



# Release Notes for Cisco MPLS Tunnel Builder Version 1.0

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March 6, 2002



Note

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You can find the most current Cisco IOS documentation on Cisco.com. These electronic documents might contain updates and modifications made after the hardcopy documents were printed.

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These release notes contain platform and system requirements and instructions for installing and setting up Version 1.0 of the Cisco MPLS Tunnel Builder.

Cisco MPLS Tunnel Builder is a web-based graphical application for configuring and visualizing Multiprotocol Label Switching (MPLS) tunnels as well as viewing performance statistics using the Service Assurance Agent (SAA) on supported Cisco IOS platforms.

For an online copy of these release notes, go to the following URL:

[http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/tnblldr/tb1\\_0/tbreln10.htm](http://www.cisco.com/univercd/cc/td/doc/product/rtrmgmt/tnblldr/tb1_0/tbreln10.htm)

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# Introduction

Cisco MPLS Tunnel Builder displays a Traffic Engineering (TE) topology map on the right of the browser window and a series of tabs on the left side. A status message window is provided on the right side at the bottom that displays server and device information messages. The user may interact with the network map using the mouse as well as view information about the nodes, links, and tunnels on the network map using the tabs.

The left side of the browser window consists of the following tabs:

- **Setup**—Use this tab for specifying a “seed” router, the device from which you want to view information. You can also choose a mapping style from the Setup tab:
  - **Symmetric**—The distance between the nodes is minimized.
  - **Hierarchical**—The network hierarchy is emphasized.
  - **Circular**—Nodes are placed in clusters where possible.
  - **Orthogonal**—Style is similar in appearance to a schematic diagram.
- **Nodes**—Use this tab for setting selected node values and displaying information about the nodes on the network map.
- **Links**—Use this tab for setting selected link values and displaying information about the links on the network map.
- **Tunnels**—Use this tab for adding, modifying, or deleting MPLS tunnels on the network map. The Tunnel Builder application propagates the changes to the network in real time.
- **Delay/Jitter**—Use this tab for measuring performance characteristics between devices.
- **Views**—Use this tab for selecting an MPLS topology, Tunnels only, or CDP topology view and for monitoring link and tunnel traps. Links and tunnels can be highlighted on the network map based on the selected metric.

## System Requirements

### Hardware Supported

Cisco MPLS Tunnel Builder can be used on any hardware platform that supports MPLS Traffic Engineering. For Version 1.0, these platforms include the following:

- Cisco 7200 Series routers
- Cisco 7500 Series routers
- Cisco 12000 Series routers

### Disk Space Requirements

The installation of the Cisco MPLS Tunnel Builder Version 1.0 requires that you have 90 MB of free disk space.

## Operating Systems Supported

### Cisco MPLS Tunnel Builder Server

The Tunnel Builder server must be running on a web server that can handle Java and provide the Cisco MPLS Tunnel Builder Java applet to a web browser. For Tunnel Builder Version 1.0, the Tunnel Builder server can run on the following:

- Solaris, Version 2.8
- Microsoft Windows NT
- Microsoft Windows 2000

### Cisco MPLS Tunnel Builder Client

For Cisco MPLS Tunnel Builder Version 1.0, the Tunnel Builder client can run on the following:

- Solaris, Version 2.8
- Microsoft Windows NT
- Microsoft Windows 2000

## Web Browsers Supported

Cisco MPLS Tunnel Builder Version 1.0 requires one of the following web browsers and the Java Plug-in specified below:

- Internet Explorer, Version 5.0 or later
- Netscape Navigator, Version 4.5 or later

Windows 2000 and Windows NT—If you are using Netscape Version 4.7, you need to install the Java Plug-in Version 1.3 before running Tunnel Builder.

Solaris—If you run the Solaris Version 2.8 client, use the Netscape browser Version 4.79 with the Java Plug-in Version 1.3.1.01. In the .cshrc file, set the plugin path. Example:

```
setenv NPX_PLUGIN_PATH~java/j2re1_3_1_01/plugin/sparc/ns4
```

## Cisco IOS Releases Supported

The Tunnel Builder application supports devices running the following Cisco IOS releases:

- Cisco IOS Release 12.1(5)T or later
- Cisco IOS Release 12.0(11)ST or later
- Cisco IOS Release 12.0(9)S or later

# Installing and Starting Cisco MPLS Tunnel Builder

This section includes the following topics:

- [Installation for Solaris](#)
- [Installation on Microsoft Windows NT and Windows 2000](#)
- [Uninstalling Cisco MPLS Tunnel Builder for Microsoft Windows NT and Windows 2000](#)

## Installation for Solaris

To install and start the Tunnel Builder application on Solaris systems, perform the following steps:

- Step 1** Copy the `tb-1.0.x-kit-sol.tar` and `tb-1.0.x-setup-sol.sh` files from the CD to a temporary directory or a directory under your web server doc directory in which you plan to install the application, for example, `/scratch/suitespot/docs/TunnelBuilder`.



**Note** Copy the files from the CD to a temporary or web server directory before you execute the setup file (installation script). You cannot install Cisco MPLS Tunnel Builder from the CD. If you run the installation script from the CD, the Cisco MPLS Tunnel Builder Solaris kit tries to install or copy the files on the CD itself. If you run the installation script from the UNIX machine itself, then the installation script fails to find the tar file on the CD.

- Step 2** Make sure that you can execute the `tb-1.0.x-setup-sol.sh` script:

```
chmod 755 tb-1.0.x-setup-sol.sh
```

The `x` completes the version number. For example, the version number might be `1.0.1`.

