



## **OSS Integration Guide for the Cisco Mobile Wireless Transport Manager**

6.1

November 2008

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**GLOSSARY**

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## Preface

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Welcome to the *OSS Integration Guide for the Cisco Mobile Wireless Transport Manager*. This guide describes how to use the MWTM 6.1 Northbound Application Programming Interface (NBAPI) to develop custom applications.

The Graphical User Interface (GUI) is covered in the *User Guide for the Cisco Mobile Wireless Transport Manager 6.1*.

For the latest MWTM information and software updates, go to <http://www.cisco.com/go/mwtm>.



### Note

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This guide is to be used in conjunction with the documentation listed in the “[Related Documentation](#)” section on page xvii.

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This preface contains the following sections:

- [Document Revision History, page xv](#)
- [Objectives, page xvi](#)
- [Audience, page xvi](#)
- [Organization, page xvi](#)
- [Conventions, page xvii](#)
- [Related Documentation, page xvii](#)
- [Obtaining Documentation, Obtaining Support, and Security Guidelines, page xviii](#)

## Document Revision History

The subsequent Document Revision History table records technical changes to this document. The table shows the document revision number for the change, the date of the change, and a brief summary of the change.



### Note

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Not all Cisco documents use a Document Revision History table.

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Revision	Date	Change Summary
OL-9121-01	March 2007	Initial release.
OL-13316-00	December 2008	MWTM 6.1 release.

## Objectives

This guide explains how to integrate the Cisco Mobile Wireless Transport Manager (MWTM) into an Operations Support System (OSS) environment.

## Audience

This guide is designed for network administrators who are designing networks that include the MWTM or preparing a site for MWTM integration. It assumes a broad understanding of network design, operation, and terminology in general, networking principles, and network configuration. You should also be familiar with Cisco IOS and NX-OS software and its commands.

## Organization

The major sections of this software configuration guide are listed in the following table:

Chapter	Title	Description
Chapter 1	<a href="#">Overview</a>	Describes the MWTM 6.1 NBAPI.
Chapter 2	<a href="#">MWTM 6.1 Inventory API</a>	Describes the MWTM 6.1 Inventory API.
Chapter 3	<a href="#">MWTM 6.1 Event API</a>	Describes the MWTM 6.1 Event API.
Chapter 4	<a href="#">MWTM 6.1 Provision API</a>	Describes the MWTM 6.1 Provision API.
Chapter 5	<a href="#">Third-Party Applications and MWTM Integration</a>	Describes the interface by which third-party applications can integrate with MWTM 6.1
Chapter 6	<a href="#">Customizing MWTM 6.1 GUI Troubleshooting Commands</a>	Describes how to create troubleshooting commands for the MWTM 6.1 GUI.
Chapter 7	<a href="#">MWTM 6.1 Northbound Traps</a>	Describes the MWTM 6.1 Northbound traps.
Chapter 8	<a href="#">MWTM 6.1 NBAPI CLI Tools</a>	Describes the MWTM 6.1 NBAPI CLI tools.
Appendix A	<a href="#">MWTM 6.1 NBAPI WSDL and XSD Definitions</a>	Describes the MWTM 6.1 NBAPI WSDL and XSD definitions.
Appendix B	<a href="#">MWTM 6.1 NBAPI Error Codes</a>	Describes the MWTM 6.1 NBAPI error codes.
Appendix C	<a href="#">CISCO-SYSLOG-MIB</a>	Describes the CISCO-SYSLOG-MIB.
Appendix D	<a href="#">CISCO-EPM-NOTIFICATION-MIB</a>	Describes the CISCO-EPM-NOTIFICATION-MIB.
Appendix E	<a href="#">MWTM 6.1 Monitor Attributes</a>	Describes the MWTM 6.1 Inventory attributes.
Appendix F	<a href="#">MWTM 6.1 Provision Attributes</a>	Explains the MWTM 6.1 Provision attributes.
Appendix G	<a href="#">Northbound Trap Examples</a>	Provides examples of MWTM 6.1 Northbound MIB traps.
Appendix H	<a href="#">SOAP Message Examples</a>	Provides examples of SOAP messages.
Appendix I	<a href="#">MWTM 6.1 NBAPI Integration for Java Developers</a>	Provides information and examples for Java developers.
Appendix J	<a href="#">MWTM 6.1 MIB Capabilities</a>	Lists the MIB capabilities defined for MWTM 6.1.

# Conventions

This guide uses the following conventions to convey instructions and information.

Convention	Description
<b>boldface font</b>	Commands and keywords.
<i>italic font</i>	Variables for which you supply values.
[ ]	Keywords or arguments that appear within square brackets are optional.
{x   y   z}	A choice of required keywords appears in braces separated by vertical bars. You must select one.
screen font	Examples of information displayed on the screen.
<b>boldface screen font</b>	Examples of information you must enter.
< >	Nonprinting characters, for example passwords, appear in angle brackets.
[ ]	Default responses to system prompts appear in square brackets.



## Note

Means *reader take note*. Notes contain helpful suggestions or references to material not covered in the manual.



## Timesaver

Means *the described action saves time*. You can save time by performing the action described in the paragraph.



## Tip

Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.



## Caution

Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

# Related Documentation

Additional MWTM documentation can be found on Cisco.com:

[http://www.cisco.com/en/US/products/ps6472/tsd\\_products\\_support\\_series\\_home.html](http://www.cisco.com/en/US/products/ps6472/tsd_products_support_series_home.html)

The MWTM includes a browser-based online help system that is searchable and supports bookmarking of favorite content.

# Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New* in Cisco Product Documentation, which also lists all new and revised Cisco technical documentation, at:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>



# CHAPTER 1

## Overview

---

Cisco Mobile Wireless Transport Manager (MWTM) 6.1 provides monitoring and management capabilities that enable network administrators to discover, manage, and troubleshoot networks that include Cisco IP Transfer Point (ITP) or Radio Access Network Optimization (RAN) networks.

You can access the MWTM 6.1 via two interfaces:

- The graphical user interface (GUI)—Connects you to an easy-to-navigate tree display of all network objects and extensive web-based online help.
- The MWTM 6.1 Operations Support System (OSS) integration Application Programming Interface (API)—Intended for the OSS integrator and developer. The MWTM 6.1 OSS integration API provides the programming interface to the MWTM 6.1 for inventory, event, and provisioning management.

The MWTM supports both Hypertext Transfer Protocol (HTTP) and Hypertext Transfer Protocol over Secure Socket Layer (HTTPS) communications for the GUI interface and the OSS integration interface. To set up secure access to these interfaces, see “Implementing SSL Support in the MWTM” in Chapter 2 of the *User Guide for the Cisco Mobile Wireless Transport Manager 6.1*. Non-secure access is described in this chapter.

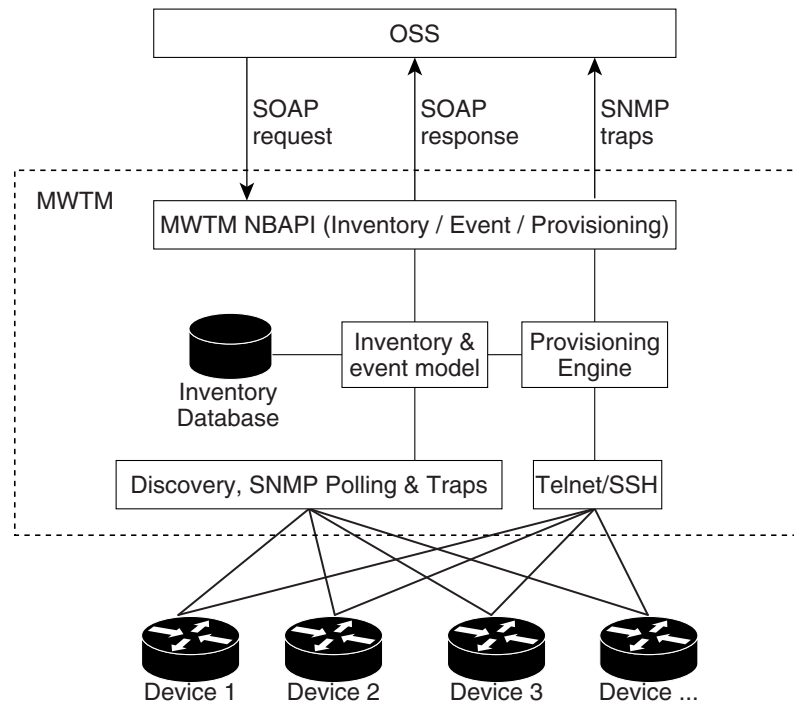
This chapter includes the following sections:

- [MWTM 6.1 NBAPI Overview, page 1-2](#)
- [SOAP-based API for Northbound OSS Integration, page 1-2](#)
- [Three Categories of Functions: Inventory, Event, Provisioning, page 1-3](#)

# MWTM 6.1 NBAPI Overview

MWTM 6.1 provides a Northbound API (NBAPI) interface for OSS integration. A block diagram illustrating the MWTM and Northbound API is shown in Figure 1-1.

Figure 1-1 MWTM 6.1 and NBAPI Block Diagram



## SOAP-based API for Northbound OSS Integration

The OSS can send Simple Object Access Protocol (SOAP)<sup>1</sup> requests to the MWTM 6.1 Inventory/Event/Provision API. MWTM 6.1 provides Remote Procedure Call (RPC) style API that accepts SOAP messages from the OSS and responds with SOAP responses. The MWTM 6.1 Event API might also respond to OSS requests by sending Simple Network Management Protocol (SNMP) traps to the Northbound OSS in addition to the SOAP response.

The MWTM 6.1 Northbound API is defined in the Web Service Definition Language (WSDL). WSDL<sup>2</sup> is a W3C recommendation. It defines the communication protocol and message exchanges between two remote applications.

MWTM 6.1 implemented SOAP 1.1 Hypertext Transfer Protocol (HTTP) binding by using the Java Web API for XML Web Services (JAX-WS) 2.0.

1. A communication protocol between remote applications (see <http://www.w3.org/TR/soap/>).

2. An interface definition language for web services (see <http://www.w3.org/TR/wSDL/>).

# Three Categories of Functions: Inventory, Event, Provisioning

The three categories of functions that MWTM 6.1 provide are:

- [Inventory, page 1-3](#)
- [Event, page 1-3](#)
- [Provisioning, page 1-4](#)

## Inventory

The Inventory API provides methods for the Northbound OSS to retrieve MWTM 6.1 inventory objects from MWTM 6.1 database.

The following operations are provided by the MWTM 6.1 Inventory API:

- Retrieve all the inventory objects from MWTM 6.1.
- Retrieve a specific inventory object from MWTM 6.1.
- Walk the MWTM 6.1 inventory tree.
- Attach a text note to an inventory object.

The Inventory API allows the OSS to synchronize with the MWTM 6.1 inventory database, or to retrieve any inventory object attributes, including both configuration attributes and status monitoring attributes.

## Event

The Event API provides methods for the Northbound OSS to retrieve events/alarms from the MWTM 6.1 database and to receive real-time notifications if the MWTM 6.1 receives or detects a network event/alarm.

The following operations are provided by the MWTM 6.1 Event API:

- Retrieve all the events from MWTM 6.1.
- Retrieve a filtered list of events from MWTM 6.1. Filter can be based on date/time, event ID range, severity, category, or message text.
- Clear an event alarm.
- Change severity of an event.
- Acknowledge an event.
- Attach a text note to an event.

The MWTM 6.1 event subsystem is shipped with a set of predefined event configurations. MWTM 6.1 also allows a flexible customization capability for the event subsystem. The administrator can:

- Customize MWTM 6.1 to send SNMP trap notifications to the OSS at a specified location (host/port) for v1 or v2c traps.
- Customize MWTM 6.1 event severities.
- Customize MWTM 6.1 event categories.
- Customize MWTM 6.1 event message text.
- Customize whether or not to include a specific type of MWTM 6.1 event for Northbound SNMP trap notification.

