

Cisco **MPLS Tunnel Builder Pro**, Version 2.0

A new paradigm for providing Bandwidth Protection—Cisco MPLS Bandwidth Protection

A Quick Review of MPLS

Cisco Multiprotocol Label Switching (MPLS) is the ideal solution to meet the challenges posed by rapidly expanding new world networks. It is the key technology for delivery of Layer 2 and Layer 3 services. MPLS uses labels as designators to provide network-based VPNs and traffic engineering. Adding Cisco MPLS Traffic Engineering (TE), network designers can also significantly enhance services, assure bandwidth, augment Quality of Service (QoS), and deliver greater network reliability. With MPLS technology, networks can handle more traffic, users, media-rich data, and bandwidth-intensive applications.

Cisco MPLS Tunnel Builder Pro Solution

Cisco MPLS Tunnel Builder Pro—the web-based graphical application for configuring and visualizing MPLS tunnels in an MPLS TE-enabled network.

Tunnel Builder Pro is an enhancement to Tunnel Builder, Version 1.0.

Before Tunnel Builder, the management of traffic-engineered tunnels was a time-consuming process using a command line interface (CLI). Show commands were the only way of knowing the number of label switched paths (LSPs) that existed on any given router. Network information had to be manually recorded, and MPLS TE had

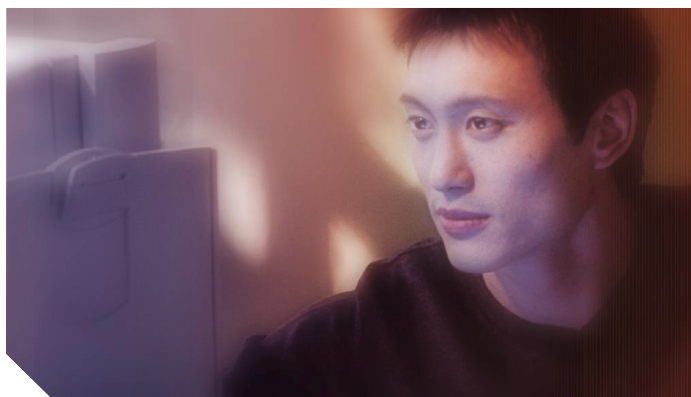
to be configured from the command line with knowledge of the specific destination addresses and explicit paths.

Cisco MPLS Tunnel Builder changed all of these requirements. Now network designers and administrators can view the entire network topology and configure MPLS TE by using a straightforward point-and-click interface.

Tunnel Builder Pro adds the ability to compute and configure backup tunnels with MPLS TE Fast Reroute in Cisco IOS® Software. By using Tunnel Builder Pro, backup tunnels can be placed such that the network meets bandwidth assurances during link and node failures.

Features of Cisco Tunnel Builder Pro

- Recommends backup tunnels that will protect the network. **New!**
- Determines what parts of the network are not currently protected by backup tunnels, and creates detailed reports of why these elements are not protected. **New!**
- Supports specification of Shared Risk Link Groups (SRLGs)—a set of links sharing the same risk that need to be eliminated for the computation of backup tunnels. **New!**





“With MPLS technology, networks can handle more traffic, users, media-rich data, and bandwidth-intensive applications.”

- Network map
- Tunnel-related link and node management
- Tunnel management
- Performance statistics
- Online help

Backup Tunnels Protect Your Network

Tunnel Builder Pro provides bandwidth protection for both links and nodes through the use of Fast Reroute backup tunnels. A backup tunnel is an MPLS TE tunnel used to protect the traffic in any other (primary) tunnel during a link or node failure.

MPLS Bandwidth Protection Increases Revenue

- Increases the value of Service Level Agreements (SLAs) and allows higher tariffs for offered services.
- Provides “carrier-class” services by enabling “protected or unprotected” circuits.

MPLS Bandwidth Protection Reduces Costs

- Reduces the cost of network protection by using Fast Reroute instead of physical layer protection. Also, backup tunnel bandwidth is available to unprotected traffic during normal (non-failure) operations.
- Reduces the need for over-provisioning. Can easily protect delay- and bandwidth-sensitive traffic (ie: voice and video).
- Shares bandwidth efficiently between independent failures.
- Reduces penalty payments for SLA violations.
- Enables infrastructure convergence, which enables the IP infrastructure to carry high-value, delay-sensitive traffic.
- Reduces management costs, because it automates complex tasks, with flexibility, to meet real-world needs.

