovery**. The window in [Figure 2-3](#) appears.

Figure 2-3 Create TE Discovery Task (Step 1)

The screenshot shows a "Create Task" dialog box. It has three input fields: "Name*" with the value "TE Discovery 2008-09-18 00:21:45.034", "Type" with the value "TE Discovery", and "Description" with the value "Created on 2008-09-18 00:21:45.034". Below the fields, there is a note: "Note: * - Required Field". At the bottom of the dialog, there is a progress indicator "- Step 1 of 2 -" and a set of navigation buttons: "< Back", "Next >", "Finish", and "Cancel".

Step 3 Optionally alter the **Name** and/or **Description** fields and click **Next**. The Select TE Provider window in [Figure 2-4](#) appears.

Figure 2-4 Select TE Provider

Select TE Provider

Show TE Providers with Name matching *

Showing 1 - 1 of 1 record

#	Provider	PE Region Name
1.	<input checked="" type="radio"/> cisco	scotland

Rows per page: 10

- Step 1 of 4 -

Step 4 Select a TE provider and click **Next**.

The Select Seed Device window in [Figure 2-5](#) appears. Non-Cisco devices, if any, are excluded from the list.

Figure 2-5 Select Seed Device

Select Seed Device

Show Devices with Device Name matching *

Showing 1 - 10 of 22 records

#	<input type="radio"/>	Device Name	Management IP Address	Type
1.	<input type="radio"/>	pe1		Cisco IOS Device
2.	<input type="radio"/>	pe3		Cisco IOS Device
3.	<input type="radio"/>	sw2		Cisco IOS Device
4.	<input type="radio"/>	sw3		Cisco IOS Device
5.	<input type="radio"/>	sw4		Cisco IOS Device
6.	<input type="radio"/>	ce3		Cisco IOS Device
7.	<input type="radio"/>	ce8		Cisco IOS Device
8.	<input type="radio"/>	ce13		Cisco IOS Device
9.	<input checked="" type="radio"/>	isctmp1		Cisco IOS Device
10.	<input type="radio"/>	isctmp11		Cisco IOS-XR Device

Rows per page: 10

- Step 2 of 4 -

Step 5 Select the seed device for discovering the network and click **Next**. The Task Schedules window in [Figure 2-6](#) appears.

Figure 2-6 TE Discovery Task Schedules Window Before Scheduling

Task Schedules

Showing 0 of 0 records

#	Schedule	Start Date and Time	End Date and Time	Max Runs	Max Instances
Showing 0 of 0 records					

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

Now Create Delete

- Step 3 of 4 - < Back Next > Finish Cancel

Step 6 Create a task schedule in one of two ways:

- Click **Now** to schedule the task to run immediately, in which case the schedule information is automatically filled into the Task Schedules list (Figure 2-8).
- Click **Create** to create a scheduler for this task, in which case the Task Schedule window in Figure 2-7 appears.

Figure 2-7 Task Schedule

Task Schedule

Single run: Now Once

Periodic Run: Minute Hourly Daily Weekly Monthly

Periodic Run Attributes

Run Interval:

Run Limits:

Start Date and Time

Date: September 19 2008

Time: 9:20 AM

End Date and Time (Default is unlimited)

Date: Month Day Year

Time: Hour Min AM

OK Cancel

Step 7 In the Task Schedule window, make your selections to define when and how often the task should be run.

**Note**

The default setting is to schedule a single **TE Discovery** task to take place immediately (“**Now**”).

Step 8

Click **OK**.

The scheduled task should now appear in the Task Schedules table as shown in [Figure 2-8](#).

Figure 2-8 TE Discovery Task Schedules Window After Scheduling

The screenshot shows the 'Task Schedules' window. At the top right, it says 'Showing 1 - 1 of 1 record'. Below this is a table with the following data:

#	<input type="checkbox"/>	Schedule	Start Date and Time	End Date and Time	Max Runs	Max Instances
1.	<input type="checkbox"/>	Single run at 2008-09-19 09:20:00.0	2008-09-19 09:20:00.0	not applicable	unlimited	unlimited

Below the table, there is a 'Rows per page' dropdown set to '10' and a 'Go to page: 1 of 1' field with a 'Go' button. At the bottom right of the table area are three buttons: 'Now', 'Create', and 'Delete'. At the bottom of the window, there is a navigation bar with buttons: '< Back', 'Next >', 'Finish', and 'Cancel'. The status bar at the bottom left says '- Step 3 of 4 -' and the ID '205101' is on the right.