## Provisioning

The Provision API allows the OSS to provision the IP Transfer Point (ITP) Linkset and Link. It also allows the OSS to provision the Application Server (AS) and Application Server Process (ASP) for the Message Transfer Part, Level 3 (MTP3) User Adaptation (M3UA) and Signaling Connection Control Part (SCCP) User Adaptation (SUA) protocols.

The following operations are provided by the MWTM 6.1 Provision API:

- Provision Linkset/Link:
  - Add/delete Linkset/Link on device.
  - Add/delete/modify features on Linkset/Link.
- Provision Application Server/Application Server Process (AS/ASP):
  - Add/delete AS/ASP on device.
  - Add/delete/modify features on AS/ASP.
- Provision Router Interfaces:
  - Add/delete router interface on device.
  - Add/delete/modify features on router interfaces.



## CHAPTER 2

# MWTM 6.1 Inventory API

---

MWTM 6.1 collects device configuration and status information via discovery, status polling, and SNMP trap processing. The MWTM 6.1 data model processes the device information and stores the information in the inventory database.

MWTM 6.1 provides Remote Procedure Call (RPC) style Inventory API to the Northbound OSS. The OSS can send a SOAP request to the MWTM 6.1 Inventory API, and the MWTM 6.1 responds with SOAP responses.

This chapter includes the following sections:

- [Network Elements and FQDNs, page 2-1](#)
- [MWTM 6.1 Inventory API Operations, page 2-12](#)

## Network Elements and FQDNs

An inventory object is also referred to as a Network Element (NE). MWTM 6.1 inventory objects are organized in a tree structure. This tree structure is similar to what is visible in the MWTM 6.1 GUI. Each inventory object is identified by its location in the tree.

The following sections further describe MWTM network elements:

- [Understanding the MWTM Inventory Tree, page 2-1](#)
- [Building Fully Qualified Domain Names, page 2-4](#)
- [Understanding Network Element Attributes, page 2-6](#)
- [Understanding Network Element Information Types, page 2-8](#)

## Understanding the MWTM Inventory Tree

The MWTM 6.1 Inventory tree is similar to the navigation tree in the MWTM 6.1 GUI (see the *User Guide for the Cisco Mobile Wireless Transport Manager 6.1* for more information about MWTM 6.1 navigation tree). Here are some differences between the MWTM 6.1 inventory tree and the MWTM 6.1 navigation tree.

- A network element appears at different paths in the MWTM 6.1 GUI tree. For example, the RAN shorthaul serial interface appears in the GUI tree at Node > Ran Backhaul > Serial Interface / GSM Shorthaul. It also appears in the GUI tree at Node > Physical Folder > T1/E1 interface > Serial Interface.

- A network element can only appear at one unique path in MWTM 6.1 Inventory tree. It does not appear in multiple paths.
- The MWTM 6.1 Inventory API accepts both paths from the inventory tree and the GUI tree for network element querying operations. MWTM 6.1 responds with a normalized FQDN (inventory tree).

The following sections contain these inventory tree examples:

- [ITP Inventory Tree, page 2-2](#)
- [RAN Inventory Tree, page 2-3](#)
- [ONS Inventory Tree, page 2-3](#)
- [BWG Tree Inventory, page 2-4](#)
- [CSG2 Tree Inventory, page 2-4](#)
- [GGSN Tree Inventory, page 2-4](#)
- [HA Tree Inventory, page 2-4](#)


**Note**

Object types with an asterisk (\*) indicate the object type is an abbreviation for a long name. When referencing an object in MWTM 6.1, the client code can use either a short or long name. This short name to long name mapping can be configured in:

```
/${MWTM_INSTALL_BASEDIR}/properties/NEType.properties.
```

SP is short name for “SignalingPoint”

AS is short name for “ApplicationServer”

ASP is short name for “ApplicationServerProcess”

ASPA is short name for “ApplicationServerProcessAssociation”

SGMP is short name for “SignalingGatewayMatedPair”

RBH is short name for “RanBackhaul”

## ITP Inventory Tree

The following is an example Inventory tree structure for an ITP node (does not include configured network elements):

```
Node (subtype=ITP)
|
+--- SP*
|   |
|   +--- Linkset
|   |   |
|   |   +--- Link
|   |   |
|   +--- AS*
|       |
|       +--- ASPA*
|
+--- SGMP*
|
+--- Interface
|   |
|   +--- Interface
|
+--- Interface
```

```

|
+-- Folder
|
+-- Folder

```

## RAN Inventory Tree

The following is an example Inventory tree structure for a Radio Access Network (RAN) node:

```

Node (subtype=RAN)
|
+-- RBH*
|
+-- Interface
|   |
|   +-- Interface (subtype=GSM)
|
+-- Interface (subtype=UMTS)
|   |
|   +-- Interface (subtype=UMTS)
|
+-- Folder
|
+-- Folder

```

## ONS Inventory Tree

The following is an example of a tree structure for an Optical Networking System (ONS) node:

```

Node (subtype=ONS)
|
+-- Node (subtype=RAN_SVC)
|   |
|   +-- RBH*
|   |
|   +-- Interface
|       |
|       +-- Interface (subtype=GSM)
|
|   +-- Interface (subtype=UMTS)
|       |
|       +-- Interface (subtype=UMTS)
|
|   +-- Folder
|
|   +-- Folder
|
+-- Card
|   |
|   +-- Interface
|   |
|   +-- Interface
|
+-- Card
|   |
|   +-- Interface
|
+-- Folder
|
+-- Folder

```

## BWG Tree Inventory

The following is an example inventory tree structure for an Broadband Wireless Gateway (BWG) node:

```
Node (subtype=BWG)
```

## CSG2 Tree Inventory

The following is an example inventory tree structure for a Content Services Gateway 2 (CSG2) node:

```
Node (subtype=CSG2)
```

## GGSN Tree Inventory

The following is an example inventory tree structure for a Gateway GPRS Support Node (GGSN):

```
Node (subtype=GGSN)
```

## HA Tree Inventory

The following is an example inventory tree structure for a Home Agent (HA) node:

```
Node (subtype=HA)
```

## Building Fully Qualified Domain Names

A Fully Qualified Domain Name (FQDN) identifies a network element in the MWTM 6.1 inventory. It is the full tree path to an network element from the root. An FQDN is composed of one or more relative component names, separated by a comma (,) character.

The following are examples of FQDN:

- Node=sgm-75-80a
- Node=sgm-75-80a,SP=itunet0
- Node=sgm-75-80a,SP=itunet0,Linkset=7580a\_to\_7692a0,Link=0
- Node=ems1900kk
- Node=ems1900kk,Interface=E1 0/0,Interface=Serial 0/0:0
- Node=ems15454ea,Node=emsskyla2,Interface=GigaEthernet 0/0

Each of the component names is composed of an object type and an object identifier. The object identifier is also a Relative Distinguished Name (RDN). An RDN uniquely identifies a child inventory object under a given network element.

The following are example RDNs from previous FQDN examples:

- Node=sgm-75-80a
- SP=itunet0
- Linkset=7580a\_to\_7692a0
- Link=0
- Node=ems1900kk
- Interface=E1 0/0

- Interface=Serial 0/0:0
- Node=ems15454ea
- Node=emsskyla2
- Interface=GigaEthernet 0/0

Table 2-1 on page 2-5 lists all the object types and object identifiers in MWTM 6.1. In this table:

- An RDN uniquely identifies a child inventory object under a given network element.
- The object subtype is not part of the FQDN format. This attribute is used to identify subtypes for nodes and interfaces.

**Table 2-1** Object Type and Object Identifier

Object Type	Object Identifier (RDN)	Possible Object Subtypes	Notes
Node	Node Name or Node IP Address	BWG, CSG2, GGSN, ITP, ONS, RAN, RANSVC (RAN Service Module), and HA	A node network element supports multiple ways of lookup. It can be accessed either by name or by IP address. For example, because the sgm-75-80a node has two IP addresses, 172.18.16.18 and 172.18.16.242, the following FQDN representations can refer to the same node object: <ul style="list-style-type: none"> <li>• Node=sgm-75-80a</li> <li>• Node=172.18.16.18</li> <li>• Node=172.18.16.242</li> </ul>
SP (SignalingPoint)	Network Name, Instance Number, or SP Name		The object identifier for the signaling point is the network name. If a signaling point did not define a network name, the object identifier will be an empty string. In this scenario, the FQDN for the signaling point is: "Node=xxxxx,SP=".
Linkset	Linkset Name		
Link	Link SLC Number		
AS (ApplicationServer)	AS Name		
ASP (ApplicationServerProcess)	ASP Name		An application server process (ASP) might have multiple names. An object identifier with any of these names represents the same ASP.
ASPA (ApplicationServerProcess Association)	ASP Name		
SGMP (SignalingGatewayMated Pair)	SGMP Name		

Table 2-1 Object Type and Object Identifier (continued)

Object Type	Object Identifier (RDN)	Possible Object Subtypes	Notes
Interface	Interface Name	GSM (Global System for Mobile Communication) or UMTS (Universal Mobile Telecommunications System)	
RBH (RAN Backhaul)	Ran Backhaul Name		
Card	Card Slot Number		
Folder	Folder Name		

## Understanding Network Element Attributes

The MWTM 6.1 Inventory API represents a network element in XML (Extensible Markup Language) format. Each network element is represented by its parent FQDN, object type, and a list of attributes.

An attribute can be either:

- A simple name/value pair, represented by an “<Attribute>” tag.
- A group of attributes, represented by an “<AttributeGroup>” tag.

For a complete definition of the inventory XML syntax, see [Appendix A, “MWTM 6.1 NAPI WSDL and XSD Definitions.”](#)

The following is an example XML representation of an ITP node:

```
<NetworkElement type="Node" subtype="ITP" ParentFQDN="ParentFQDN=" ">
  <Attribute name="RDN">sgm-75-92b.cisco.com</Attribute>
  <Attribute name="State">Warning</Attribute>
  <Attribute name="StateReason">Interface Down</Attribute>
  <Attribute name="StateTimestamp">2006-08-28T23:56:01.360-04:00</Attribute>
  <Attribute name="IgnoreState">>false</Attribute>
  <Attribute name="DefaultIcon">Cisco7507</Attribute>
  <Attribute name="CustomIcon"></Attribute>
  <Attribute name="CustomName"></Attribute>
  <Attribute name="SysUpTime">P3DT6H40M47.550S</Attribute>
  <Attribute name="RebootReason">reload</Attribute>
  <AttributeGroup name="IPAddresses">
    <Attribute name="Addresses">172.18.17.35</Attribute>
    <Attribute name="Addresses">172.18.17.163</Attribute>
    <Attribute name="PollingTimestamps">2006-08-28T23:58:03.410-04:00</Attribute>
    <Attribute name="PollingTimestamps"></Attribute>
    <Attribute name="SNMPFlags">1</Attribute>
    <Attribute name="SNMPFlags">2</Attribute>
    <Attribute name="Statuses">Active</Attribute>
    <Attribute name="Statuses">Active</Attribute>
    <Attribute name="PrimaryAddress">172.18.17.35</Attribute>
    <Attribute name="LastPolledAddress">172.18.17.35</Attribute>
  </AttributeGroup>
  <Attribute name="EnableProcessTraps">>true</Attribute>
  <Attribute name="DiscoveredTimestamp">2006-08-28T05:52:48.819-04:00</Attribute>
  <Attribute name="DeviceType">Cisco7507z</Attribute>
</NetworkElement>
```

```

    <Attribute name="SysDescr">Cisco IOS Software, RSP Software (RSP-ITPK91V-M),
    Experimental Version 12.2(2006
    0825:064354) [stklein-topsail_s_nightly 104]
    Copyright (c) 1986-2006 by Cisco Systems, Inc.
    Compiled Fri 25-Aug-06 06:26 by stklein</Attribute>
    <Attribute name="SysName">sgm-75-92b.cisco.com</Attribute>
    <Attribute name="LastPollTimestamp">2006-08-28T23:58:03.410-04:00</Attribute>
    <Attribute name="LastPollTimePeriod">PT17.096S</Attribute>
    <Attribute name="AveragePollTimePeriod">PT16.420S</Attribute>
    <Attribute name="TelnetAddress"></Attribute>
    <Attribute name="MIBLevel">12.2(25)SW4</Attribute>
    <Attribute name="SerialNumber"></Attribute>
    <Attribute name="EnableTrapPolling">>false</Attribute>
    <Attribute name="EnableReportPolling">>false</Attribute>
    <Attribute name="CLLICode">ccli_9572b</Attribute>
    <Attribute name="NSOConfig">None</Attribute>
    <Attribute name="RFState">Standby Hot</Attribute>
    <Attribute name="Mtp3Offload">Main</Attribute>
  </NetworkElement>