- Step 3** Log in as root.

```
$ su root
password: <password>
```

- Step 4** Run the `tb-1.0.x-setup-sol.sh` file.

```
web-server-doc-dir% ./tb-1.0.x-setup-sol.sh
```

The setup file, `tb-1.0.x-setup-sol.sh`, runs a script that asks you where you want to locate the Cisco MPLS Tunnel Builder files. Enter the full path of your web server doc directory.

```
Where (in what directory) would you like the Tunnel Builder client and server to be installed?
```

```
/scratch/suitespot/docs/TunnelBuilder
```

After the Cisco MPLS Tunnel Builder files are copied and installed, you are asked to enter a license key and configure several options, as follows:

```
Please enter the license key
license-key
```

```
What port would you like to use for the Tunnel Builder client and server communication?
[7271]
```

```
Would you like to receive SNMP trap notification of links and tunnels changing status?
[no]
```

What port would you like to use for receiving UDP datagrams? [162]



**Note** If port 162 conflicts with other network management options, then enter another port number. Port 162 is the standard port for UDP communication.

What SNMP community string would you like to use? [public]

Would you like to run the Tunnel Builder server in debug mode? [no]

Would you like to enable logging of Tunnel Builder commands and logging of commands sent to the router? [no]

Would you like to disable Tunnel Builder's use of the Cisco Discovery Protocol (CDP)? [no]

**Step 5** When the installation script is complete, you are asked if you want to run the server automatically.

To start the server manually, you execute a **startTopoServer** command from your web server doc directory.

```
cd /scratch/suitespot/docs/TunnelBuilder/serverkit
web-server-doc-dir% ./startTopoServer
```

**Step 6** To start the Tunnel Builder application, use your web browser to find and select the ServerControl.html file, for example, <http://<server-host-name>/TunnelBuilder/clientkit/ServerControl.html>.

To access the Tunnel Builder application from your laptop, use your web browser to find and select the ServerControlLaptop.html file, for example, <http://<server-host-name>/TunnelBuilder/clientkit/ServerControlLaptop.html>.



**Note** If you have not previously downloaded and installed the Java Plug-in Version 1.3, you may be prompted to do so at this point.

The Tunnel Builder application is displayed in your browser window.

**Step 7** To access Cisco MPLS Tunnel Builder online help, click the **Help** button. This link is located in the browser window at the top right in the Tunnel Builder banner. See [Figure 1](#).

*Figure 1 Cisco MPLS Tunnel Builder Banner and Help Button*



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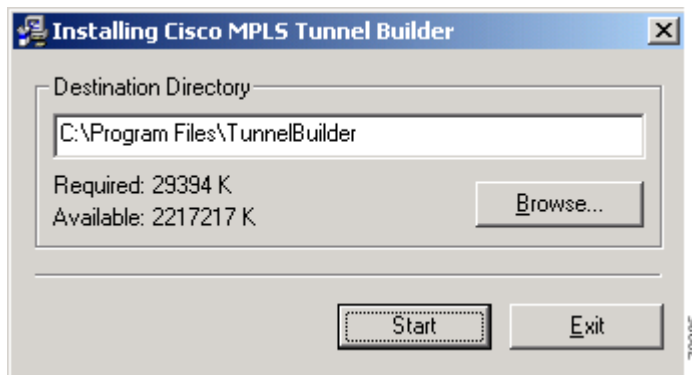
## Installation on Microsoft Windows NT and Windows 2000

To install and start the Tunnel Builder application on Microsoft Windows NT or Windows 2000 systems, perform the following steps:

- Step 1** Copy the `tb-1.0.x-setup-win32.exe` file to a directory on your Windows NT or Windows 2000 system.
- Step 2** Double-click the **tb-1.0.x-setup-win32.exe** file to install the Cisco MPLS Tunnel Builder application. The `x` completes the version number. For example, the version number might be 1.0.1.

The Installing Cisco MPLS Tunnel Builder dialog box appears (see [Figure 2](#)). You can choose to install the application in the default location `C:\Program Files\TunnelBuilder` or click **Browse** to set up an alternate destination directory for Tunnel Builder.

*Figure 2 Installing Cisco MPLS Tunnel Builder Dialog Box*



**Note** If you are not running the browser and the Tunnel Builder server on the same machine, then install Tunnel Builder in your web server's document directory.

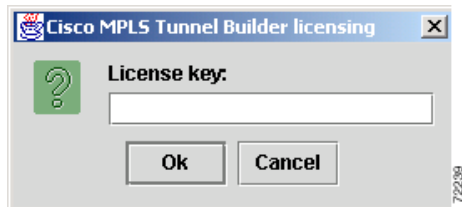
Click **Start** to continue the installation. After the Tunnel Builder files are copied to your directory, an Installing Cisco MPLS Tunnel Builder dialog box appears, similar to [Figure 3](#).