Step 9

Click **Next**. A summary of the scheduled task in [Figure 2-9](#) appears.

Figure 2-9 Discovery Task Summary

The screenshot shows the 'Discovery Task Summary' window. It contains a table with the following data:

Name:	TE Discovery 2008-09-19 09:17:05.149
TE Provider:	cisco
Seed TE Router:	isctmp6
Schedules:	Single run at 2008-09-19 09:20:00.0

At the bottom of the window, there is a navigation bar with buttons: '< Back', 'Next >', 'Finish', and 'Cancel'. The status bar at the bottom left says '- Step 4 of 4 -' and the ID '205102' is on the right.

Step 10 Click **Finish**. This will add the task to the list of created tasks in the Tasks window ([Figure 2-2](#)).

Managing Per Area Discovery

Before running a per area TE discovery, it is helpful to understand how multiple OSPF areas are managed by TEM.

For background information on this topic, see [Multiple OSPF Areas, page F-5](#).

This section describes the following:

- [Performing a Per Area TE Discovery, page 2-8](#)
- [Running a Per Area TE Discovery Through an ABR, page 2-8](#).

Performing a Per Area TE Discovery

When a TE Discovery is run against an area with a selected TE provider, all tunnels and explicit paths associated with that area will be imported into the ISC database.

To initiate a per area TE discovery:

- Step 1** Create an ISC Provider.
 - Step 2** Create an ISC Region.
 - Step 3** Create a TE Provider.
 - Step 4** Create a seed device from the Devices window.
 - Step 5** Choose Monitoring > Task Manager > Create > TE Discover.
Specify a name for the TE Discovery or accept the default and press **Next**.
 - Step 6** Select a TE Provider and press **Next**.
 - Step 7** Select a seed device and press **Next**.
 - Step 8** Select a schedule for the TE Discovery and press **Next**.
 - Step 9** Review the summary of the discovery task.
If it is acceptable, press **Finish** to start the TE Discovery process.
-

Running a Per Area TE Discovery Through an ABR

If no area identifier is specified in the TE provider configuration and the seed device is an ABR, TE Discovery will abort with the warning message shown in [Figure 2-10](#) informing you to either specify an area identifier for the TE provider or use a non-ABR device as the seed.

Figure 2-10 TE Discovery Through an ABR with no TE Area Identifier Specified

Task Log

Log Level: Component:

Date	Level	Component	Message
2008-10-22 15:56:31	WARNING	repository.rbac	Thread RBAC enabled flag is set to false.
2008-10-22 15:56:41	SEVERE	DiscoveryTask	Seed device 192.168.1.139 has TE enabled in multiple IGP areas. This configuration is unsupported with the specified TE Provider, aborting discovery. Retry discovery from a seed device with TE enabled in one IGP area or specify the area you wish to be discovered by editing the TE Provider.
2008-10-22 15:56:41	WARNING	DiscoveryTask	Fatal Error Encountered, aborting Discovery...
2008-10-22 15:56:41	SEVERE	DiscoveryTask	Discovery FAILURE.
2008-10-22 15:56:41	WARNING	repository.rbac	Thread RBAC enabled flag is set to true.

Verifying a TE Discovery Task

The result of running the **TE Discovery** task can be assessed in four ways:

- **Task Logs**—View a summary log of any changes that have occurred in the network.
- **TE Topology**—Display the latest TE Topology from the repository.
- **View Network Element Types**—In the Traffic Engineering Management GUI, go to **TE Nodes**, **TE Links**, **TE Primary Tunnels**, and so on to verify the state of specific network element types.
- Viewing the state of discovered devices—Go to the Service Requests window to examine whether the state of the discovered devices is as expected.

Task Logs

The TE Discovery log captures the state of the network and compares it with the most recent snapshot of the repository.

To view the task log for a **TE Discovery** task, use the following steps:

-
- Step 1** Choose **Monitoring > Task Manager**.
- Step 2** Select **Logs** in the table of contents on the left side of the Tasks window.
- The Task Logs window in [Figure 2-11](#) appears.