```

The following is an example XML representation of an ITP link:

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:NetworkElement xmlns:ns2="http://cisco.com/mwmtm" type="Link"
parentFQDN="Node=sgm-26-96a.cisco.com,SP=ansi-config,Linkset=2696a_to_2696b">
  <Attribute name="RDN">0</Attribute>
  <Attribute name="State">Active</Attribute>
  <Attribute name="StateReason">None</Attribute>
  <Attribute name="StateTimestamp">2006-11-27T11:38:00.602-05:00</Attribute>
  <Attribute name="IgnoreState">>false</Attribute>
  <Attribute name="QOS">0</Attribute>
  <Attribute name="ConfigRemotePort">0</Attribute>
  <Attribute name="RemotePort">0</Attribute>
  <Attribute name="ConfigLocalPort">0</Attribute>
  <Attribute name="LocalPort">0</Attribute>
  <Attribute name="EffectiveLocalAddress"></Attribute>
  <Attribute name="EffectiveLocalInterface"></Attribute>
  <Attribute name="CongestionState">none</Attribute>
  <Attribute name="EffectiveRemoteAddress"></Attribute>
  <Attribute name="PrimaryRemoteAddress"></Attribute>
  <Attribute name="SCTPState">None</Attribute>
  <Attribute name="SLC">0</Attribute>
  <Attribute name="InterfaceName">Serial0/0:0</Attribute>
  <Attribute name="LinkType">Serial</Attribute>
  <Attribute name="ReceiveUtilizationState">underThreshold</Attribute>
  <Attribute name="SendUtilizationState">underThreshold</Attribute>
  <Feature name="Basic">
    <AttributeGroup name="Interface">
      <Attribute name="InterfaceName">Serial0/0:0</Attribute>
    </AttributeGroup>
    <Attribute name="LinkType">MTP2</Attribute>
  </Feature>
  <Feature name="MTP2Timer">
    <Attribute name="MtT1Value">12500</Attribute>
    <Attribute name="MtT2Value">6000</Attribute>
    <Attribute name="MtT3Value">5000</Attribute>
    <Attribute name="MtT4nValue">2007</Attribute>
    <Attribute name="MtT4eValue">550</Attribute>
    <Attribute name="MtT5Value">90</Attribute>
    <Attribute name="MtT7Value">900</Attribute>
  </Feature>
  <Feature name="MTP2">
    <Attribute name="PCR">>true</Attribute>
    <Attribute name="PCRN1">34</Attribute>

```

```

        <Attribute name="TxDepthValue">50</Attribute>
    </Feature>
    <Feature name="Description">
        <Attribute name="Description">Link Description</Attribute>
        <Attribute name="DisplayName">Link Name</Attribute>
    </Feature>
    <Feature name="CTParams">
        <Attribute name="CapacitySend">570000</Attribute>
        <Attribute name="ThresholdSend">7</Attribute>
        <Attribute name="ThresholdRcvd">7</Attribute>
    </Feature>
    <Feature name="LinkTimer">
        <Attribute name="LkT01Value">900</Attribute>
        <Attribute name="LkT02Value">900</Attribute>
        <Attribute name="LkT03Value">900</Attribute>
        <Attribute name="LkT04Value">900</Attribute>
        <Attribute name="LkT05Value">900</Attribute>
        <Attribute name="LkT12Value">900</Attribute>
        <Attribute name="LkT13Value">900</Attribute>
        <Attribute name="LkT14Value">2500</Attribute>
        <Attribute name="LkT17Value">800</Attribute>
        <Attribute name="LkT19Value">480000</Attribute>
        <Attribute name="LkT20Value">91111</Attribute>
        <Attribute name="LkT21Value">90000</Attribute>
        <Attribute name="LkT31Value">11111</Attribute>
        <Attribute name="LkT32Value">11111</Attribute>
        <Attribute name="LkSLTT01Value">4000</Attribute>
        <Attribute name="LkSLTT02Value">90000</Attribute>
        <Attribute name="LkRetryValue">90000</Attribute>
    </Feature>
</ns2:NetworkElement>

```

## Understanding Network Element Information Types

For all the network element attributes, the MWTM 6.1 Inventory API distinguishes two different information types:

- Configuration information
- Monitor information



**Note** There are certain network elements that do not have any monitor attributes. (MWTM 6.1 does not monitor the status of these network elements). These network elements are referred to as configuration network elements.

The following is an example of a tree that represents configured network element:

```

Node (subtype=ITP)
|
+-- SP
|   |
|   +-- Linkset*
|   |   |
|   |   +-- Link*
|   |
|   +-- AS*
|   |
|   +-- ASPA

```

```

+-- SGMP
|
+-- Interface T1/E1*
|   |
|   +-- Interface Serial*
|
+-- Interface FE*
|
+-- Interface ATM*
|
+-- Folder
|
+-- Folder
|
+-- ASP**
|
+-- LocalPeer**
|
+-- M3UA**
|
+-- SUA**

```

**Note**

- A network element with no markings indicates that it is a monitor network element (no configuration attributes).
- A network element with an asterisk (\*) indicates that it supports MWTM 6.1 provisioning. These network elements have both monitor and configuration attributes.
- A network element with two asterisks (\*\*) indicates that it supports MWTM 6.1 provisioning, and it is a configuration network element (no monitoring attributes).

The following sections describe these two different information types:

- [Configuration Information, page 2-9](#)
- [Monitor Information, page 2-10](#)

## Configuration Information

Configuration information refers to those network element attributes that are usually configured on the device. This type of information is relatively static. The information usually changes only if you provision the device.

The following are example attributes that are considered configuration information for an ITP node:

```

<NetworkElement type="Node" subtype="ITP" ParentFQDN="ParentFQDN=" ">
  <Attribute name="RDN">sgm-75-92b.cisco.com</Attribute>
</NetworkElement>

```

MWTM 6.1 does not have node level provision capability. It only provisions Linksets, Links, Application Servers (AS), Application Server Processes (ASP) and interfaces. As such, an ITP node does not contain any configuration information other than the RDN.

The following is an example XML representation of an ITP link:

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:NetworkElement xmlns:ns2="http://cisco.com/mwtm" type="Link"
parentFQDN="Node=sgm-26-96a.cisco.com,SP=ansi-config,Linkset=2696a_to_2696b">
  <Attribute name="RDN">0</Attribute>
  <Feature name="Basic">

```

```

    <AttributeGroup name="Interface">
      <Attribute name="InterfaceName">Serial0/0:0</Attribute>
    </AttributeGroup>
    <Attribute name="LinkType">MTP2</Attribute>
  </Feature>
  <Feature name="MTP2Timer">
    <Attribute name="MtT1Value">12500</Attribute>
    <Attribute name="MtT2Value">6000</Attribute>
    <Attribute name="MtT3Value">5000</Attribute>
    <Attribute name="MtT4nValue">2007</Attribute>
    <Attribute name="MtT4eValue">550</Attribute>
    <Attribute name="MtT5Value">90</Attribute>
    <Attribute name="MtT7Value">900</Attribute>
  </Feature>
  <Feature name="MTP2">
    <Attribute name="PCR">>true</Attribute>
    <Attribute name="PCRN1">34</Attribute>
    <Attribute name="TxDepthValue">50</Attribute>
  </Feature>
  <Feature name="Description">
    <Attribute name="Description">Link Description</Attribute>
    <Attribute name="DisplayName">Link Name</Attribute>
  </Feature>
  <Feature name="CTParams">
    <Attribute name="CapacitySend">570000</Attribute>
    <Attribute name="ThresholdSend">7</Attribute>
    <Attribute name="ThresholdRcvd">7</Attribute>
  </Feature>
  <Feature name="LinkTimer">
    <Attribute name="LkT01Value">900</Attribute>
    <Attribute name="LkT02Value">900</Attribute>
    <Attribute name="LkT03Value">900</Attribute>
    <Attribute name="LkT04Value">900</Attribute>
    <Attribute name="LkT05Value">900</Attribute>
    <Attribute name="LkT12Value">900</Attribute>
    <Attribute name="LkT13Value">900</Attribute>
    <Attribute name="LkT14Value">2500</Attribute>
    <Attribute name="LkT17Value">800</Attribute>
    <Attribute name="LkT19Value">480000</Attribute>
    <Attribute name="LkT20Value">91111</Attribute>
    <Attribute name="LkT21Value">90000</Attribute>
    <Attribute name="LkT31Value">11111</Attribute>
    <Attribute name="LkT32Value">11111</Attribute>
    <Attribute name="LkSLTT01Value">4000</Attribute>
    <Attribute name="LkSLTT02Value">90000</Attribute>
    <Attribute name="LkRetryValue">90000</Attribute>
  </Feature>
</ns2:NetworkElement>

```

## Monitor Information

Monitor information refers to those network element attributes that are not configured on the device, but their values could change depending on the network conditions. This type of information is relatively dynamic.

The following are example attributes that are considered monitor information for an ITP node:

```

<NetworkElement type="Node" subtype="ITP" ParentFQDN="ParentFQDN="">
  <Attribute name="RDN">sgm-75-92b.cisco.com</Attribute>
  <Attribute name="State">Warning</Attribute>
  <Attribute name="StateReason">Interface Down</Attribute>
  <Attribute name="StateTimestamp">2006-08-28T23:56:01.360-04:00</Attribute>

```

```

<Attribute name="IgnoreState">>false</Attribute>
<Attribute name="DefaultIcon">Cisco7507</Attribute>
<Attribute name="CustomIcon"></Attribute>
<Attribute name="CustomName"></Attribute>
<Attribute name="SysUpTime">P3DT6H40M47.550S</Attribute>
<Attribute name="RebootReason">reload</Attribute>
<AttributeGroup name="IPAddresses">
  <Attribute name="Addresses">172.18.17.35</Attribute>
  <Attribute name="Addresses">172.18.17.163</Attribute>
  <Attribute name="PollingTimestamps">2006-08-28T23:58:03.410-04:00</Attribute>
  <Attribute name="PollingTimestamps"></Attribute>
  <Attribute name="SNMPFlags">1</Attribute>
  <Attribute name="SNMPFlags">2</Attribute>
  <Attribute name="Statuses">Active</Attribute>
  <Attribute name="Statuses">Active</Attribute>
  <Attribute name="PrimaryAddress">172.18.17.35</Attribute>
  <Attribute name="LastPolledAddress">172.18.17.35</Attribute>
</AttributeGroup>
<Attribute name="EnableProcessTraps">>true</Attribute>
<Attribute name="DiscoveredTimestamp">2006-08-28T05:52:48.819-04:00</Attribute>
<Attribute name="DeviceType">Cisco7507z</Attribute>
<Attribute name="SysDescr">Cisco IOS Software, RSP Software (RSP-ITPK91V-M),
Experimental Version 12.2(2006
0825:064354) [stklein-topsail_s_nightly 104]
Copyright (c) 1986-2006 by Cisco Systems, Inc.
Compiled Fri 25-Aug-06 06:26 by stklein</Attribute>
<Attribute name="SysName">sgm-75-92b.cisco.com</Attribute>
<Attribute name="LastPollTimestamp">2006-08-28T23:58:03.410-04:00</Attribute>
<Attribute name="LastPollTimePeriod">PT17.096S</Attribute>
<Attribute name="AveragePollTimePeriod">PT16.420S</Attribute>
<Attribute name="TelnetAddress"></Attribute>
<Attribute name="MIBLevel">12.2(25)SW4</Attribute>
<Attribute name="SerialNumber"></Attribute>
<Attribute name="EnableTrapPolling">>false</Attribute>
<Attribute name="EnableReportPolling">>false</Attribute>
<Attribute name="CLLICode">ccli_9572b</Attribute>
<Attribute name="NSOConfig">None</Attribute>
<Attribute name="RFState">Standby Hot</Attribute>
<Attribute name="Mtp30ffload">Main</Attribute>
</NetworkElement>