Find Out What Parts of Your Network are Protected

Determining what parts of the network are protected is quite simple. To check links or nodes, just select them and click “Check Protection.” Colors make it simple to interpret the results. Green highlights denote backup tunnels that protect an element, whereas pink highlights indicate elements that cannot be fully protected by backup tunnels.

SRLGs Allow Next-Hop (NHOP) Backup Tunnel to Bypass Multiple Links

Shared Risk Link Groups (SRLG) are sets of links that are likely to go down together—maybe because they have the same underlying fiber conduit. When an SRLG is specified for links, then Tunnel Builder Pro finds one or more NHOP backup tunnels that avoid all links in the SRLG.

If a link is not in an SRLG, Tunnel Builder Pro simply finds a backup tunnel that avoids the link being protected.

Network Map Provides Valuable Information

A network map provides MPLS topology, TE, and device configuration information. Both primary tunnels and Fast Reroute backup tunnels can be displayed.

Tunnel Builder provides on-demand updates, and displays fetch information from the network and the latest information.

A status window displays server and device informational messages, including the status of Backup Route Generator (BRG) requests—requests to generate backup tunnels and to check whether an element is Fast Reroute protected by existing backup tunnels.

Obtaining Information About Links and Nodes is a Click Away

At the setup pane, a click on one of the Fetch buttons will display the latest information from the network or the server.

Link Management Allows You to Manage the TE Resources on Your Links

Information about the interfaces for each link in the network map can be viewed, including:

- Bandwidth allocated and reservable per priority
- Maximum bandwidth
- Maximum reservable global pool bandwidth
- Maximum reservable sub-pool bandwidth
- Attribute bit settings
- TE metric

The link up/down status is shown.

Node Management

Find out information about nodes on the network, including:

- Interior Gateway Protocol (IGP) ID
- MPLS TE ID
- Cisco IOS Software release
- Interfaces on the nodes
- Static routes that map traffic onto MPLS TE tunnel interfaces

And autobandwidth can be configured.

Flexible MPLS TE Tunnel Management

Tunnel Builder Pro allows network operators to create, view, modify, or delete tunnels easily.

Choosing an existing explicit path, creating a new explicit path, or using a dynamic path can manipulate tunnels.

To modify a tunnel's attributes (ie: amount of bandwidth, affinity bits, autobandwidth), simply enter the desired values or click in the appropriate boxes.

View Performance Statistics

Using Cisco IOS Service Assurance Agent (SAA), performance statistics can be viewed on supported Cisco IOS platforms. Tunnel Builder Pro can invoke SAA, collect performance statistics, and display them in a window. What an easy way to measure performance characteristics between devices!

Online Help is Available

If you have questions while using Tunnel Builder, take advantage of Tunnel Builder's online help system, which is available by clicking on the Help button.

Tunnel Builder Pro Advantages

- Protects bandwidth in the event of a single element failure, with bandwidth sharing between independent failures
- Protects more bandwidth than traditional CSPF-based approaches, through the use of a sophisticated backup tunnel placement algorithm
- Provides choice of primary tunnel traffic to protect the global pool or the sub-pool
- Reduces the need for cumbersome, error-prone CLI configurations
- Provides the ability to quickly check whether an existing set of backup tunnels provides guaranteed Fast Reroute protection for elements in the network
- Assures top performance, as the feature was designed and engineered by Cisco, the networking leader
- Integrates the latest Cisco IOS MPLS TE features with Tunnel Builder Pro
- Communicates directly with the routers, so there is no need to manually import or export configuration files

Easy to Install and Use

Follow simple installation instructions, and you're ready to go!

How does it work? The information needed is just a click away. After installing Tunnel Builder Pro and fetching the network data, the network topology map will appear on the right side of the browser window, while tabs for various functions will be available on the left side.