*Figure 3 Installing Cisco MPLS Tunnel Builder Dialog Box*



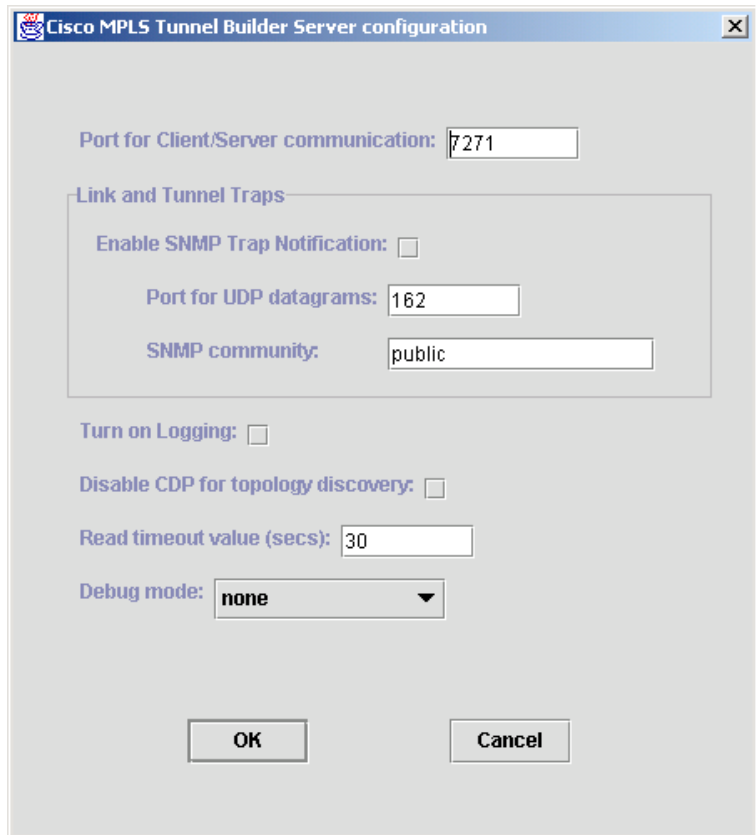
- Step 3** Check either, both, or neither of the following: **View Readme File** or **Run Installed Application**. If you check both and click **OK**, the following occurs:
- The ReadMe file (tb-1.0.x-readme.txt) is displayed in a Notepad window.
  - The server is started in an MS-DOS CMD.exe window.
  - The Cisco MPLS Tunnel Builder licensing dialog box appears (see [Figure 4](#)).

*Figure 4 Cisco MPLS Tunnel Builder Licensing Dialog Box*



- Step 4** Enter your License key in the space provided and click **OK**. The Cisco MPLS Tunnel Builder Server configuration dialog box appears (see [Figure 5](#)).

*Figure 5 Cisco MPLS Tunnel Builder Server Configuration Dialog Box*



- Step 5** In the Cisco MPLS Tunnel Builder Server configuration dialog box:
- Enter a port number in the **Port for Client/Server communication** field. The default is 7271.

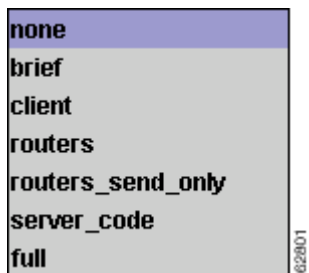
- In the Link and Tunnel Traps area:
  - To activate SNMP traps notification, check the **Enable SNMP Trap Notification** check box. The default is disabled.
  - Enter a port number in the **Port for UDP datagrams** field. The default value is 162.



**Note** If port 162 conflicts with other network management options, then enter another port number. Port 162 is the standard port for UDP communication.

- Enter a community name in the **SNMP community** field. The default is public.
- To generate a log file, check the **Turn on Logging** check box. The default is to not generate a log file.
- To remove the CDP topology option from the Tunnel Builder client, check the **Disable CDP for topology discovery** check box. If you are only interested in MPLS topology, then you could check this option. The default is CDP topology discovery enabled.
- Enter a number in the **Read timeout value (secs)** field. The default value is 30 seconds.
- To view the debug modes, click the drop-down arrow in the **Debug mode** field (see [Figure 5](#)). Click the debug mode option (see [Figure 6](#)) that you want to track. The default option is none.

*Figure 6 Debug Mode Options*



After making your choices, click **OK**. The installation creates a TBConfig.txt file that contains your choices. An HTML file that sets up communication between the Cisco MPLS Tunnel Builder server and client is also updated with the port numbers to use for communications.

**Step 6** If you did not start the Tunnel Builder server during the installation, choose **Start > Programs > TunnelBuilder > start Tunnel Builder Server** to start the Tunnel Builder server. [Figure 7](#) shows an example of the Tunnel Builder server execution commands.



Figure 7 Tunnel Builder Server Execution Commands

```

C:\WINNT\System32\cmd.exe
32\Wbem;C:\Oracle\Ora81\bin;C:\PROGRA~1\Oracle\jre\1.1.7\bin;C:\PROGRA~1\DOCUME~1\Shared;.\glt\bin

C:\InetPub\wwwroot\TunnelBuilder>cd serverkit

C:\InetPub\wwwroot\TunnelBuilder\serverkit>.\Jre\1.3.1\bin\java -cp .;.\glt\lib\
tsgltj10.jar;.\jre -jar toposerver.jar
operating system: Windows 2000
selectedvalue_0k
OK from key window.
Checking out feature TU50
license for 50 check passed
Checking out feature TU150
license check failed: No such feature exists(-5,116)

Checking out feature TU151
license check failed: No such feature exists(-5,116)

operating system: Windows 2000
getTUConfigParameters going away
Cisco MPLS Tunnel Builder server version: 1.0(1).042
starting Cisco MPLS Tunnel Builder server
listening for commands on port 7271
Graph Initialization complete, waiting for a command

```

The Tunnel Builder Server configuration dialog box (see Figure 5) appears if you did not already start the Tunnel Builder server during installation.