```

The following are example attributes that are considered monitor information for an ITP link:

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<ns2:NetworkElement xmlns:ns2="http://cisco.com/mwtm" type="Link"
parentFQDN="Node=sgm-26-96a.cisco.com,SP=ansi-config,Linkset=2696a_to_2696b">
  <Attribute name="RDN">0</Attribute>
  <Attribute name="State">Active</Attribute>
  <Attribute name="StateReason">None</Attribute>
  <Attribute name="StateTimestamp">2006-11-27T11:38:00.602-05:00</Attribute>
  <Attribute name="IgnoreState">>false</Attribute>
  <Attribute name="QOS">0</Attribute>
  <Attribute name="ConfigRemotePort">0</Attribute>
  <Attribute name="RemotePort">0</Attribute>
  <Attribute name="ConfigLocalPort">0</Attribute>
  <Attribute name="LocalPort">0</Attribute>
  <Attribute name="EffectiveLocalAddress"></Attribute>
  <Attribute name="EffectiveLocalInterface"></Attribute>
  <Attribute name="CongestionState">none</Attribute>
  <Attribute name="EffectiveRemoteAddress"></Attribute>
  <Attribute name="PrimaryRemoteAddress"></Attribute>
  <Attribute name="SCTPState">None</Attribute>
  <Attribute name="SLC">0</Attribute>
  <Attribute name="InterfaceName">Serial0/0:0</Attribute>

```

```

    <Attribute name="LinkType">Serial</Attribute>
    <Attribute name="ReceiveUtilizationState">underThreshold</Attribute>
    <Attribute name="SendUtilizationState">underThreshold</Attribute>
  </ns2:NetworkElement>

```

For a complete list of MWTM 6.1 network element attributes, see [Appendix E, “MWTM 6.1 Monitor Attributes.”](#)

## MWTM 6.1 Inventory API Operations

This section lists the MWTM 6.1 Inventory API Operations.



### Note

- All the operations are listed as pseudocode with comments. Syntax for these operations is defined in Web Service Definition Language (WSDL). This syntax is described in [Appendix A, “MWTM 6.1 NBAPI WSDL and XSD Definitions.”](#)
- All MWTM 6.1 Inventory API operations use the SOAP fault for error handling. The error codes are defined in [Appendix B, “MWTM 6.1 NBAPI Error Codes.”](#)
- MWTM 6.1 Inventory API only retrieves information from the MWTM 6.1 internal data model. It does not modify or change inventory objects. The MWTM 6.1 Provision API provides methods to provision the device and change inventory objects (see [Chapter 4, “MWTM 6.1 Provision API”](#)).

## Get All Network Elements from MWTM

```
NetworkElementList getAllNEs (InventoryContext)
```

This method retrieves all the inventory objects from MWTM 6.1.

### Parameters

*InventoryContext*—You can specify the inventory context you want to retrieve:

- All device information.
- Device configuration information.
- Device monitor information.

### Return Value

A list of all the network elements in MWTM 6.1.

## Get Root Network Elements from MWTM

```
NetworkElementList getRootNEs (InventoryContext)
```

This method retrieves the root inventory objects from MWTM 6.1. Root objects can be node type or RanBackhaul type.

### Parameters

*InventoryContext*—You can specify the inventory context you want to retrieve:

- All device information.
- Device configuration information.
- Device monitor information.

**Return Value**

A list of all the network elements in MWTM 6.1.

## Get One Network Element from MWTM

```
NetworkElementList getNE (String FQDN, InventoryContext)
```

This method retrieves one network element object from MWTM 6.1.

**Parameters**

*String FQDN*—Fully qualified domain name

*InventoryContext*—You can specify the inventory context you want to retrieve:

- All device information.
- Device configuration information.
- Device monitor information.

**Return Value**

The network elements in MWTM 6.1 for given FQDN.

## Get Child Network Elements from MWTM

```
NetworkElementList getChildNEs (String FQDN, InventoryContext)
```

This method retrieves a list of children network element objects from MWTM 6.1.

**Parameters**

*String FQDN*—Fully qualified domain name

*InventoryContext*—You can specify the inventory context you want to retrieve:

- All device information.
- Device configuration information.
- Device monitor information.

**Return Value**

A list of child network elements in MWTM 6.1 for a given FQDN.

## Get Descendant Network Elements from MWTM

```
NetworkElementList getDescendentNEs (String FQDN, InventoryContext)
```

This method retrieves a list of descendants network element objects from MWTM 6.1.

### Parameters

*String FQDN*—Fully qualified domain name

*InventoryContext*—You can specify the inventory context you want to retrieve:

- All device information.
- Device configuration information.
- Device monitor information.

### Return Value

A list of descendant network elements in MWTM 6.1 for a given FQDN.

## Get Note for an Inventory Object

```
String getNote (String FQDN)
```

This method gets attached note for an inventory object.

### Parameters

*String FQDN*—Inventory FQDN to retrieve the note

### Return Value

Note String

## Set Note for an Inventory Object

```
String setNote(String FQDN, String userid, String note)
```

This method sets the attached note for an inventory object.

### Parameters

*String FQDN*—Inventory FQDN to retrieve the note

*String userid*—User ID who sets the note

*String note*—Note text to set

### Return Value

None

## Append Note to an Inventory Object

```
String setNote (String FQDN, String userid, String note)
```

This method appends the note to an inventory object.

### Parameters

*String FQDN*—Inventory FQDN to retrieve the note

*String userid*—User ID who appends text to the inventory note

*String note*—Text to append to the inventory note

### Return Value

None





## CHAPTER 3

# MWTM 6.1 Event API

---

The Operations Support and System (OSS) sends Simple Object Access Protocol (SOAP) requests to MWTM 6.1. MWTM 6.1 responds with SOAP responses.

The MWTM 6.1 provides Remote Procedure Call (RPC) style Event API that accepts SOAP messages from OSS and responds with SOAP responses and traps.

The MWTM 6.1 sends unsolicited messages via traps to the OSS.

When generating a new event, the MWTM 6.1 can be configured to send this event to the Northbound OSS asynchronously via traps.

This chapter includes the following sections:

- [Event and Alarm Definitions, page 3-1](#)
- [Setting up MWTM 6.1 to Send Asynchronous Events to Northbound OSS, page 3-2](#)
- [MWTM 6.1 Event API Operations, page 3-3](#)

## Event and Alarm Definitions

An event is defined as a singular occurrence at a specific moment in time. Each event is associated with an event ID. An alarm is defined as a sequence of events that occur over a period of time. An alarm is associated with a single alarm ID for the duration of the events that define the alarm.

An example best illustrates this concept. When the temperature in a chassis exceeds a certain threshold, the MWTM reports a Minor alarm. When the temperature increases again, the MWTM escalates the alarm to Major. When the temperature increases a third time, the MWTM escalates the alarm to Critical. The alarm ID for this sequence remains constant.

The MWTM does not consider the clearing condition in a state transition sequence like the one described in the previous paragraph. For example, an ITP link may change state from Normal to Critical to Normal to Warning within the span of an hour. An event is created for each transition: from Normal to Critical, from Critical to Normal, and from Normal to Warning. These three events make up the event sequence of an ITP Link State alarm.

The system or a user deletes (archives) alarms. Cleared alarms are alarms that have the severity Normal. The system archives cleared alarms after one day (this is the default setting). The system archives uncleared alarms after seven days. After the system or a user archives an alarm, if the condition occurs again, the MWTM raises a new alarm with a new alarm ID.

To change alarm archive values, see “Changing Event Limits” in Chapter 9 of the *User Guide for the Cisco Mobile Wireless Transport Manager 6.1*.

# Setting up MWTM 6.1 to Send Asynchronous Events to Northbound OSS

To configure the MWTM 6.1 to send asynchronous events to the Northbound OSS, the system administrator must first configure the MWTM 6.1 Event Editor using the following procedure (for more information, see the *User Guide for the Cisco Mobile Wireless Transport Manager 6.1*).

## Procedure

- 
- Step 1** Start the MWTM 6.1 Event Editor, and load the current running configuration. To launch the MWTM 6.1 Event Editor, choose **Start > Programs > Cisco MWTM Client > Launch MWTM Event Editor** from the Windows Start menu. Or, choose **Tools > Event Editor** from the MWTM 6.1 Main Menu.
  - Step 2** Click the turner icon beside the **Event Configuration**, then click **SNMP Servers**. MWTM 6.1 displays the SNMP Servers Configuration window in the right pane, which contains nine fields or buttons. Add the target hostname, port, community string, SNMP version, and trap type that you want to forward the MWTM 6.1 events to. The recommended trap type is **CISCO-EPM**.
  - Step 3** Next, enable trap forwarding for all events by clicking the **Send a trap for all events** radio button in the SNMP Servers Configuration window of the MWTM 6.1 Event Editor.
  - Step 4** Optionally (de)select individual events under **Traps**, **Status Alarms**, or **User Actions** by checking or unchecking (clearing) the check box shown for each event.
  - Step 5** Optionally customize the Trap Events by clicking the turner icon beside the **Event Editor**, then click the turner icon beside **Traps**. MWTM 6.1 lists the currently defined traps in the left pane. To change an event, select the event in the left pane. MWTM 6.1 displays the Event Configuration panel in the right pane, which enables you to change all aspects of that event. The Event Configuration panel contains 13 fields or buttons. Set the following fields or buttons: **Category**, **Severity**, **Message Name**, and **Message** options for each event.
  - Step 6** To receive a trap when an event is updated or deleted, select the **Limits** tree item and edit the **SendUpdates** variable to read true. By default, SendUpdates is false and MWTM 6.1 will only send a trap for an event when the event is new.
  - Step 7** Adjust the **TrapGenThrottle** variable to specify the number of milliseconds to delay between sending traps. This setting can help ensure that MWTM 6.1 sends traps at rate that the receiving application can handle. If this value is too low, MWTM 6.1 might send traps at a rate that is too fast for the receiving application.
  - Step 8** Adjust the **HeartbeatTrapInterval** variable to specify the number of seconds to delay between sending a heartbeat trap.
  - Step 9** Choose **File > Deploy** to save the event configuration.
  - Step 10** Restart the MWTM 6.1 server for the new event configuration to take effect.
-

# MWTM 6.1 Event API Operations

This section lists the MWTM 6.1 Event API operations.

All the operations are listed as pseudocode with comments. The syntax for these operations is defined as Web Services Description Language (WSDL). This syntax is described in [Appendix A, “MWTM 6.1 NBAPI WSDL and XSD Definitions”](#).

All MWTM 6.1 Event API operations use SOAP fault for error handling. These error codes are defined in [Appendix B, “MWTM 6.1 NBAPI Error Codes”](#).

## Get all Events from MWTM

