



CHAPTER 1

Getting Started

This guide contains a detailed description of the Cisco IP Solution Center Traffic Management (TEM) product, including the various features, the GUI, and the step-by-step processes needed to perform various traffic engineering management tasks.

To get an overview of TEM and an introduction to some of the terminology used, see [Appendix F, “Background and Concepts.”](#)

This chapter describes the installation procedure for TEM. The general installation procedure for Cisco IP Solutions Center (ISC) is described in the *Cisco IP Solution Center Installation Guide, 5.1*.

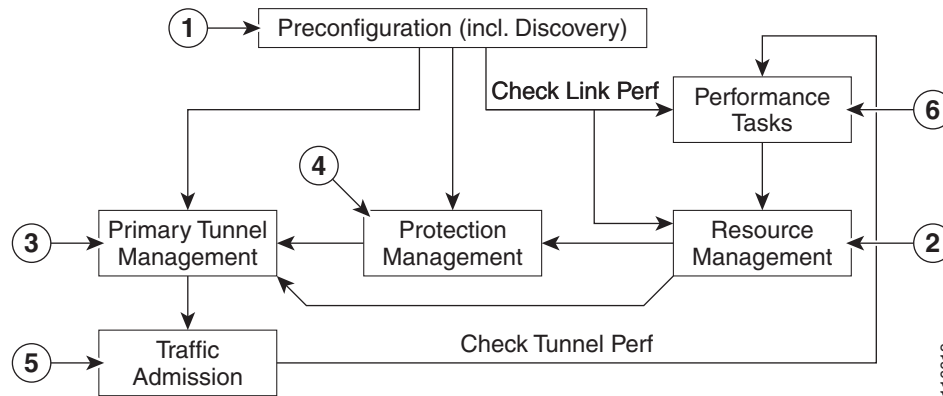
This chapter includes the following sections:

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Process Overview

The main components and flows in TEM are shown in [Figure 1-1](#).

Figure 1-1 Main Process Flows in Cisco ISC TEM



The illustration includes the following components:

1. **Preconfiguration**—Sets up key parameters that enable the system to collect TE network information (TE Discovery) and subsequently deploy TE configurations on the chosen network. (See [Chapter 1, “Getting Started.”](#))
2. **Resource Management**—Tuning of certain properties on the TE interfaces to optimize the tunnel placement. (See [Chapter 3, “TE Resource Management.”](#))
3. **Primary Tunnel Management**—Create and manage primary tunnels, either unmanaged (see [Chapter 4, “Basic Tunnel Management”](#)) or managed. (see [Chapter 4, “Basic Tunnel Management”](#) or [Chapter 5, “Advanced Primary Tunnel Management.”](#))
4. **Protection Management**—Protect selected elements in the network (links, routers, or SRLGs) against failure. (See [Chapter 6, “Protection Planning.”](#))
5. **Traffic admission**—Assign traffic to traffic-engineered tunnels. (See [Chapter 7, “Traffic Admission.”](#))
6. **Performance Tasks**—Calculates interface/tunnel bandwidth utilization using the Simple Network Management Protocol (SNMP). (See [Chapter 8, “Administration.”](#))

Prerequisites and Limitations

The current release of TEM involves certain prerequisites and limitations, which are described in this section.

See the [Cisco IP Solution Center Installation Guide, 5.1](#) for general system recommendations.

General Limitations

Concurrent use of TEM is now supported (see [Multiple Concurrent Users, page F-4](#)), however multiple browsers on the same machine are still not recommended due to a limitation in Browser Session Attributes.

Let issued service requests finish deployment before issuing other service requests to avoid conflicts. This is described in more detail in the tunnel provisioning chapters.

TEM manages a single OSPF area or IS-IS level. TEM also supports multiple OSPF areas, however it does not discover tunnels between areas. Each OSPF area is mapped to a TE provider and is discovered area by area independently.

TEM only supports MPLS-TE topology with point-to-point links.

Feature-Specific Prerequisites and Limitations

Some features might only be available with a particular license. In addition, the number of nodes provided by the license limits the size of the network. For more information, see the [Cisco IP Solution Center Infrastructure Reference, 5.1](#).