- Step 7 Choose **Start > Programs > TunnelBuilder > Tunnel Builder Window** to start the Tunnel Builder application in your browser window.
- Step 8 To access Tunnel Builder online help, click the **Help** button. This link is located in the browser window at the top right in the Tunnel Builder banner. Figure 8 shows the Tunnel Builder banner and the position of the Help button.

Figure 8 Cisco MPLS Tunnel Builder Banner and Help Button

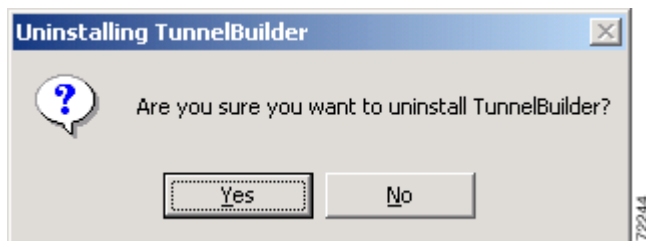


## Uninstalling Cisco MPLS Tunnel Builder for Microsoft Windows NT and Windows 2000

To uninstall Cisco MPLS Tunnel Builder, perform the following steps:

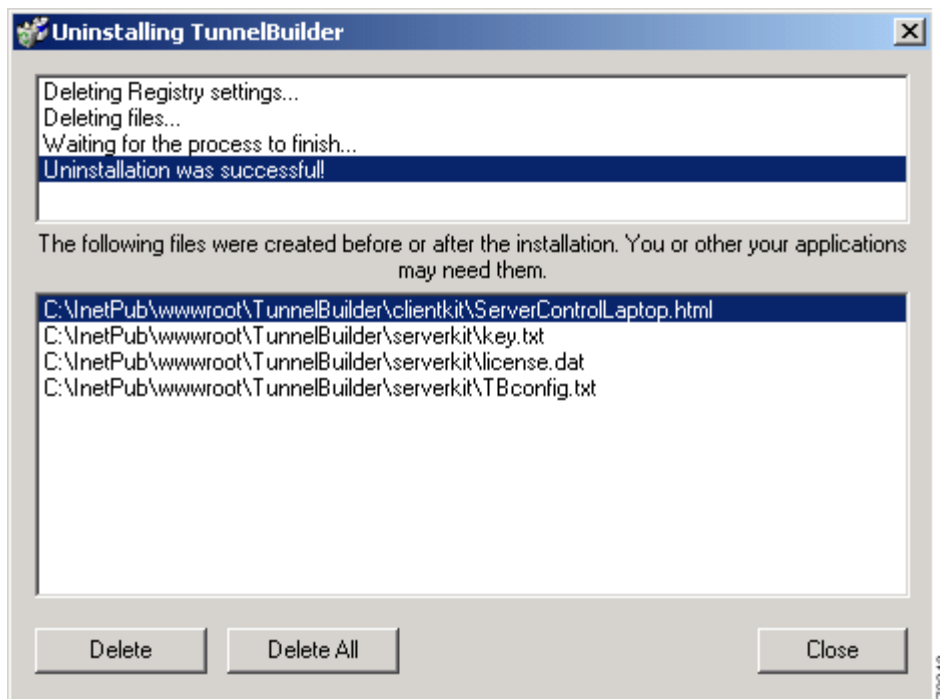
- Step 1** Choose **Start > Programs > TunnelBuilder > Uninstall**. You are asked to verify that you want to uninstall Cisco MPLS Tunnel Builder (see [Figure 9](#)).

*Figure 9 Verification Dialog Box*



- Step 2** Click **Yes**, if you want to uninstall Cisco MPLS Tunnel Builder. The Uninstalling TunnelBuilder window appears (see [Figure 10](#)).

*Figure 10 Uninstalling TunnelBuilder Window*



- Step 3** Select the HTML files and the TBConfig.txt files. Click **Delete**. If you have added seed routers and want to save them, do not select them, and *do not* click **Delete All**.

**Note**

If you are reinstalling the Cisco MPLS Tunnel Builder application, make sure that you remove the TBConfig.txt file. Otherwise, the reinstallation does not update the HTML file with the correct ports for server and client communication.

**Step 4** Click **Close** to exit from the Uninstalling Tunnel Builder window.

## New Features in Version 1.0

This section describes the features for Cisco MPLS Tunnel Builder Version 1.0. The Tunnel Builder application includes a network map and features for managing tunnels as well as for managing links and devices. Specific features are described in the following sections:

- [Network Map, page 11](#)
- [Device Management, page 12](#)
- [Link Management, page 13](#)
- [Tunnel Management, page 13](#)
- [Security, page 16](#)
- [Licensing, page 18](#)
- [Online Help System, page 18](#)

## Network Map

The network map includes topologies based on Multiprotocol Label Switching (MPLS) and the Cisco Discovery Protocol (CDP). The network map also contains tunnel information obtained directly from each device through MPLS or CDP. When a network map is generated, the Tunnel Builder application obtains all the MPLS information, CDP information, traffic engineering (TE) information, and device configuration by directly accessing the devices. Cached data for this information can also be accessed from the server.

## Seed Routers

The Tunnel Builder application references network maps based on a seed router. The seed router provides the MPLS-based topology information and is the device through which the search for CDP neighbors begins. The Tunnel Builder application maintains a list of known seed routers. You can add or delete seed routers from the Seed Routers List.

## MPLS-Based Topology

The Tunnel Builder application generates a list of network nodes and links based on the MPLS topology read from the seed router. Based on the generated list, the Tunnel Builder application accesses each device to read device configuration information. Using the gathered information, the Tunnel Builder application can manage the devices, links, and MPLS TE tunnels that make up the network map.