```
int getAllEventsAsTraps (TrapTarget target)
```

This method retrieves all the events from MWTM 6.1 as traps.

### Parameters

*TrapTarget target*—Specifies the target to send the MWTM 6.1 event traps. The following parameters can be specified:

*Hostname*—Hostname or IP address to send the traps to.

*Port Number* —Port number to send the traps to.

*Community String*—Community string to fit the trap.

*SNMP Version*—Simple Network Management Protocol (SNMP) version for the traps: 1 or 2c.

*MIB*—Management Information Base (MIB) format to send the traps: CISCO-SYSLOG-MIB or CISCO-EPM-NOTIFICATION-MIB.

### Return Value

Number of events sent as a result of this method.

## Get Filtered Events from MWTM

```
int getFilteredEventsAsTraps (TrapTarget target, EventFilter filter)
```

This method retrieves the filtered events from MWTM 6.1 as traps.

### Parameters

*TrapTarget target*—Specifies the target to send the MWTM 6.1 event traps. The following parameters can be specified:

*Hostname*—Hostname or IP address to send the traps to.

*Port Number*—Port number to send the traps to.

*Community String*—Community string to fit the trap.

*SNMP Version*—SNMP version for the traps: 1 or 2c.

*MIB*—MIB format to send the traps: CISCO-SYSLOG-MIB or CISCO-EPM-NOTIFICATION-MIB.

*EventFilter filter*—Specifies the filter rules to retrieve the MWTM 6.1 event. These filters can be specified as standalone or combined together. If multiple filters are specified, they are applied using “AND” logic. The following parameters can be specified:

*Event ID*—Specifies a list of event IDs to filter.

*Start Date*—Specifies the starting date to filter the events.

*End Date*—Specifies the end date to filter the events.

*Severity*—Specifies a list of severities to filter the events. Valid severities can be customized in the the MWTM 6.1 Event Editor.

*Category*—Specifies a list of categories to filter the events. Valid event categories can be customized in the MWTM 6.1 Event Editor.

*Acknowledged*—Filter based on whether the events are acknowledged.

*Cleared*—Filter based on whether the events are cleared.

*Message Text*—Filter based on whether the events contain a given message text.

*Forward*—Filter based on whether the forward option is turned on for an event. Forward option for the events is configured using the MWTM 6.1 Event Editor.

*AlarmMode*—Filter based on alarms or events.

#### **Return Value**

Number of events sent as a result of this method.

## Clear Events

```
void clearEvents (EventIDList eventList, String userid, String note)
```

This method clears the specified events.

#### **Parameters**

*EventIDList eventList*—List of the events to clear.

*String userid*—User ID who cleared the events.

*String note*—Note explaining the reason for clearing this event.

#### **Return Value**

None

## Acknowledge Events

```
void acknowledgeEvents (EventIDList eventList, String userid, String note)
```

This method acknowledges the specified events.

#### **Parameters**

*EventIDList eventList*—List of the events to acknowledge.

*String userid*—User ID who cleared the events.

*String note*—Note explaining the reason for acknowledging the events.

**Return Value**

None

## Delete Events

```
void deleteEvents (EventIDList eventList)
```

This method deletes the specified events.

**Parameters**

*EventIDList eventList*—List of the events to delete.

**Return Value**

None

## Change Event Severity

```
void changeSeverities (EventIDList eventList, String severity, String userid, String note)
```

This method changes severity of specified events.

**Parameters**

*EventIDList eventList*—List of the events to change severity

*String severity*—The target severity to change. Valid severities can be customized in the MWTM 6.1 Event Editor.

*String userid*—User ID who changed the event severity.

*String note*—Note explaining the reason for changing the severity for the events.

**Return Value**

None

## Get Note for an Event

```
String getNote (long eventID)
```

This method gets an attached note for an event.

**Parameters**

*Long eventID*—Event ID to retrieve the note.

**Return Value**

None

## Set Note for an Event

```
String setNote (long eventID, String userid, String note)
```

This method sets an attached note for an event.

### Parameters

*long eventID*—Event ID to set the note.

*String userid*—User ID who sets the note.

*String note*—Note text to set to.

### Return Value

None

## Append Note to an Event

```
String appendNote (long eventID, String userid, String note)
```

This method appends a note to an event.

### Parameters

*long eventID*—Event ID to append the note to.

*String userid*—User ID who appends the text to the event note.

*String note*—Text to append to the event note.

### Return Value

None



# CHAPTER 4

## MWTM 6.1 Provision API

The MWTM 6.1 Provision API allows the Operations Support and System (OSS) to provision the IP Transfer Point (ITP) Linkset, Link, Application Server (AS), and ASP using a programming interface.

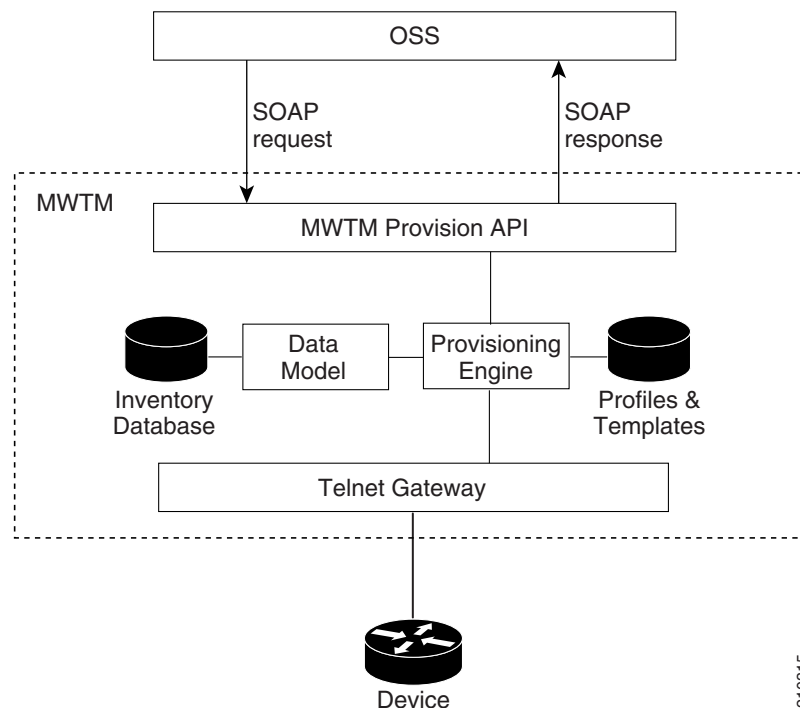
The MWTM 6.1 provides Remote Procedure Call (RPC) style Inventory API to the Northbound OSS. The OSS can send Simple Object Access Protocol (SOAP) requests to the MWTM 6.1 Inventory API, and the MWTM 6.1 responds with SOAP responses.

This chapter includes the following sections:

- [Setting up MWTM 6.1 to Retrieve Config Attributes from a Device, page 4-2](#)
- [Issuing Provision Requests, page 4-3](#)
- [Provision Request Logging, page 4-6](#)
- [MWTM 6.1 Provision API Operations, page 4-7](#)

A block diagram illustrating the MWTM 6.1 Provision system is shown in [Figure 4-1](#).

**Figure 4-1** MWTM 6.1 Provision Block Diagram



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As shown in the preceding block diagram, the MWTM 6.1 provides the Provision API to the Northbound OSS.

The OSS can send a SOAP request to the MWTM 6.1 Provision API. The MWTM 6.1 attempts to provision the device from the SOAP request. It then responds with SOAP responses.

The MWTM 6.1 Provision API is defined in the Web Service Definition Language (WSDL)<sup>1</sup>. It defines communication protocol and message exchanges between two remote applications.

## Setting up MWTM 6.1 to Retrieve Config Attributes from a Device

The MWTM 6.1 Inventory API provides two types of attributes (see [Chapter 2, “MWTM 6.1 Inventory API,”](#) for more detailed information):

- monitor attributes
- config attributes

### Monitor Attributes

The Monitor attributes are those attributes obtained from the Simple Network Management Protocol (SNMP) polling/status monitoring.

### Config Attributes

The Config attributes are those attributes obtained from the IOS running-config. The MWTM 6.1 provision feature requires the MWTM 6.1 to successfully retrieve the config attributes from a device.

To retrieve the config attributes from the device, you must supply the device credentials for the target device. You also need to ensure that the MWTM 6.1 is getting the IOS running-config from the device successfully.

## Setting up Device Credentials

You can specify the device credentials for all the nodes in an MWTM 6.1, or specify the credentials for an individual node (see the *User Guide for the Cisco Mobile Wireless Transport Manager 6.1* on how to specify credentials in MWTM 6.1).

## Getting IOS running-config from a Device

There are two ways the MWTM 6.1 can get an IOS running-config from a device:

- Automatic config sync
- Manual config sync

### Automatic Config Sync

By default, the MWTM 6.1 is installed with the automatic config sync option turned on. This option is specified by the `AUTO_CONFIG_SYNC` property in this file:

1. WSDL is a W3C recommendation (see <http://www.w3.org/TR/wsd1>).

```
#{MWTM_install_dir}/properties/System.properties
```

When the automatic config sync option is turned on, the MWTM 6.1 will try to get the IOS running-config from the device the following three ways:

- During every status poll, the MWTM 6.1 checks to see whether the running-config has changed on the device. If it has changed, then the MWTM 6.1 retrieves the running-config from the device.
- After the MWTM 6.1 processes a provision operation (from NBAPI or GUI), it automatically retrieves the running-config from the device.

When the automatic config sync option is turned off, then the MWTM 6.1 will not try to get the running-config from the device in the previous scenarios.

## Manual Config Sync

You might want to perform a manual config sync in certain scenarios. For example, you might turn off the automatic config sync and choose to manage the config sync from the device manually.

You can request a config sync from the device manually via the Northbound API (NBAPI), or via the Command Line Interface (CLI) tool. To request a config sync via the NBAPI, see the “[Sync from Device](#)” section on page 4-6. To request a config sync via the CLI tool, see [Chapter 8, “MWTM 6.1 NBAPI CLI Tools.”](#)

# Issuing Provision Requests

The Northbound OSS can issue a provision request via an Extensible Markup Language (XML) based provision request. A provision request is defined in Web Service Definition Language/XML Schema Definition (WSDL/XSD). See [Appendix A, “MWTM 6.1 NBAPI WSDL and XSD Definitions.”](#)

A provision request contains one or more operations. MWTM 6.1 executes this list of provision operations sequentially. These operations are described in the following sections:

- [Specifying Provision Operations, page 4-3](#)
- [IOS Write to Startup, page 4-6](#)
- [Sync from Device, page 4-6](#)

## Specifying Provision Operations

A provision operation operates on one network element (NE). On the network element, you can specify the following operations:

- ADD—See [ADD Operation, page 4-3](#)
- DELETE—See [MODIFY Operation, page 4-5](#)
- MODIFY—See [DELETE Operation, page 4-6](#)

## ADD Operation

In the ADD operation, you need to specify the ParentFQDN, type, and Relative Distinguished Name (RDN) attribute to identify the network element to add. You also need to specify any features to be added for this network element.

**Note**

A “Basic” feature is required for any provisionable NE.

The following is an example XML script for an ADD operation:

```
<ProvisionOperation type="Link" operation="add"
  parentFQDN="Node=sgm-26-96a.cisco.com,SP=ansi-config,Linkset=2696a_to_2696b">
  <Attribute name="RDN">0</Attribute>
  <Feature name="Basic">
    <AttributeGroup name="Interface">
      <Attribute name="InterfaceName">Serial0/0:0</Attribute>
    </AttributeGroup>
    <Attribute name="LinkType">MTP2</Attribute>
  </Feature>
  <Feature name="MTP2Timer">
    <Attribute name="MtT1Value">12500</Attribute>
    <Attribute name="MtT2Value">6000</Attribute>
    <Attribute name="MtT3Value">5000</Attribute>
    <Attribute name="MtT4nValue">2007</Attribute>
    <Attribute name="MtT4eValue">550</Attribute>
    <Attribute name="MtT5Value">90</Attribute>
    <Attribute name="MtT7Value">900</Attribute>
  </Feature>
  <Feature name="MTP2">
    <Attribute name="PCR">>true</Attribute>
    <Attribute name="PCRN1">34</Attribute>
    <Attribute name="TxDepthValue">50</Attribute>
  </Feature>
  <Feature name="CTParams">
    <Attribute name="CapacitySend">570000</Attribute>
    <Attribute name="ThresholdSend">7</Attribute>
    <Attribute name="ThresholdRcvd">7</Attribute>
  </Feature>
  <Feature name="LinkTimer">
    <Attribute name="LkT01Value">900</Attribute>
    <Attribute name="LkT02Value">900</Attribute>
    <Attribute name="LkT03Value">900</Attribute>
    <Attribute name="LkT04Value">900</Attribute>
    <Attribute name="LkT05Value">900</Attribute>
    <Attribute name="LkT12Value">900</Attribute>
    <Attribute name="LkT13Value">900</Attribute>
    <Attribute name="LkT14Value">2500</Attribute>
    <Attribute name="LkT17Value">800</Attribute>
    <Attribute name="LkT19Value">480000</Attribute>
    <Attribute name="LkT20Value">91111</Attribute>
    <Attribute name="LkT21Value">90000</Attribute>
    <Attribute name="LkT31Value">11111</Attribute>
    <Attribute name="LkT32Value">11111</Attribute>
    <Attribute name="LkSLTT01Value">4000</Attribute>
    <Attribute name="LkSLTT02Value">90000</Attribute>
    <Attribute name="LkRetryValue">90000</Attribute>
  </Feature>
</ProvisionOperation>
```

## MODIFY Operation

In a MODIFY operation, you need to specify the ParentFQDN, type, and RDN attribute to identify the network element to modify. You also need to specify all the necessary features for this NE.

You might use the MODIFY operation request to add/delete/modify features. When processing a MODIFY operation request, the MWTM 6.1 compares the list of features specified in the Northbound API (NBAPI) against the list of features on the target device:

- If a feature does not exist on the device, but exists in the NBAPI request, then the MWTM 6.1 adds this feature to the target device;
- If a feature exists on the device, but does not exist in NBAPI request, then the MWTM 6.1 deletes this feature from target device;
- If a feature exists in both places, then the MWTM 6.1 compares whether the attributes in these two features are the same. If they are different, then the MWTM 6.1 modifies this feature on target device.



### Note

A “Basic” feature is required for any provisionable NE.

The following is an example XML script for an MODIFY operation:

```
<ProvisionOperation type="Link" operation="modify"
  parentFQDN="Node=sgm-26-96a.cisco.com,SP=ansi-config,Linkset=2696a_to_2696b">
  <Attribute name="RDN">0</Attribute>
  <Feature name="Basic">
    <AttributeGroup name="Interface">
      <Attribute name="InterfaceName">Serial0/0:0</Attribute>
    </AttributeGroup>
    <Attribute name="LinkType">MTP2</Attribute>
  </Feature>
  <Feature name="MTP2Timer">
    <Attribute name="MtT1Value">12501</Attribute>
    <Attribute name="MtT2Value">6001</Attribute>
    <Attribute name="MtT3Value">5001</Attribute>
    <Attribute name="MtT4nValue">2006</Attribute>
    <Attribute name="MtT4eValue">551</Attribute>
    <Attribute name="MtT5Value">91</Attribute>
    <Attribute name="MtT7Value">901</Attribute>
  </Feature>
  <Feature name="Description">
    <Attribute name="Description">New Link Description</Attribute>
    <Attribute name="DisplayName">New Link Display Name</Attribute>
  </Feature>
  <Feature name="CTParams">
    <Attribute name="CapacitySend">570000</Attribute>
    <Attribute name="ThresholdSend">7</Attribute>
    <Attribute name="ThresholdRcvd">7</Attribute>
  </Feature>
  <Feature name="LinkTimer">
    <Attribute name="LkT01Value">900</Attribute>
    <Attribute name="LkT02Value">900</Attribute>
    <Attribute name="LkT03Value">900</Attribute>
    <Attribute name="LkT04Value">900</Attribute>
    <Attribute name="LkT05Value">900</Attribute>
    <Attribute name="LkT12Value">900</Attribute>
    <Attribute name="LkT13Value">900</Attribute>
    <Attribute name="LkT14Value">2500</Attribute>
    <Attribute name="LkT17Value">800</Attribute>
    <Attribute name="LkT19Value">480000</Attribute>
  </Feature>
</ProvisionOperation>
```

```

    <Attribute name="LkT20Value">91111</Attribute>
    <Attribute name="LkT21Value">90000</Attribute>
    <Attribute name="LkT31Value">11111</Attribute>
    <Attribute name="LkT32Value">11111</Attribute>
    <Attribute name="LkSLTT01Value">4000</Attribute>
    <Attribute name="LkSLTT02Value">90000</Attribute>
    <Attribute name="LkRetryValue">90000</Attribute>
  </Feature>
</ProvisionOperation>

```

## DELETE Operation

In a DELETE operation, you need to specify the ParentFQDN, type, and RDN attribute to identify the network element to delete from the device. You do not need to specify any features on the NE.

The following is an example XML script for an DELETE operation:

```

<ProvisionOperation type="Link" operation="delete"
  parentFQDN="Node=sgm-26-96a.cisco.com,SP=ansi-config,Linkset=2696a_to_2696b">
  <Attribute name="RDN">0</Attribute>
</ProvisionOperation>

```

## IOS Write to Startup

This operation requests the IOS device to save the **running-config** to the **startup-config** on the device. You must specify a Node to perform this operation on.

The following is an example XML script for the IOS write to startup operation:

```

<IOSWriteToStartup FQDN="Node=sgm-26-96a"></IOSWriteToStartup>

```

## Sync from Device

This operation syncs the IOS **running-config** from the device into the MWTM 6.1 repository. You must specify a Node to perform this operation.

The following is an example XML script for the sync from the device operation:

```

<SyncFromDevice FQDN="Node=sgm-26-96a"></ SyncFromDevice>

```

# Provision Request Logging

The MWTM 6.1 provision request log is kept at:

```

${MWTM_install_dir}/logs/provisionLogs/

```

The log file names are identified by the provision request ID.

The following is an example log file of /opt/CSCOSgm/logs/provisionLogs/Provision\_1647152932250386401.log:

```

ADD [started]: Node=sgm-26-96b.cisco.com,SP=ansi-config,Linkset=TST0,Link=5

```

```

Configlet:
cs7 instance 0 linkset TST0
  link 5 sctp 1.1.1.5 2323 10020 passive draft2
cs7 instance 0 linkset TST0
  link 5
  fast-cwnd-rate 50
  idle-cwnd-rate 50
  init-cwnd-size 3000
  retransmit-cwnd-rate 50
cs7 instance 0 linkset TST0
  link 5
  peer-timer t01 45000
  peer-timer t06 4000

```

#### Response:

```

config terminal
Enter configuration commands, one per line. End with CNTL/Z.
sgm-26-96b(config)#cs7 instance 0 linkset TST0
sgm-26-96b(config-cs7-ls)# link 5 sctp 1.1.1.5 2323 10020 passive draft2
sgm-26-96b(config-cs7-ls-link)#cs7 instance 0 linkset TST0
sgm-26-96b(config-cs7-ls)# link 5
sgm-26-96b(config-cs7-ls-link)# fast-cwnd-rate 50
sgm-26-96b(config-cs7-ls-link)# idle-cwnd-rate 50
sgm-26-96b(config-cs7-ls-link)# init-cwnd-size 3000
sgm-26-96b(config-cs7-ls-link)# retransmit-cwnd-rate 50
sgm-26-96b(config-cs7-ls-link)#cs7 instance 0 linkset TST0
sgm-26-96b(config-cs7-ls)# link 5
sgm-26-96b(config-cs7-ls-link)# peer-timer t01 45000
sgm-26-96b(config-cs7-ls-link)# peer-timer t06 4000
sgm-26-96b(config-cs7-ls-link)#
end

```

ADD [completed]: Node=sgm-26-96b.cisco.com,SP=ansi-config,Linkset=TST0,Link=5

## MWTM 6.1 Provision API Operations

This section lists the MWTM 6.1 Provision API operations.

All the operations are listed as pseudo-code with comments. Syntax for these operations is defined in Web Service Definition Language/XML Schema Definition (WSDL/XSD). See [Appendix A, “MWTM 6.1 NBAPI WSDL and XSD Definitions.”](#)

All MWTM 6.1 Event API operations use the SOAP fault for error handling. The error codes are defined in [Appendix B, “MWTM 6.1 NBAPI Error Codes.”](#)

## Process Provision Request

```
long provision(ProvisionRequest request)
```

This method retrieves all the events from MWTM 6.1 as traps.

#### Parameters:

*ProvisionRequest request*—You can specify the provision request (see [Issuing Provision Requests, page 4-3](#) for a detailed description of the provision request).

**Return Value:**

Provision request ID.



## CHAPTER 5

# Customizing MWTM 6.1 GUI Troubleshooting Commands

---

The MWTM GUI provides a Troubleshooting tab that enables operators to run commonly used IOS commands on nodes and objects that the MWTM manages. Most of these IOS commands require no user input and are run on the object when you click the Execute button.

Some commands require user input to complete. You identify user-input commands by the ellipsis (...) that follows the command. For example:

```
APN Statistics for APN Input...
```

The following sections in this chapter describe how to create troubleshooting commands for the MWTM GUI:

- [Creating User-Defined Variables, page 5-1](#)
- [Creating User-Defined Commands, page 5-5](#)

For information about the troubleshooting features of the MWTM, see the *User Guide for the Cisco Mobile Wireless Transport Manager 6.1*.

## Creating User-Defined Variables

The following topics describe how to define a variable in a troubleshooting command:

- [Understanding System-Defined and User-Defined Input Data, page 5-2](#)
- [Understanding the User Variable File and Format, page 5-2](#)
- [Understanding the Regular Expression, page 5-3](#)
- [Cautions about White Space in the REGEX, page 5-3](#)
- [Undefined Variable Error Messages, page 5-4](#)

## Understanding System-Defined and User-Defined Input Data

The MWTM provides two files for controlling input data:

File Name and Location	Description
/opt/CSCOsgm/etc/SystemDefinedInputData.ts	Enables <i>Cisco engineers</i> to define system-level variables for the MWTM GUI.
/opt/CSCOsgm/etc/UserDefinedInputData.ts	Enables <i>MWTM system administrators</i> to define user-defined variables for the MWTM GUI.

If you want to modify a command that is already defined in **SystemDefinedInputData.ts**, you *redefine* it in **UserDefinedInputData.ts**. This approach allows you to change the way the MWTM GUI queries its users.



### Note

Changes to these two files do not require a restart of the server. However, you must restart the GUI client.

## Understanding the User Variable File and Format

To define a user variable in the **UserDefinedInputData.ts** file (see [Understanding System-Defined and User-Defined Input Data, page 5-2](#)), create a line with this format:

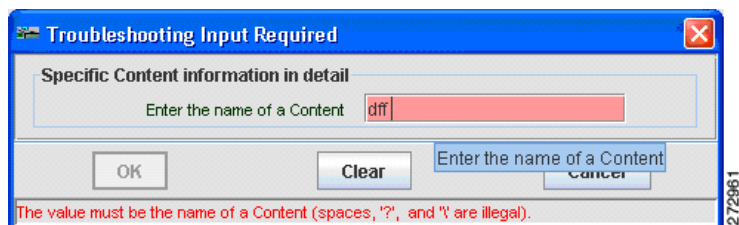
```
UserVariable=label string| tool tip text|regular expression| formatting error message
```

### Example 1—User-Defined Variables