A number of specific requirements are associated with the **TE Discovery** task. These are described in [TE Discovery Prerequisites and Limitations, page 2-2](#).

Concurrent use is supported in the Planning portion of the current implementation of TEM.

JRE version 1.6.0_07 or higher should be installed on the client computer for launching Java applications and Applets. This can be done via Java's Control Panel. If you do not already have Java installed, you can use the links on the Topology Tool page to install the version that is bundled with ISC.

If your repository predates the ISC 4.1 release and has been upgraded to a 4.1 or later repository, you need to run a TE Discovery task to collect software version information from the devices before deploying service requests.

Non-Cisco Devices and ISC TEM

TEM does not manage non-Cisco devices and ISC cannot be used to provision them.

ISC will, however, discover non-Cisco devices and store them in the repository. Tunnels can be run through these devices, the bandwidth consumed can be accounted for, but the devices are not otherwise managed by ISC. TE tunnels originating from non-Cisco devices will not be discovered.

Sorting can be performed on different attributes in various parts of the TEM GUI. However, due to the added support for non-Cisco devices, sorting cannot be performed on Device Name and MPLS TE ID in the TE Nodes List window.

Supported Platforms

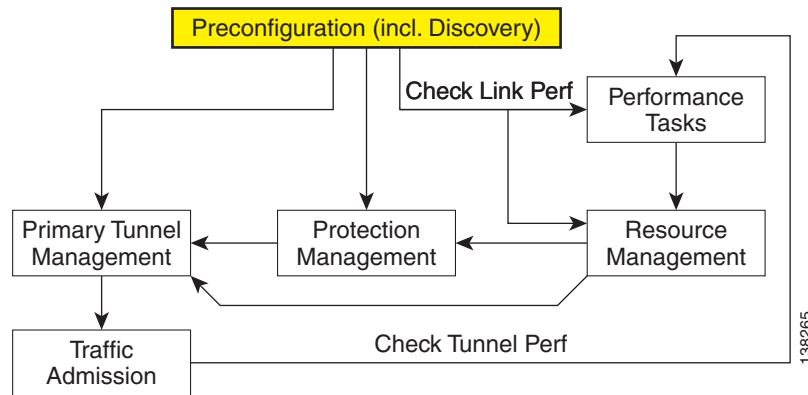
For supported devices and IOS platforms, see the [Cisco IP Solution Center Installation Guide, 5.1](#).

Preconfiguration Process Overview

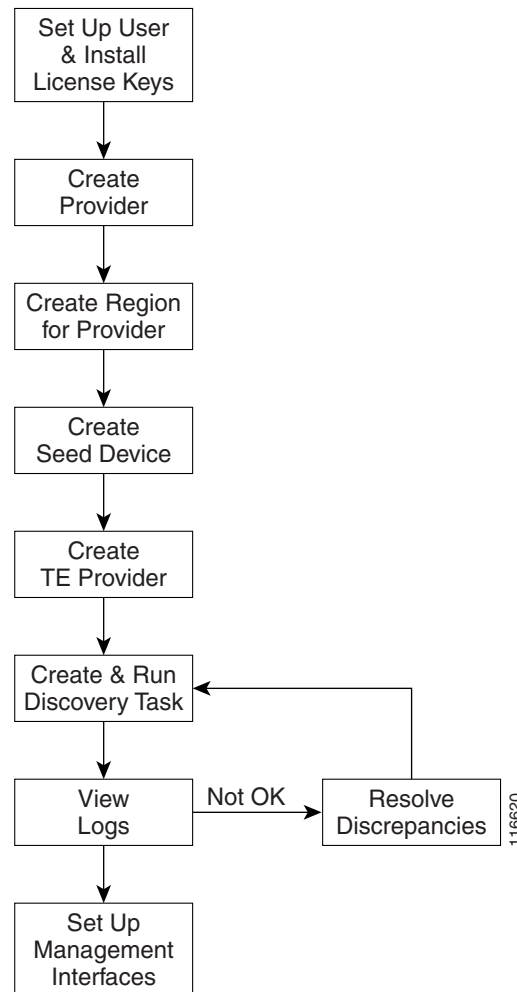
The preconfiguration process sets up key parameters that enable the system to collect TE network information and subsequently deploy TE configurations on the chosen network.