## CDP-Based Topology

The Tunnel Builder map contains network nodes and links found by CDP. The Tunnel Builder application accesses these devices to obtain and manage the device's configuration information. If the devices are not running CDP, the network map includes only those devices listed in the MPLS topology information.

## Mapping Choices

You can view these subsets of the network topology:

- Nodes and links that are part of the MPLS-based network topology
- Nodes and links that are part of the CDP-based network topology
- Tunnels existing in the network topology

## Maintaining Network Map Information

The network topology is read any time that a new seed router is specified and you request a map. You can also request an update to the map for a given seed router. You can update the map with the present seed router by clicking **Fetch from Network**. After specifying a new seed router you can update the map by clicking either Fetch button.

## Device Management

Most of Tunnel Builder features described in the following section relate to the configuration of a single device. However, the Tunnel Builder application provides as much information as it can about all devices in the network map. The following features allow you to manage devices.

## Viewing Device Configuration Information

The Tunnel Builder application gathers and displays the following configuration information about each device in the network map:

- Interfaces on the device (IP address, interface name, TE status, and global and subpool bandwidth settings)
- MPLS TE device ID

## MPLS Tunnels Headed by Device

The Tunnel Builder application provides you with a list of MPLS tunnels headed by a specific device.

## Committing Changes to Device Configurations

The Tunnel Builder application allows you to save changes to the configuration information of the device and write the current running configuration into nonvolatile memory. You accomplish this by clicking "Commit changes" in the **Setup** tab.

## Link Management

The following features of the Tunnel Builder application allow you to monitor links.

### Viewing Link Configuration Information

The Tunnel Builder application gathers and displays the following information about the interfaces for each link in the network map:

- Maximum bandwidth
- Maximum reservable global pool bandwidth
- Maximum reservable subpool bandwidth
- Bandwidth allocated and reservable per priority (0 to 7)
  - Total allocated bandwidth
  - Global pool reservable bandwidth
  - Subpool reservable bandwidth
- Attribute bit settings

### Link Up/Down Event Notification

The Tunnel Builder application provides timely notification to the user of interface up or interface down events that affect any of the links in a network map.

### Updating Link Bandwidth Information

The Tunnel Builder application supplies bandwidth information (allocated, global pool, and subpool numbers) on a per-priority basis for every link in the network. The application reads this information from the output of the **show mpls traffic topology** command. The bandwidth information is accurate as of the last Interior Gateway Protocol (IGP) update that occurred on the network.

The IGP update process is completely separate from the Tunnel Builder application and any Tunnel Builder map updates that occurs. The time between IGP updates is determined by a router configuration setting and by a router threshold that is triggered when a tunnel tries to come up, but does not have the bandwidth.

The Tunnel Builder application provides an update button that causes the Tunnel Builder server to go out to the seed router, get the MPLS topology, and update the bandwidth information for every link in the map. This button allows you to get bandwidth information that is accurate as of the last IGP update.

## Tunnel Management

The following features of the Tunnel Builder application allow you to manage tunnels.

### Viewing and Monitoring Tunnels

The Tunnel Builder application gathers and displays the following configuration information about the MPLS tunnels found in a network map:

- Tunnel name and number

- Tunnel status
  - Operating status (up or down)
  - Administrative status (up or down)
  - Path status (valid or not valid)
  - Signaling status (connected or not connected)
- Bandwidth specified for the tunnel
- Priority of tunnel
- Affinity bit settings
- Head and destination
- Explicit route (LSP) used by the tunnel
- Traffic sent and received statistics for the tunnel
- Autoroute setting for the tunnel
- Autobandwidth settings for the tunnel

## Tunnel Up/Down Event Notification

The Tunnel Builder application provides you with timely notification of a link up or link down event that affects any tunnels in a network map.

## Creating a Tunnel

You can create MPLS tunnels with a wide variety of configurations with the Tunnel Builder application. You must use the following configuration parameters:

- Source device (the head of the tunnel)
- Destination device (required if a dynamic path option is selected)
- At least one path option

Using the parameters described below, you can create one or more identically configured tunnels.



### Note

The maximum number of tunnels that you can create in a batch depends upon Cisco IOS support for the platform as a tunnel head or midpoint. For details, see [MPLS Traffic Engineering \(TE\)—Scalability Enhancements](#).

## Path Options

A tunnel may have more than one path option. Path options are numbered. The lowest numbered option is used first, if available. You can specify the following types of path options with the Tunnel Builder application:

- A new explicit path—You select the head device and a sequence of links that form the new explicit path for use by the tunnel.
- An existing explicit path—You select an existing explicit path on the head device.
- A dynamic path—You select the head device and the tail device.

## Optional MPLS Tunnel Parameters

The settings for the following MPLS tunnel parameters are optional. If you do not specify a value for these parameters, the default values are used.

- Bandwidth required for the MPLS tunnel in kbps. The default is 0.
- Affinity bits, attribute values required for links carrying this tunnel, specified as a value/mask pair. The default is 0x00000000/0x0000FFFF.
- Priority used when signaling an LSP for this tunnel, with allowed values 0 to 7; 0 is the highest priority; 7 is the lowest. The default is 7. Setup priority and hold priority are typically configured to be equal. Setup priority cannot be better (numerically smaller) than the hold priority.
- Tunnel name, or tunnel description. The default is *router\_t#*, where *router* is the device's host name and *#* is the tunnel number.
- Autoroute, specifies that the IGP should use the tunnel in its enhanced shortest path first (SPF) calculations. The default is to set no autoroute.
- Autoroute metric, specifies the MPLS traffic engineering tunnel metric (absolute or relative) value.
- Autobandwidth (can be configured for tunnels on devices that support the autobandwidth feature).