Figure 2-11 Task Logs - TE Discovery

Task Logs					
Show Runtime Tasks with Task Name matching <input type="text" value="*"/> <input type="button" value="Find"/>					
Showing 1 - 6 of 6 records					
#	Runtime Task Name	Action	Start Time	End Time	Status
1.	<input checked="" type="checkbox"/> TE Discovery 2005-11-02 15:50:25.705_Wed_Nov_02_15:50:45_PST_2005_4	Discovery Task	2005-11-02 15:50:46.47	2005-11-02 15:55:01.306	Completed successfully
2.	<input type="checkbox"/> TE Discovery 2005-11-02 15:48:32.554_Wed_Nov_02_15:48:54_PST_2005_3	Discovery Task	2005-11-02 15:48:55.386	2005-11-02 15:49:05.346	Failed
3.	<input type="checkbox"/> Deploy Primary SR-ID 8 2005-10-31 12:20:45.471_Mon_Oct_31_12:20:49_PST_2005_2	ConfigAudit	2005-10-31 12:21:01.944	2005-10-31 12:22:17.846	Completed with 1 errors
4.	<input type="checkbox"/> Deploy Primary SR-ID 8 2005-10-31 12:20:45.471_Mon_Oct_31_12:20:49_PST_2005_2	Deployment Phase C	2005-10-31 12:21:00.421	2005-10-31 12:21:01.92	Completed successfully
5.	<input type="checkbox"/> Deploy Primary SR-ID 8 2005-10-31 12:20:45.471_Mon_Oct_31_12:20:49_PST_2005_2	Deployment Phase B	2005-10-31 12:20:59.453	2005-10-31 12:21:00.398	Completed successfully
6.	<input type="checkbox"/> Deploy Primary SR-ID 8 2005-10-31 12:20:45.471_Mon_Oct_31_12:20:49_PST_2005_2	Deployment Phase A	2005-10-31 12:20:51.009	2005-10-31 12:20:59.425	Completed successfully

Rows per page: 10

Auto Refresh:

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For an explanation of the various window elements, see [TE Task Logs, page B-67](#).

The status of each task is shown in **Status** column. This updates automatically and indicates when the TE Discovery process is complete.

If the task is not completed and **Auto Refresh** is selected, the table continues to update periodically until it is completed.

Step 3 To view the log for a particular task, click the log name in the **Action** column.

A copy of a TE Discovery log is shown in the following screenshots, starting with [Figure 2-12](#).



Note To find the summary of changes in the network depicted in the following screenshots, scroll to the bottom of the log.

Figure 2-12 TE Discovery Task Log - Devices/Interfaces

```
[Step 1 of 6] Process Device(s)/Interface(s)

ADD: Device(s)/Interface(s) to Repository:

SKIP: Matching Device(s)/Interface(s) in Repository:

1. isctmpl2., TEID: 192.168.118.168, Vendor: Cisco
1.1. POS0/1/0/1 -- 10.2.4.13

2. isctmpl3., TEID: 192.168.118.171, Vendor: Cisco
2.1. GigabitEthernet2/0/0 -- 10.2.4.46
2.2. GigabitEthernet1/0/0 -- 10.2.4.50

3. isctmpl., TEID: 192.168.118.176, Vendor: Cisco
3.1. FastEthernet3/1/0 -- 10.2.3.93
3.2. FastEthernet1/1/0 -- 10.2.2.110
3.3. FastEthernet3/0/1 -- 10.2.3.89
3.4. FastEthernet2/1/0 -- 10.2.3.54
3.5. FastEthernet2/1/1 -- 10.2.3.57
```

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Figure 2-13 TE Discovery Task Log - Links

```
[Step 2 of 6] Process Link(s)

ADD: Link(s) to Repository:

SKIP: Matching Link(s) in Repository:

1. 10.2.4.6 -- 10.2.4.5
2. 10.2.4.10 -- 10.2.4.9
3. 10.2.4.14 -- 10.2.4.13
4. 10.2.4.22 -- 10.2.4.21
5. 10.2.4.49 -- 10.2.4.50
6. 10.2.4.29 -- 10.2.4.30
7. 10.2.4.46 -- 10.2.4.45
8. 10.2.4.53 -- 10.2.4.54
9. 10.2.3.93 -- 10.2.3.94
10. 10.2.2.161 -- 10.2.2.174
11. 10.2.2.110 -- 10.2.2.97
12. 10.2.2.129 -- 10.2.2.142
13. 10.2.2.145 -- 10.2.2.158
```