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

Figure 1-2 TEM Process Diagram - Preconfiguration



The different steps in the preconfiguration process is provided in [Figure 1-3](#).

Figure 1-3 Preconfiguration Process

Before commencing the preconfiguration process, MPLS-TE needs to be enabled on the network devices by making sure that the IP addresses used as devices' TE IDs are accessible from the management station (this step is not supported by ISC TEM).

The preconfiguration process includes the following steps:

1. **Set up new user and install license keys**—To run the TEM blade of ISC, it is necessary to create a new user and install license keys. These keys allow you to view and manage the TE tunnels and resources using ISC. (See [ISC TEM Setup and Installation, page 1-6](#))
2. **Create a provider**—The provider is a concept designed to allow many different operators to work on TEM simultaneously, each working on different networks. Thus, each provider has to be defined and used as a reference operator for future work on the system. (To create a provider, see the [Cisco IP Solution Center Infrastructure Reference, 5.1.](#))
3. **Create a region for the provider**—The region is important because a single provider could have multiple networks. The region is used as a further level of differentiation to allow for such circumstances. (To create a region, see the [Cisco IP Solution Center Infrastructure Reference, 5.1.](#))

4. **Create a seed device**—This IOS or IOS XR device will be the seed router for TE Discovery. The network discovery process uses the seed router as an initial communication point to discover the MPLS TE network topology. (To create a seed router, see the [Cisco IP Solution Center Infrastructure Reference, 5.1.](#))
5. **Create a TE Provider**—Providers can be defined as TE provider, if they are supporting MPLS TE in their network. To enable a TE network to be managed, it is necessary to create a TE provider. All TE related data associated with a given network is stored under a unique TE provider. A provider and region uniquely define a TE provider (See [Creating a TE Provider, page 1-7.](#))
6. **Run a TE Discovery Task**—Discover the TE network for a particular TE provider to populate the repository with a view to creating primary and backup tunnels. (See [Chapter 2, “TE Network Discovery”.](#))
7. **Set Up Management Interfaces**—Set up management interfaces for discovered devices or update server host file with resolution for all discovered devices. This step is only necessary if the devices in the TE network are not accessible via their hostnames (See [Setting Up Management Interfaces, page 2-13.](#))

**Note**

If Telnet is selected to communicate with the seed router, Telnet must also be used for the other network devices. Likewise, if SSH is selected for the seed router, SSH must be used for all other devices.

ISC TEM Setup and Installation

Before setting up TEM, the ISC software must be installed. To do so, see the [Cisco IP Solution Center Installation Guide, 5.1.](#)

To set up a new TEM user, one or more users with a TE role must be created. For step by step instructions, see the [Cisco IP Solution Center Infrastructure Reference, 5.1.](#)

Licensing information, including the TEM licensing options and the procedure needed to install licenses is described in the [Cisco IP Solution Center Infrastructure Reference, 5.1.](#)

Editing DCPL Properties (Optional)

The ISC Dynamic Component Properties Library (DCPL) includes a wide variety of properties that are accessible from the GUI, some of which can be modified.

The various DCPL properties in ISC, including those pertaining to TEM, and the process for editing these properties are described in the [Cisco IP Solution Center Infrastructure Reference, 5.1.](#)

**Warning**

Do not attempt to modify the DCPL properties unless you fully understand the implications.

In the ISC GUI, the DCPL properties are found in **Administration > Control Center > Hosts**. Select a check box for a specific host and click the **Config** button.

The DCPL properties pertaining to TEM are found in the following folders:

- **Provisioning > Service > TE**
- **TE**
- **TE Topology**

Creating a TE Provider

Before TE Discovery or any manipulation of TE data can take place, at least one TE provider has to be created. For example, an OSPF area can be assigned as a TE provider. Prior to this, a provider and a region for that provider must have been set up (see [Preconfiguration Process Overview, page 1-4](#)).

One region can be assigned as the default region as a place for discovered routers. These routers can then subsequently be placed in any region. For more information, see [Multiple OSPF Areas, page F-5](#).