## Directing Traffic into an MPLS Tunnel

To direct traffic into an MPLS tunnel with the Tunnel Builder application, you create a tunnel with autoroute enabled. Traffic can also be directed into an MPLS tunnel by defining a static route on the head device. You can create and delete static routes from the Nodes tab.

## Modifying or Deleting a Tunnel

You can modify the following parameters for a specified tunnel using the Tunnel Builder application:

- Bandwidth
- Affinity bits
- Priority
- Autoroute
- Autoroute metric
- Autobandwidth (modifiable on devices that support this feature)

You can use the Tunnel Builder application to delete an existing tunnel based on the head device and tunnel number. You can select multiple tunnels for deletion in a single operation.



### Note

When a tunnel is deleted that uses an explicit path, the explicit path is not automatically removed. When a tunnel is deleted that uses a static route, the static route is not automatically removed.

## Creating and Deleting Explicit Paths

You can define an explicit path on a specified device using the Tunnel Builder application. You can use explicit paths in conjunction with defining the path options of an MPLS tunnel.

To create an explicit path, you must specify the following information:

- Name of the explicit path

- Sequence of links that make up the explicit path

The Tunnel Builder application provides information about the bandwidth available along with an explicit path. The bandwidth available on an explicit path is equal to the bandwidth available on the link within the explicit path that has the least available bandwidth.

You can delete an existing explicit path on a specified device based on the explicit path name.

## Security

The Cisco MPLS Tunnel Builder application provides means to ensure security when accessing routers. The application uses a combination of a user name, login password, and enable password to authenticate a user on a selected seed router (see [Figure 11](#)). Tunnel Builder uses the user name, password, and enable password combination that you entered as the default authentication information for all other routers in the network map. All routers are accessed using the same user name. If a router does not require a user name when you log in, then the user name is not sent to the router. However, the server uses the user name for client identification.

You are allowed to use different login and enable passwords on different routers through the use of a separate password file. This password file contains one line for each router using any passwords that are different from those in the default authentication information. You have the option of creating this password file when you access the Tunnel Builder application. [Figure 11](#) shows the Authentication dialog box for the seed router that contains a Create password file check box.

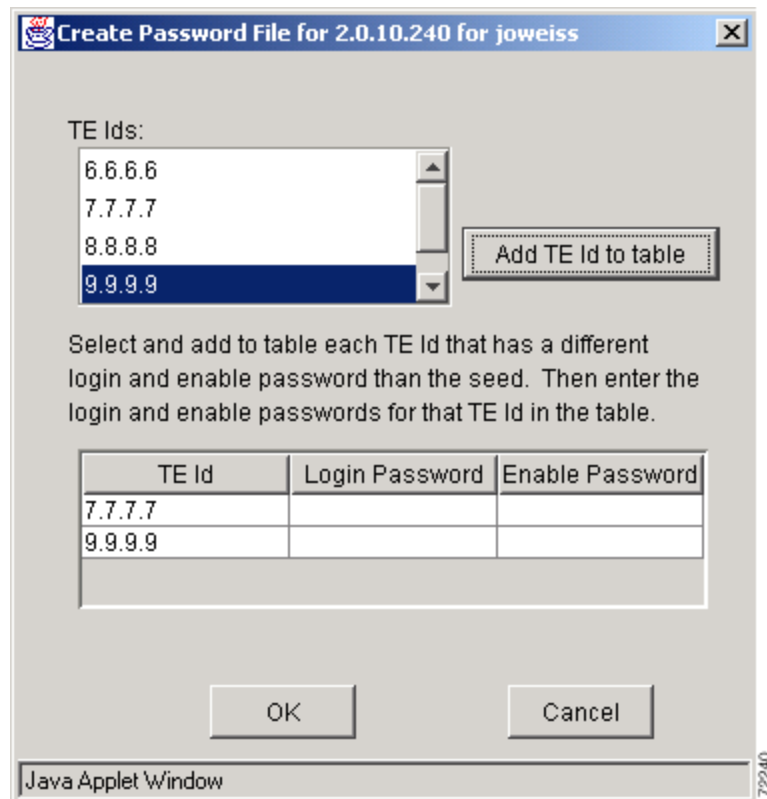
*Figure 11 Authentication Dialog Box*



To create a password file, check the **Create password file** check box. The Create Password File dialog box appears for the seed router for the username (see [Figure 12](#)).



Figure 12 Create Password File Dialog Box



The routers are defined in the password file using their TE Ids. You can select and add a TE Id and enter the its associated login password and enable password in the Create Password File dialog box. The format of the file is as follows:

```
#comment - the passwords for node 2.2.2.2
TEId:2.2.2.2:password:red:enablepw:blue
# the passwords for node 3.3.3.3
TEId:3.3.3.3:password:yellow:enablepw:green
# this router uses the same enable password as the default
TEId:4.4.4.4:password:brown
# if the router requires a null password
TEId:5.5.5.5:password::enablepw:gray
```

The password file uses the filename *username\_1\_2\_3\_4.txt*, where *username* is the user name and *1.2.3.4* is the IP address of the seed router.

The Tunnel Builder server performs this authentication process and returns a message to the Tunnel Builder client indicating if the authentication was successful or not. Only users that are successfully authenticated are allowed to fetch the MPLS and CDP topologies to construct a network map.