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Figure 2-14 TE Discovery Task Log - Explicit Paths

```
[Step 3 of 6] Process Explicit Path(s)

ADD: Explicit Path(s) to Repository:

1. isctmp11.
1.1. p11-p8: 10.2.4.5 :
1.2. p11-p12-p7-p8: 10.2.4.14 : 10.2.4.29 : 10.2.3.49 :
1.3. isctmp11-isctmp8-1: 10.2.4.13 : 10.2.4.30 : 10.2.2.126 :
1.4. isctmp11-isctmp12-1: 10.2.4.9 :

2. isctmp10.
2.1. p10-p12-p11: 10.2.4.21 : 10.2.4.10 :
2.2. p10-p12-p7-p1: 10.2.4.21 : 10.2.4.30 : 10.2.2.110 :
2.3. loopback-p10-p12-p11: 192.168.118.168 : 192.168.118.166 :

3. isctmp12.
3.1. p12-p7-p8-p11: 10.2.4.30 : 10.2.2.126 : 10.2.4.6 :
3.2. isctmp12-isctmp5-1: 10.2.4.50 : 10.2.4.54 : 10.2.2.81 :

4. isctmp8.
4.1. isctmp8-isctmp7-1: 10.2.2.113 :
```

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Figure 2-15 TE Discovery Task Log - Primary Tunnels

```
[Step 4 of 6] Process Primary Tunnel(s)

ADD: Primary Tunnel(s) to Repository:

1. tunnel-te2 : isctmp11 -- isctmp10
2. tunnel-tel000 : isctmp11 -- isctmp1
3. tunnel-tel1 : isctmp10 -- isctmp6
4. tunnel-te2 : isctmp10 -- isctmp1
5. tunnel-tel33 : isctmp12 -- isctmp7
6. tunnel-te212 : isctmp12 -- isctmp7
7. tunnel-tel000 : isctmp12 -- isctmp2
8. tunnel-tel001 : isctmp12 -- isctmp2
9. Tunnel2 : isctmp1 -- isctmp8
10. Tunnel3 : isctmp1 -- isctmp5
11. Tunnel138 : isctmp1 -- isctmp3
12. Tunnel300 : isctmp1 -- isctmp2
13. Tunnel1000 : isctmp1 -- isctmp11
14. Tunnel2000 : isctmp1 -- isctmp2

SKIP: Matching Primary Tunnel(s) in Repository:
```

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Figure 2-16 TE Discovery Task Log - Backup Tunnels

```
[Step 5 of 6] Process Backup Tunnel(s)

ADD: Backup Tunnel(s) to Repository:

    1. tunnel-te1002 : isctmp11 -- isctmp8
    2. tunnel-te1005 : isctmp11 -- isctmp12
    3. tunnel-te1000 : isctmp12 -- isctmp5

SKIP: Matching Backup Tunnel(s) in Repository:

MISSING: Backup Tunnel(s) from Network but Found in Repository:

    1. tunnel-te3 : isctmp11 -- isctmp12
    2. tunnel-te1001 : isctmp11 -- isctmp8
    3. Tunnel2 : isctmp13 -- isctmp12
    4. Tunnel1 : isctmp1 -- isctmp2
    5. Tunnel4 : isctmp1 -- isctmp2
    6. Tunnel5 : isctmp1 -- isctmp3
```

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Figure 2-17 TE Discovery Task Log - Static Routes

```
[Step 6 of 6] Process Static Route(s)

ADD: Static Route(s) to Repository:

    1. isctmp11
    1.1. 1.2.3.4 [255.255.255.255] -- tunnel-te1000
    1.2. 10.2.4.5 [255.255.255.255] -- tunnel-te1004

SKIP: Matching Static Route(s) in Repository:

MISSING: Static Route(s) from Network but Found in Repository:

    1. isctmp10
    1.1. 3.3.3.3 [255.255.255.255] -- tunnel-tel -- distance -- 10

    2. isctmp1
    2.1. 3.3.3.3 [255.255.255.255] -- Tunnel2 -- distance -- 10
```

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The TE Discovery task log window is organized into sections that each describes particular events in the TE network:

- either the state of the network as recorded in the repository the first time a **TE Discovery** task is run
- or changes in the network since the last time the **TE Discovery** task was run (repository delta).