To create a TE provider, use the following steps:

- Step 1** Choose **Service Inventory > Inventory and Connection Manager > Traffic Engineering Management**.

The Traffic Engineering Management Services window shown in [Figure 1-4](#) appears.

Figure 1-4 Traffic Engineering Management Services

The screenshot displays the Cisco IP Solution Center interface for Traffic Engineering Management Services. The top navigation bar includes 'Service Inventory', 'Service Design', 'Monitoring', 'Diagnostics', and 'Administration'. The current path is 'Inventory and Connection Manager > Discovery > Device Console'. The main content area is titled 'Traffic Engineering Management Services' and features a 'TE Provider Name' field with the value 'cisco'. Below this, there are two columns of service request elements and forms, each with a small icon and a description. The left column includes 'TE Providers', 'TE Topology', 'TE Nodes', 'TE Links', 'TE SRLGs', 'TE Explicit Paths', and 'TE Protected Elements'. The right column includes 'Create Managed TE Tunnel', 'Create Unmanaged TE Tunnel', 'Create TE Backup Tunnel', and 'TE Traffic Admission'. A note at the bottom left states 'Note: * - Required Field'. The user 'admin' is logged in, and the customer is 'None'.

Step 2 Click **TE Providers**.

The TE Providers window appears. For an explanation of the various window elements, see the “[TE Providers](#)” section on page B-3.

Step 3 Click **Create** to create a TE provider.

The Create/Edit TE Provider window appears. For an explanation of the various window elements, see [Create/Edit TE Provider](#), page B-3.

Step 4 In the **TE Provider** field, enter a name for the new TE provider.**Step 5** To select a provider to be this TE provider, click the **Select** button next to the **Provider** field.

The Select Provider window appears.

Step 6 Select the desired provider using the radio buttons or search for a provider with search criteria matching a provider name and click **Find**.**Step 7** Click **Select** to select the desired provider.

The Select Provider window closes. The selected provider name is displayed in the **Provider** field.

Step 8 In the **TE Area** field, specify the number of the OSPF area to act as TE area.

Both dot notation and decimal notation are supported for the area identifier.



Note The **TE Area** field can be left blank if the seed router used for TE Discovery is not an Area Border Router, and it will be automatically populated on discovery.

Depending on the seed router used for TE Discovery, the area identifier should be set as follows:

- **Seed router is an ABR:** The area identifier field in TE provider must be set to indicate which of the two or more areas on the ABR is to be discovered.
- **Seed router is NOT an ABR:** Leave blank.



Note If you do not set the Area Identifier in TE Provider, TE Discovery will set it. After it is set, it cannot be changed.

Step 9 Add primary and backup route generation parameters.

When the FRR (Fast Re-Route) protection type is equal to Sub Pool, the backup tunnels generated by the tool will protect only the sub pool primary tunnels. When it is equal to Any Pool, the backup tunnels generated by the tool will protect both sub pool and global pool primary tunnels.

For more information on Fast Re-Route (FRR) protection pools, see [Bandwidth Pools](#), page F-6.

Step 10 Fill in the remaining required fields (marked ‘*’) and any optional fields as desired.**Step 11** For the required **Default Region for TE Devices** field, click the corresponding **Select** button.

The Region for Create TE Provider window appears.

Step 12 Select the desired region using the radio buttons.**Step 13** Click **Select** to select the desired default region.

The Region for Create TE Provider window closes. The selected region name is displayed in the **Default Region for TE Devices** field.

Step 14 For the optional **Customer for Primary Tunnels** field, click the corresponding **Select** button.

The Customer for Create TE Provider window appears.

Step 15 If desired, select a customer using the radio buttons or search for a customer by entering customer search criteria in the **Show Customers with Customer Name matching** field and click **Find**.

Step 16 Click **Select** to select the desired customer.

The Select Customer for Create TE Provider window closes. The selected customer name is displayed in the **Customer for Primary Tunnels** field of the Create/Edit TE Provider window.

Step 17 Click **Save**.

The created TE provider appears in the TE Provider window and can now be used to perform TE discovery and other TE functions.

To switch between TE providers, go to the top of the Traffic Engineering Management Services window ([Figure 1-4](#)) and click the **Select** button for the **Provider Name** field.