When you perform a command that changes the configuration of a router, for example, **create tunnel**, **modify tunnel**, **delete tunnel**, **modify link**, and **start rtr**, Tunnel Builder uses your authentication information and the additional passwords found in the password file to make the change. If another user performs a **fetch from server** on the same seed router, they are authenticated and receive the cached network map that was actually read from the network using the first user's authentication information and password file.

You cannot make changes to a router without having valid password information.

## Licensing

To install Cisco MPLS Tunnel Builder Version 1,0, you must enter an authorized license key. This license key is specified on your *Right to Use* document included in your product. This license key authorizes a maximum number of traffic engineering (TE)-enabled routers in the TE topology for any single seed router, dependent on your order.

On Windows systems, the first time the server is started after the installation completes, the application displays a Cisco MPLS Tunnel Builder licensing dialog box. After you enter your license key in this dialog box and click **OK**, the application creates a license.dat file. If a license.dat file exists in the server kit directory, you do not get the dialog box to enter the license key.

On Solaris systems, the application prompts you for a license key during setup.

Once you approach the limit of the license, you are notified by a message, like the following:

```
Number of TE routers (xxx) in the 1.2.3.4 network exceeds the number allowed by your
Tunnel Builder license (yyy). Please contact your administrator.
```

Where:

- xxx is the number of TE routers in your network
- 1.2.3.4 is the seed router from which you tried to fetch
- yyy is the upper bound of your license, either 50 or 150

You can choose to upgrade the maximum number of TE-enabled routers supported for any single seed router in Tunnel Builder. You will need a new *Right to Use* document and a new authorized license key(s) for each level through which you upgrade.

*Right to Use* documents and authorized license keys are available for the following levels:

- 1 to 50 MPLS TE-enabled routers
- 51 to 150 MPLS TE-enabled routers
- More than 150 MPLS TE-enabled routers

## Online Help System

The Tunnel Builder online help system uses your default web browser. Supported browsers are Netscape Navigator (Version 4.5 or later) and Internet Explorer (Version 5 or later).

## Limitations and Restrictions

### Netscape Version 4.7 and the Java Plug-in Version 1.3

You must install the Java Plug-in Version 1.3 *before* attempting to run the Cisco MPLS Tunnel Builder Version 1.0 client on a Microsoft Windows machine using the Netscape Communicator Version 4.7 browser. Alternatively, you can use the Netscape Version 4.5 browser or Internet Explorer Version 6.0 browser where you are prompted to download Java Plug-in Version 1.3, if it is not already installed.

### Displaying Larger Numbers of Nodes

Displaying a topology map with a large number of nodes makes the map less readable. You can use the “+” button to zoom in on specific areas of the map for a more readable view.

# Caveats

Caveats describe unexpected behavior in Cisco MPLS Tunnel Builder software releases. Severity 1 caveats are the most serious; severity 2 caveats are less serious. Severity 3 caveats are moderate caveats, and only selected severity 3 caveats are included in the caveats document.

This section contains open caveats for the current Cisco MPLS Tunnel Builder release.

## Open Caveats—Cisco MPLS Tunnel Builder Version 1.0

This section describes possibly unexpected behavior by Cisco MPLS Tunnel Builder Version 1.0. This section describes only severity 1, severity 2 and selected severity 3 caveats.

- **CSCdv44276—Netscape 4.7 cannot find Java Plugin 1.3**

Netscape Version 4.7 cannot find the Java Plug-in Version 1.3, which is required for running Cisco MPLS Tunnel Builder Version 1.0.

**Workaround:** You must install the Java Plug-in Version 1.3 *before* attempting to run the Cisco MPLS Tunnel Builder Version 1.0 client on a Microsoft Windows machine using the Netscape Communicator Version 4.7 browser. Alternatively, you can use the Netscape Version 4.5 browser or Internet Explorer Version 6.0 browser where you are prompted to download Java Plug-in Version 1.3 if it is not already installed.

- **CSCdw16989—snmp trap notification**

When you install Cisco MPLS Tunnel Builder on the server, you can choose an SNMP trap reporting option. The default port is port 162. In some cases, port 162 might interfere with other network management processes. Port 162 is also the standard port for UDP communications. You need to be aware of these issues and set up traps on another port during the installation if you foresee a conflict within your network.

**Workaround:** Set up SNMP trap reporting on a port other than 162.

- **CSCdw17186—Cancel fetch from Server fails**

Occasionally, when you cancel a **fetch from server**, the Setup tab fails to come back to allow a subsequent fetch.

**Workaround:** Reload or refresh the browser.

- **CSCdw18264—lost connection to server message**

If you attempt to create a static route on a router that has the same destination prefix, mask, and tunnel TE Id for the next hop as an existing static route on that router, the Cisco MPLS Tunnel Builder client could display an error message that indicates a lost connection to the server.

**Workaround:** Do not attempt to create a static route that already exists on the router.

- **CSCdw26429—some links don't get highlighted**

When you select a tunnel(s) in the Tunnel pane, some links are not highlighted in blue if you are displaying the topology map in either the Hierarchical or Orthogonal layout styles. Links are highlighted in blue if you are displaying the topology map in either the Symmetric or Circular layout styles.

**Workaround:** Use the Symmetric or Circular layout if you experience this problem.

- **CSCdw57028—Links Update button causes interface error**

If an improperly configured router exists in the network, using the Update button in the Links panel causes the Cisco MPLS Tunnel Builder server to produce the following error:

```
Error:Interface 0.0.0.0 not found in topology for seed 172.27.232.160
```

**Workaround:** Ensure that all nodes on your network map are configured properly for Traffic Engineering (TE). Examine your network map for nodes with a TE Id of 0.0.0.0 and reconfigure these nodes for TE.