Tunnel Builder Pro uses a client-server architecture, which offers the same operating model as Web browsing. Tunnel Builder Pro runs as a Java applet in a Netscape Navigator or Microsoft Internet Explorer Web browser. The Tunnel Builder Pro Java applet communicates with Tunnel Builder Pro server software that queries your network topology and returns the gathered information to the Tunnel Builder Pro client. The Tunnel Builder Pro server uses Cisco IOS Software to configure routers.

System Requirements

Network Hardware Supported

Cisco routers that support MPLS TE

Operating Systems Supported

- Solaris, Version 2.8 for the Tunnel Builder Pro server
- The client is a Web browser running on Microsoft Windows NT or Microsoft Windows 2000

Disk Space Requirements

At least 100 megabytes of free disk space is recommended. Disk space requirements for the operation of Tunnel Builder Pro depend on the network size.

Hardware Requirements

The following are required on the system where the BRG server is to be installed:

- A 1-GHz or faster processor
- At least 1 GB of physical RAM

Web Browsers Supported

Tunnel Builder requires one of the following Web browsers and the Java Plug-in specified below:

- Internet Explorer, Version 5.5 or later
- Netscape Navigator, Version 4.7 or later
- Windows 2000 and Windows NT clients—If you are using Netscape Version 4.7, you need to install the Java Plug-in Version 1.3.1 before running Tunnel Builder Pro.

For More Information, go to
<http://www.cisco.com/go/mpls>

Ordering Information

Part Number	Cisco MPLS Tunnel Builder 2.0—Here's What You Get...
TB-2.0-APP-25	Cisco MPLS Tunnel Builder 2.0—25 routers
TB-2.0-APP-50	Cisco MPLS Tunnel Builder 2.0—50 routers
TB-2.0-APP-75	Cisco MPLS Tunnel Builder 2.0—75 routers
TB-2.0-APP-100	Cisco MPLS Tunnel Builder 2.0—100 routers
TB-2.0-APP-150	Cisco MPLS Tunnel Builder 2.0—150 routers
TB-2.0-APP-UL	Cisco MPLS Tunnel Builder 2.0—unlimited number of routers
Part Number	Upgrades to Cisco MPLS Tunnel Builder 2.0
TB-2.0-APP-50U	Cisco MPLS Tunnel Builder 2.0—25 to 50 routers upgrade
TB-2.0-APP-75U	Cisco MPLS Tunnel Builder 2.0—50 to 75 routers upgrade
TB-2.0-APP-100U	Cisco MPLS Tunnel Builder 2.0—75 to 100 routers upgrade
TB-2.0-APP-150U	Cisco MPLS Tunnel Builder 2.0—100 to 150 routers upgrade
TB-2.0-APP-ULU	Cisco MPLS Tunnel Builder 2.0—150 to unlimited number of routers upgrade

Part Number	Cisco MPLS Tunnel Builder 2.0—Here's What You Get...
TBPRO2.0-25	Cisco MPLS Tunnel Builder Pro 2.0—25 routers
TBPRO2.0-50	Cisco MPLS Tunnel Builder 2.0 Pro—50 routers
TBPRO2.0-75	Cisco MPLS Tunnel Builder 2.0 Pro—75 routers
TBPRO2.0-100	Cisco MPLS Tunnel Builder 2.0 Pro—100 routers
TBPRO2.0-150	Cisco MPLS Tunnel Builder 2.0 Pro—150 routers
TBPRO2.0-UL	Cisco MPLS Tunnel Builder 2.0 Pro—unlimited number of routers
Part Number	Upgrades to Cisco MPLS Tunnel Builder 2.0
TBPRO2.0-50U	Cisco MPLS Tunnel Builder Pro 2.0—25 to 50 routers upgrade
TBPRO2.0-75U	Cisco MPLS Tunnel Builder Pro 2.0—50 to 75 routers upgrade
TBPRO2.0-100U	Cisco MPLS Tunnel Builder Pro 2.0—75 to 100 routers upgrade
TBPRO2.0-150U	Cisco MPLS Tunnel Builder Pro 2.0—100 to 150 routers upgrade
TBPRO2.0-ULU	Cisco MPLS Tunnel Builder Pro 2.0—150 to unlimited number of routers upgrade



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