



CHAPTER 13

Multi Protocol Label Switching Traffic Engineering (MPLS-TE)

This chapter describes the level of support that Cisco ANA provides for MPLS-TE, as follows:

- [Inventory and Information Model Objects \(IMOs\), page 13-1](#)
- [Network Topology, page 13-3](#)
- [Service Alarms, page 13-3](#)

Inventory and Information Model Objects (IMOs)

This section includes the following tables:

- [MPLS TE Tunnel Interface \(IMplsTETunnel\)](#)
- [MPLS TE Properties \(IMplsTEProperties\)](#)
- [MPLS TE Allocation Entry \(IMplsTEPropertiesAllocationEntry\)](#)
- [MPLS TE Tunnel Segment \(IMplsTESegment\)](#)

MPLS TE Tunnel Interface

The following Network/Data Link layer [MPLS TE Tunnel Interface](#) object, is bound by its Containing Termination Points attribute to a Data Link Layer Interface object, and is primarily being accessed by Network layer [IP Interface](#) bound by its Contained Connection Termination Points attribute. It is also being accessed by [Label Switching Entity](#).

Table 13-1 *MPLS TE Tunnel Interface (IMplsTETunnel)*

Attribute Name	Attribute Description
Destination Address	Destination IP address
Outgoing Interface and Label	Outgoing interface and label
Path Identification	Label Switching Path (LSP) identification
Requested Bandwidth	Requested bandwidth
Measured Average, Burst and Peak Bandwidth	Measured average, burst and peak bandwidth

Table 13-1 MPLS TE Tunnel Interface (IMplsTETunnel) (continued)

Attribute Name	Attribute Description
Setup and Hold Priority	Setup and hold priority of the tunnel
Affinity Bits and Mask	Required traffic engineering affinity bits and mask attributes of the tunnel's links
Automatic Route Announcement Status	Automatic route announcement status (<i>Enable, Disable</i>)
Optimization Lock Down Status	Label switching path optimization lock down status (<i>Enable, Disable</i>)
Path Option	Label switching path option (<i>Explicit, Dynamic</i>)
Name	Interface name
Description	Interface description
Administrative Status	Administrative status (<i>Unknown, Up, Down</i>)
Operational Status	Operational status (<i>Unknown, Up, Down</i>)
IANA Type	IANA type of the sub/layer
Containing Termination Points	Underlying termination points (MPLS Interface)
Contained Connection Termination Points	Bound Connection Termination Points (IP Interface or MPLS Interface)

MPLS TE Properties

The following [MPLS TE Properties](#) with its [MPLS TE Allocation Entry](#) objects describes the traffic engineering properties of a [MPLS Interface](#), which is bound to by its traffic engineering properties attribute.

Table 13-2 MPLS TE Properties (IMplsTEProperties)

Attribute Name	Attribute Description
Administrative Weight	Administrative weight
Attributes Identifier	Attributes list identifier
Signalling Protocol	Signalling protocol (<i>None, RSVP, CR-LDP, Other</i>)
Available, Physical and Reserveable Bandwidth	Available, physical and reserveable bandwidth
Reserved Bandwidth	Arrays of MPLS TE Allocation Entry

MPLS TE Allocation Entry

Table 13-3 MPLS TE Allocation Entry (IMplsTEPropertiesAllocationEntry)

Attribute Name	Attribute Description
Priority Level	Allocation priority level (0-7)
Allocated and Cumulative Bandwidth	Allocated and cumulative bandwidth at and up this priority level

MPLS TE Tunnel Segment

The following [MPLS TE Tunnel Segment](#) object describes, as the name implies, the properties of a single segment of an MPLS TE Tunnel, which is being used by the Graphical User Interface [GUI] of the management application for visualizing the MPLS TE Tunnels network and has no effect on the Virtual Network Element [VNE] logic implementation. The segments are aggregated in MPLS TE Tunnel Segments table of the Label Switching Entity.

Table 13-4 MPLS TE Tunnel Segment (IMplsTESegment)

Attribute Name	Attribute Description
Source and Destination Addresses	Source and destination IP addresses of the tunnel
Incoming Interface and Label	Incoming interface and label (if not head segment)
Outgoing Interface and Label	Outgoing interface and label (if not tail segment)
Segment Type	Segment type (<i>Head, Intermediate, Tail</i>)
Measured Average, Burst and Peak Bandwidth	Measured average, burst and peak bandwidth
Path Identification	Label Switching Path (LSP) identification
Name	Segment name

Network Topology

The discovery of Multi Protocol Label Switching Traffic Engineering [MPLS-TE] Network layer topology is unsupported.

Service Alarms

The following alarms are supported for this technology:

- MPLS TE Tunnel Down/MPLS TE Tunnel Up
- MPLS TE Tunnel Flapping/MPLS TE Tunnel Up or Down

These alarms are disabled by default.

**Note**

For a detailed description of these alarms and for information about correlation see the *Cisco Active Network Abstraction MPLS User Guide*, 3.6.