## Obtaining Documentation

The following sections provide sources for obtaining documentation from Cisco Systems.

### World Wide Web

You can access the most current Cisco documentation on the World Wide Web at the following sites:

<http://www.cisco.com>

Translated documentation is available at the following URL:

[http://www.cisco.com/public/countries\\_languages.shtml](http://www.cisco.com/public/countries_languages.shtml)

### Documentation CD-ROM

Cisco documentation and additional literature are available in a Cisco Documentation CD-ROM package, which is shipped with your product. The Documentation CD-ROM is updated monthly and may be more current than printed documentation. The CD-ROM package is available as a single unit or through an annual subscription.

### Ordering Documentation

Cisco documentation is available in the following ways:

- Registered Cisco Direct Customers can order Cisco product documentation from the Networking Products MarketPlace:  
[http://www.cisco.com/cgi-bin/order/order\\_root.pl](http://www.cisco.com/cgi-bin/order/order_root.pl)
- Registered Cisco.com users can order the Documentation CD-ROM through the online Subscription Store:  
<http://www.cisco.com/go/subscription>
- Nonregistered Cisco.com users can order documentation through a local account representative by calling Cisco corporate headquarters (California, USA) at 408 526-7208 or, elsewhere in North America, by calling 800 553-NETS (6387).

## Documentation Feedback

If you are reading Cisco product documentation on Cisco.com, you can submit technical comments electronically. Click **Leave Feedback** at the bottom of the Cisco Documentation home page. After you complete the form, print it out and fax it to Cisco at 408 527-0730.

You can e-mail your comments to [bug-doc@cisco.com](mailto:bug-doc@cisco.com).

To submit your comments by mail, use the response card behind the front cover of your document, or write to the following address:

Cisco Systems  
Attn: Document Resource Connection  
170 West Tasman Drive  
San Jose, CA 95134-9883

We appreciate your comments.

## Obtaining Technical Assistance

Cisco provides Cisco.com as a starting point for all technical assistance. Customers and partners can obtain documentation, troubleshooting tips, and sample configurations from online tools by using the Cisco Technical Assistance Center (TAC) Web Site. Cisco.com registered users have complete access to the technical support resources on the Cisco TAC Web Site.

## Cisco.com

Cisco.com is the foundation of a suite of interactive, networked services that provides immediate, open access to Cisco information, networking solutions, services, programs, and resources at any time, from anywhere in the world.

Cisco.com is a highly integrated Internet application and a powerful, easy-to-use tool that provides a broad range of features and services to help you to

- Streamline business processes and improve productivity
- Resolve technical issues with online support
- Download and test software packages
- Order Cisco learning materials and merchandise
- Register for online skill assessment, training, and certification programs

You can self-register on Cisco.com to obtain customized information and service. To access Cisco.com, go to the following URL:

<http://www.cisco.com>

## Technical Assistance Center

The Cisco TAC is available to all customers who need technical assistance with a Cisco product, technology, or solution. Two types of support are available through the Cisco TAC: the Cisco TAC Web Site and the Cisco TAC Escalation Center.

Inquiries to Cisco TAC are categorized according to the urgency of the issue:

- Priority level 4 (P4)—You need information or assistance concerning Cisco product capabilities, product installation, or basic product configuration.
- Priority level 3 (P3)—Your network performance is degraded. Network functionality is noticeably impaired, but most business operations continue.
- Priority level 2 (P2)—Your production network is severely degraded, affecting significant aspects of business operations. No workaround is available.
- Priority level 1 (P1)—Your production network is down, and a critical impact to business operations will occur if service is not restored quickly. No workaround is available.

Which Cisco TAC resource you choose is based on the priority of the problem and the conditions of service contracts, when applicable.

## Cisco TAC Web Site

The Cisco TAC Web Site allows you to resolve P3 and P4 issues yourself, saving both cost and time. The site provides around-the-clock access to online tools, knowledge bases, and software. To access the Cisco TAC Web Site, go to the following URL:

<http://www.cisco.com/tac>

All customers, partners, and resellers who have a valid Cisco services contract have complete access to the technical support resources on the Cisco TAC Web Site. The Cisco TAC Web Site requires a Cisco.com login ID and password. If you have a valid service contract but do not have a login ID or password, go to the following URL to register:

<http://www.cisco.com/register/>

If you cannot resolve your technical issues by using the Cisco TAC Web Site, and you are a Cisco.com registered user, you can open a case online by using the TAC Case Open tool at the following URL:

<http://www.cisco.com/tac/caseopen>

If you have Internet access, it is recommended that you open P3 and P4 cases through the Cisco TAC Web Site.

## Cisco TAC Escalation Center

The Cisco TAC Escalation Center addresses issues that are classified as priority level 1 or priority level 2; these classifications are assigned when severe network degradation significantly impacts business operations. When you contact the TAC Escalation Center with a P1 or P2 problem, a Cisco TAC engineer will automatically open a case.

To obtain a directory of toll-free Cisco TAC telephone numbers for your country, go to the following URL:

<http://www.cisco.com/warp/public/687/Directory/DirTAC.shtml>

Before calling, please check with your network operations center to determine the level of Cisco support services to which your company is entitled; for example, SMARTnet, SMARTnet Onsite, or Network Supported Accounts (NSA). In addition, please have available your service agreement number and your product serial number.

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