The summary of changes in the network is reported in six steps:

1. Devices/Interfaces (Figure 2-12)
2. Links (Figure 2-13)
3. Explicit paths (Figure 2-14)
4. Primary tunnels (Figure 2-15)
5. Backup tunnels (Figure 2-16)
6. Static routes (Figure 2-17).

As seen in the figures, in each step a log table reports the changes in the following reporting categories:

- **ADD**—This section lists those elements that the **TE Discovery** task added to the repository. At the initial discovery, all elements should be in the ADD section as nothing existed in the repository beforehand. With every subsequent discovery, the ADD section will list elements that have been added to the network since the discovery independent of Cisco ISC TEM. Thus, the ADD function is synchronizing the repository with the network by adding these elements.
- **SKIP**—This section lists those elements that exist both in the network and in the repository and have all attributes equal. This shows that these elements have not been deleted or modified independently of Cisco ISC TEM.
- **MISSING**—This section lists those elements that exist in the repository but do not exist in the network, implying that they have been deleted independently of Cisco ISC TEM. This indicates that more investigation is required to correct the discrepancy.
- **MISMATCH**—This section lists those elements that exist both in the network and in the repository, but have one or more attributes that are not equal. This implies that these elements have been modified independently of Cisco ISC TEM and that you need to investigate and correct the problem.
- **MODIFY**—This section lists any network elements that have had attributes in the repository modified since the previous run of the **TE Discovery** task to synchronize with the network. These are usually dynamic attributes, such as the time when a tunnel was set up.

Step 4 Click **Return to Logs** to quit the current log with the option to open another log.

TE Topology

The TE Topology tool provides a visual snapshot of the current state of the network. It cannot be used to determine changes that have taken place in the network.

The steps required to generate a topology graph of the network are described in [Chapter 10, “TE Topology.”](#)

View Network Element Types

Another way to check the state of the network after running TE discovery is to go to the Traffic Engineering Management Services window and select the type of elements you want to verify.

For example, to check the status of the nodes after running TE discovery, choose **Service Inventory > Inventory and Connection Manager > Traffic Engineering Management > TE Nodes**. Look at the updated list of TE nodes to assess which nodes are in the network.

Do the same for TE Links, TE Primary Tunnels, TE Backup Tunnels, and so on.

Setting Up Management Interfaces

Before commencing tunnel management operations, you need to set up management interfaces. However, this step is only necessary if the network devices are not accessible by the hostname from the management station.

For a detailed description of how to set up management interfaces on specific devices, see the [Cisco IP Solution Center Infrastructure Reference, 5.1](#) in the section on creating devices.

MPLS-TE Management Process

The MPLS-TE management process involves the following steps:

1. Enable MPLS-TE on the network devices and make sure that the IP addresses used as the devices TE IDs are accessible from the management station (this step is not supported by Cisco ISC TEM).
2. Prepare the repository for discovering MPLS-TE network.
3. Set up management interfaces for the discovered devices or update the server host file with resolution for all discovered devices. Again, this is not needed if the hostnames are already accessible from the management station.
4. Discover the MPLS-TE network.

You will then be in a position to run the other MPLS-TE functions available in Cisco ISC TEM.

**Note**

When the repository is empty, or when the management IP addresses are not configured for current devices in the TE network, make sure that the router MPLS TE ID can be reached from the management station. In other words, the TE discovery process does not support seed passthrough.

Configuring Ethernet Links

Only point-to-point links are supported in Cisco ISC TEM. POS links are point-to-point by default but otherwise Ethernet links need to be configured as point-to-point.

For IOS, enter the following command:

```
(config-if)# ip ospf network point-to-point
```

For IOS XR, enter the following command:

```
# router ospf <id> area <area identifier> interface <name> network point-to-point
```