```
CsgContent= Enter the name of a Content| Enter the name of a Content  
Content|IOS_WORD_WITH_SPECIAL_CHARS| The value must be the name of a Content (spaces, '?',  
and '\' are illegal).
```

The resulting user input window for this variable is shown in [Figure 5-1](#):

**Figure 5-1** Troubleshooting Input Required for CSG Content



Notice the correlation between the values in the columns of the **CsgContent** variable and the fields in the resulting window:

User Variable Column	Window Fields in <a href="#">Figure 5-1</a>
label string	Enter the name of a Content
tool tip text	Enter the name of a Content

User Variable Column	Window Fields in <a href="#">Figure 5-1</a>
regular expression	IOS_WORD_WITH_SPECIAL_CHARS
formatting error message	The value must be the name of a Content (spaces, '?', and '\' are illegal)

### Example 2—User-defined Variables

To define **CsgContent** without a tool tip, leave the tool tip column (column 2) empty. No tool tip would appear in the resulting window. The format for this line would be:

```
CsgContent= Enter the name of a Content | |IOS_WORD_WITH_SPECIAL_CHARS| The value must be
the name of a Content (spaces, '?', and '\' are illegal).
```

## Understanding the Regular Expression

To use a regular expression (REGEX) when creating a user variable, you must first define the REGEX in the **UserDefinedInputData.ts** file. The REGEX must follow this format:

```
REGEX (REGEX_NAME,REGULAR_EXPRESSION)
```

In the previous example ([Example 1—User-Defined Variables, page 5-2](#)), **IOS\_WORD\_WITH\_SPECIAL\_CHARS** is a defined regular expression and appears in the **UserDefinedInputData.ts** file like this:

```
REGEX (IOS_WORD_WITH_SPECIAL_CHARS, [.^\\?\\s]+)
```

Defining a REGEX is not a requirement. For example, if we chose not to define a REGEX in [Example 1—User-Defined Variables, page 5-2](#), then the user variable would need to be:

```
CsgContent= Enter the name of a Content | Enter the name of a Content | [.^\\?\\s]+ |
The value must be the name of a Content (spaces, '?', and '\' are illegal).
```

This approach is acceptable, however:

- If you do not define a REGEX, then you will not be able to reuse it when creating other user variables where the expression might be needed. For example, the variables `ip_subnet` and `ip_address` both use this defined regular expression: `IP_ADDRESS`.
- If you do not define a REGEX, then you must be careful not to insert extraneous white space (spaces or tabs) in the regular expression within the user variable. The MWTM attempts to interpret extraneous white space before or after the expression between the delimiters. See [Cautions about White Space in the REGEX, page 5-3](#), for more information.

## Cautions about White Space in the REGEX

Continuing with our example, assume that we do not define a REGEX for the **CsgContent** variable but include the regular expression like this:

```
CsgContent= Enter the name of a Content | Enter the name of a
Content |     [.^\\?\\s]+     | The value must be the name of a Content (spaces, '?', and
'\' are illegal).
```

In this case, we inserted five spaces before and after the `[.^\\?\\s]+` expression. This extraneous white space means that the name of the CSG content must begin with five spaces and end with five spaces. Of course, requiring the user to enter these spaces is not desirable!

But if we defined the REGEX as follows:

```
REGEX(IOS_WORD_WITH_SPECIAL_CHARS, [.^\\?\s]+)
```

and then created the user variable with extraneous white space around the defined REGEX:

```
CsgContent= Enter the name of a Content| Enter the name of a
Content|   IOS_WORD_WITH_SPECIAL_CHARS   | The value must be the name of a Content
(spaces, '?', and '\' are illegal).
```

then the extra white space is ignored and the user is not required to enter spaces before or after the CSG content value.

Remember, you must never have extra spaces in the defined REGEX (unless you intend the spaces to be part of the REGEX).

For example, this REGEX is valid:

```
REGEX(IOS_WORD_WITH_SPECIAL_CHARS, [.^\\?\s]+)
```

but this REGEX is not valid:

```
REGEX(IOS_WORD_WITH_SPECIAL_CHARS,   [.^\\?\s]+   )
```

Also, by defining a REGEX, you only have to be careful about white space once. Thereafter, when using the REGEX to create user variables, you only need to insert the REGEX name in the correct column of the user variable.


**Note**

The MWTM trims white space around other elements of the user variable (for example, the label string and tool tip text). But the MWTM does not trim extraneous white space around the REGEX.

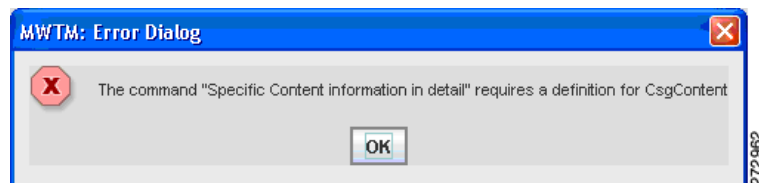
## Undefined Variable Error Messages

If you use a variable that has not been defined, the MWTM returns an error message when you run the command. For example, if you run this command:

```
CSG2 Application Traffic - System, CSG2, show ip csg content name %CsgContent detail,
Specific Content information in detail
```

but you did not previously define `%CsgContent` in the `UserDefinedInputData.ts` file, the MWTM produces the error dialog box shown in [Figure 5-2](#):

**Figure 5-2** Error Dialog for Undefined User Variable



## Creating User-Defined Commands

The MWTM troubleshooting framework supports Managed Information Base (MIB) capabilities. An MWTM engineer defines a MIB capability as a set of variables that can optionally span multiple MIBs belonging to a node. For example, the C7600 MIB capability defines variables that only a Cisco 7600 node can have.

The following topics describe how to create or modify commands that define MIB capabilities:

- [Understanding System-Defined and User-Defined Commands, page 5-5](#)
- [Understanding the Command Syntax, page 5-5](#)
- [Defining User Commands, page 5-6](#)
- [Defining Conditions, page 5-8](#)

### Related Topics

For a list of the MIB capabilities defined for MWTM 6.1, see [Appendix J, “MWTM 6.1 MIB Capabilities”](#).

## Understanding System-Defined and User-Defined Commands

After you have defined variables in the `UserDefinedInputData.ts` file, you can use them to create user-defined commands. The MWTM provides two files for defining commands:

File Name and Location	Description
<code>/opt/CSCOsgm/etc/SystemCommands.ts</code>	Enables <i>Cisco engineers</i> to create commands.
<code>/opt/CSCOsgm/etc/UserCommands.ts</code>	Enables <i>MWTM system administrators</i> to modify these commands or create new ones.

Cisco defines commands in the `SystemCommands.ts` file. You can modify these commands or create new ones in the `UserCommands.ts` file.

## Understanding the Command Syntax

The syntax for defining commands is:

`<category>, <MIB capability>, <command>, <description>, <condition>`

where:

- `category`—is a user defined category used for grouping related commands
- `capability`—is one or more MIB capabilities. For a list of the capabilities defined for MWTM 6.1, see [Appendix J, “MWTM 6.1 MIB Capabilities”](#).
- `command`—is a valid IOS command string
- `description`—is a description of the command
- `condition`—is an optional parameter which, if present, must evaluate to true for the command to be displayed to the user. See [Defining Conditions, page 5-8](#).

**Notes**

- The “,” character is used as a field delimiter character and therefore may not be used within any of the fields.
- Any lines not entered in the above format will be ignored.

**Example**

For example, the following command is from the **SystemCommands.ts** file:

```
General, ALL, show interfaces, All network interfaces
```

Prior to this release (MWTM 6.1), the MIB capability column (ALL) was restricted to these MIB values:

Legacy MIB Capability Value	Used For
ITP	ITP nodes
CSR	Cell Site Router nodes
BWG	Broadband wireless gateway nodes
CSG2	CSG2 nodes
RAN_SVC	RAN service modules
ALL	All node types

These legacy MIB capabilities are still valid, but now any MIB capability can be included. For a list of the available capabilities, see [Appendix J, “MWTM 6.1 MIB Capabilities”](#).

## Defining User Commands

Continuing with the CSG content example, the following line appears in the **UserCommands.ts** file:

```
CSG2 Application Traffic - System, CSG2, show ip csg content name %CsgContent detail, Specific Content information in detail
```

**Note**

When adding a user-defined variable in the **UserCommands.ts** file, always include a % character in front of the user variable.

A single command can have more than one user-defined variable. The following command incorporates two user variables:

```
CSG2 Application Traffic - User, CSG2, show ip csg sessions users rtsp %ip_address %ip_subnet detail, RTSP Session users in detail for IP Address
```

### Example 1

This command example from the **SystemCommands.ts** file demonstrates the use of a new MIB capability:

```
SAMI, SAMI&HA, show sami ipcp statistics detail, Display SAMI ipcp statistics detailed information
```

In this example, the troubleshooting command (`show sami ipcp statistics detail`) will appear in the MWTM GUI only if the selected node has both SAMI and HA MIB capabilities. You can add (&) as many MIB capabilities as required.

## Example 2

If you want the AAA and (&) BBB capabilities or the CCC and (&) DDD capabilities (not real capabilities), enter the line in the file twice:

```
SAMI, AAA&BBB, show sami ipcp statistics detail, Display SAMI ipcp statistics detailed
information
SAMI, CCC&DDD, show sami ipcp statistics detail, Display SAMI ipcp statistics detailed
information
```

The troubleshooting command will appear only if the selected node has both AAA and BBB capabilities, or if the node has both CCC and DDD capabilities.

If a network node has all four capabilities, the troubleshooting command will only appear once in the MWTM GUI because the framework allows one only description (the fourth column) for each category (the first column). If your network had a node with all four capabilities, the description (Display SAMI ipcp statistics detailed information) would appear only once for the SAMI category.



### Note

You should always ensure the variable exists before you use it. For example, the following code fragment shows how you can ensure that an object exists before you invoke a method for that object:

```
$This.SysName && $This.SysName.startsWith("emssami")
```

In this example, `$This.SysName` is the object and `startsWith` is the method. When testing compound conditionals, the conditionals are tested left to right, and processing continues to the right only if the left conditional evaluates to true. So in this case, if `$This.SysName` evaluates to false (it does not exist), then the `startsWith` method will not be evaluated.

## Example 3

This example adds the show log command to the General category with the Description of System log.

The System log command appears in the drop-down menus of all nodes because of this line in the `SystemCommands.ts` file:

```
General, ALL, show log, System log
```

The ALL value ensures that the command can run on any managed node that has support for troubleshooting.

If you want to allow operators to run this command only on Cisco 7600 nodes that run the ITP feature, you can insert this line in the `UserCommands.ts` file:

```
General, C7600&ITP, show log, System log
```

Based on this line, MWTM operators can run the System log command only if they select a Cisco 7600 node that is configured as an ITP. If the operator selects an ITP node on a Cisco 7200 device or a RAN node on a Cisco 7600 device, the System log command will not appear in the MWTM GUI drop-down menus.

## Example 4

If you want to extend the System log command (see Example 3) to all devices that carry PWE3 traffic, use the MIB capability CISCO\_IETF\_PW\_MIB. For example:

```
General, CISCO_IETF_PW_MIB, show log, System log
```

Adding this line in the **UserCommands.ts** file enables MWTM operators to run the System log command on nodes that are carrying PWE3 traffic.

The **UserCommands.ts** file in our example now has these lines for the System log command:

```
General, C7600&ITP, show log, System log
General, CISCO_IETF_PW_MIB, show log, System log
```

With these lines, an MWTM operator can run the System log command on either a Cisco 7600 ITP node or a node that is carrying PWE3 traffic.

## Defining Conditions

The **SystemCommands.ts** and **UserCommands.ts** files allow an optional fifth column to appear in the command line. This fifth column allows you to define conditions (see [Understanding the Command Syntax, page 5-5](#)).

The Apache Velocity Engine evaluates the condition contained in the fifth column. To understand more about this tool and how to define conditions, read the documentation that is available at the [velocity.apache.org](http://velocity.apache.org) web site.

## Example 1

The following example is from the **SystemCommands.ts** file:

```
CS7, ITP, show cs7 $SP.InstanceID linkset $This.RDN, Current linkset, $This.NEType &&
($This.NEType == "Linkset")
```



### Note

The commas are delimiters that help you distinguish the contents of each column.

The velocity engine evaluates the condition shown in the fifth column based on the underlying managed object. In our example, if the MIB capability in column two (ITP) is satisfied, and the selected object is an ITP linkset, the command (shown in the third column) will appear in the Description drop-down menu if the operator chooses the CS7 category.

You can define conditions in the same way that you define regular expressions (see [Understanding the Regular Expression, page 5-3](#)). This approach facilitates reusing defined conditions in multiple commands and enables you to debug a condition once rather than many times.

The **SystemCommands.ts** file defines the condition contained in Example 1 as follows:

```
CONDITIONAL(LINKSET, $This.NEType && ($This.NEType == "Linkset"))
```

With this condition defined, the command definition shown in Example 1 becomes:

```
CS7, ITP, show cs7 $SP.InstanceID linkset $This.RDN, Current linkset, LINKSET
```

## Example 2

While %variables are used in *commands* for variable substitution, \$variables are used in *conditions* that determine whether to present a command to a user. The \$variables can be anything defined as a network element attribute for the currently selected object.

The following code fragment shows how a \$variables are evaluated in a conditional statement:

```
$This.NEType && $This.Type && ($This.Type != "ds1") && ($This.NEType == "Interface")
```

In this example:

- If **\$This.NEType** exists, the processing continues right.
- If **\$This.Type** exists, the processing continues right.
- If **\$This.Type** is not **ds1**, the processing continues right.
- If **\$This.NEType** is **Interface**, the current conditional evaluates to true and the current command is included in the list for the current object.

Network element attributes are listed in [Appendix E, “MWTM 6.1 Monitor Attributes”](#).

## Example 3

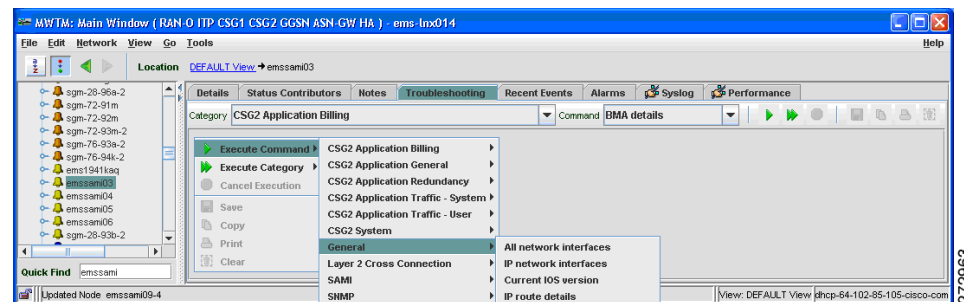
In the **SystemCommands.ts** file, this command definition appears:

```
General, ALL, show log, System log
```

This command, System log, will appear in the MWTM GUI for any managed node.

You can customize this command definition to allow MWTM operators to run the System log command only on managed nodes that begin with a specified naming convention. In this example, we would like to allow the show log command to appear for node names that begin with emssami (see [Figure 5-3](#) for example).

**Figure 5-3** Example of Node Name Beginning with emssami



**Note**

[Figure 5-3](#) demonstrates that the System log command does not appear in the GUI for emssami03, the node that is selected in the navigation tree (left pane).

[Table E-14](#) in [Appendix E, “MWTM 6.1 Monitor Attributes,”](#) describes attributes for managed nodes. This table shows that the SysName attribute provides the system name for a node:

```
SysName = sysName for Node
```

To restrict the node types that we want to define, we will use the `$This` variable. Adding the `Sysname` attribute from [Table E-14](#), we get:

```
$This.SysName.
```

Because we want to include only those nodes that start with `emssami`, we further define the variable like this:

```
$This.SysName.startsWith("emssami")
```

To ensure that `$This.SysName` will include the managed node that the MWTM operator selects in the navigation tree, we arrive at this definition:

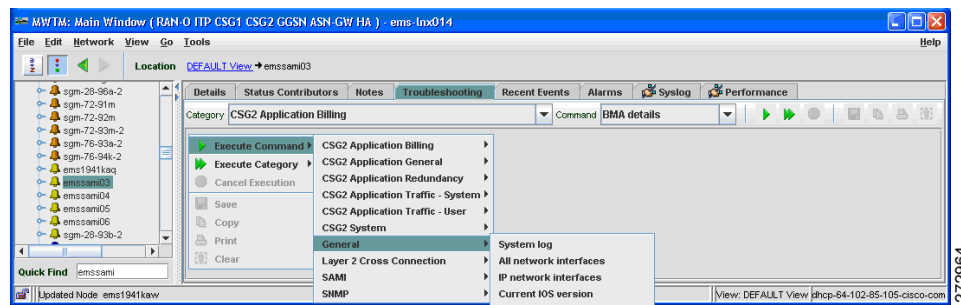
```
$This.SysName && $This.SysName.startsWith("emssami")
```

Now we can add the variable definition to the command definition in the `UserCommands.ts` file:

```
General, ALL, show log, System log, $This.SysName &&
$This.SysName.startsWith("emssami")
```

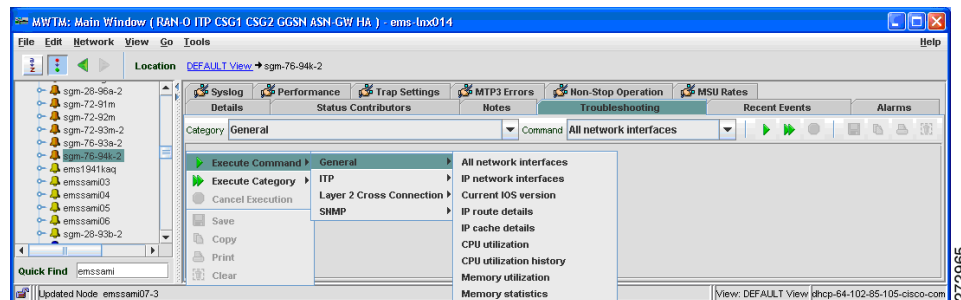
[Figure 5-4](#) shows an example of a node that matches the variable definition (that is, the selected node begins with `emssami`).

**Figure 5-4 Example of Node Matching Variable Definition**



If the MWTM operator selects a node that begins with anything other than `emssami`, the System log command does not appear in the GUI drop-down menu ([Figure 5-5](#)). Despite the fact that the MIB value is set to `ALL`, the System log command only appears for managed nodes that meet our naming convention.

**Figure 5-5 Example of Node Not Matching Variable Definition**



## Example 4

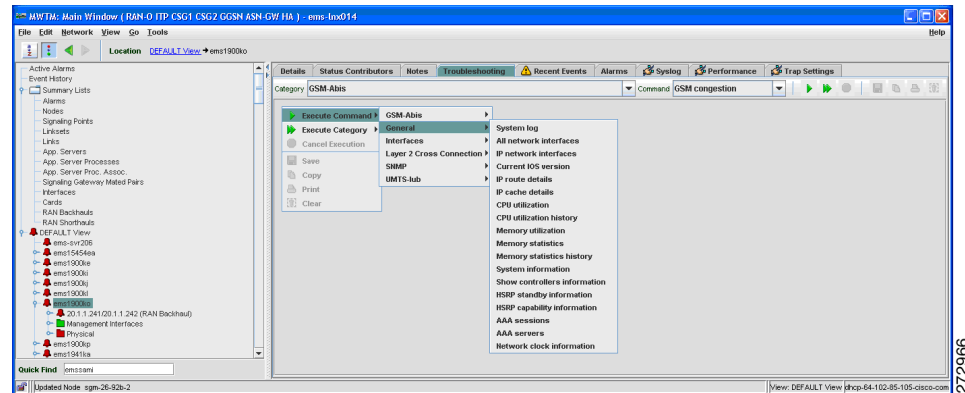
Building on the variable defined in Example 3, we will modify the definition to include node names that begin with ems19.

Our expanded variable definition becomes:

```
$This.SysName && ($This.SysName.startsWith("emssami02") ||
$This.SysName.startsWith("ems19"))
```

With this change, a node name beginning with ems19 now has the System log command appearing in the GUI drop-down menu (Figure 5-6).

**Figure 5-6** Example of Node Matching the Expanded Variable Definition



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## Example 5

Further expanding the variable defined in Example 4, we can restrict the System log command to appear only for top-level managed objects by adding another condition:

```
General, ALL, show log, System log,$This.SysName && $This.NEType &&
(($This.SysName.startsWith("emssami") || $This.SysName.startsWith("ems19")) &&
($This.NEType == "Node"))
```

In this example, the managed node must have the network element type (NEType) defined. The additional condition restricts the System log command to nodes and not to objects that subtend nodes in the tree hierarchy.





# CHAPTER 6

## Third-Party Applications and MWTM Integration

---

This chapter describes the interfaces by which you can integrate third-party applications and the Cisco Mobile Wireless Transport Manager (MWTM) 6.1. The MWTM enables administrators to configure:

- MWTM links to third-party applications
- Third-party application links to resources within the MWTM



**Note**

---

This chapter assumes that the MWTM is installed in `/opt/CSCOs/gm/`.

---

The following sections describe how to integrate third-party applications with MWTM 6.1:

- [Linking from Third-Party Applications to MWTM, page 6-1](#)
- [Linking from MWTM to Third-Party Applications, page 6-5](#)
- [A Summary of the Supported Object Types, page 6-10](#)

### Linking from Third-Party Applications to MWTM

You can integrate third-party applications with MWTM by opening specially formatted Uniform Resource Locators (URLs). These URLs contain parameters that uniquely identify the MWTM resource you want to display.

The following sections describe the URL syntax that the MWTM recognizes:

- [Passing Parameters to MWTM, page 6-2](#)
- [Selecting a Navigation Tree Item, page 6-2](#)
- [Selecting a Network Element, page 6-2](#)
- [Selecting a Tab Associated with a Network Element, page 6-2](#)
- [Launching Historical Reports, page 6-3](#)
- [Launching Troubleshooting, page 6-4](#)

## Passing Parameters to MWTM

You pass parameters to the MWTM web application through the URL query string. All URL query strings that are used to launch the MWTM use these standards:

- The URL query string is the portion of the URL that follows the first question mark (?).
- Each parameter has a name and value and has the format <name>=<value>.
- Substitute the space character contained in parameter values with %20.
- An ampersand (&) separates each parameter. The full URL interprets these parameters.
- Parameter names and values are case sensitive.

The parameters that the MWTM recognizes typically affect the content that displays. For example, the Fully Qualified Domain Name (FQDN) identifies the navigation tree item to select. The parameters that the MWTM does not recognize have no affect.

For more information about standards for URL query strings, refer to various web sites that discuss RFC1738 - Uniform Resource Locators (URL).

## Selecting a Navigation Tree Item

When making a navigation tree selection, provide the FQDN parameter. The URL in this example demonstrates how to select Event History in the navigation tree:

```
http://mwtm-svr:1774/?FQDN=eventHistory
```

See [Table 6-5 on page 6-10](#) for a list of recognized FQDNs for navigation tree objects.

## Selecting a Network Element

Provide the FQDN parameter when selecting a network element. The value for this parameter must be an FQDN that uniquely identifies a network element. For example, this URL selects the node with the name cisco1941:

```
http://mwtm-svr:1774/?FQDN=Node=cisco1941
```

You can also select a node by its primary IP address:

```
http://mwtm-svr:1774/?FQDN=Node=172.18.17.14
```

For the steps to build a network element FQDN, see [Building Fully Qualified Domain Names, page 2-4](#).

## Selecting a Tab Associated with a Network Element

Using this format, third-party applications can launch the MWTM to a specific tab by opening a specially formatted URL:

```
<protocol>://<web_server>:<web_server_port>/?FQDN=<fqdn>&selectionId=<selection_id>
[&subSelectionId=<sub_selection_id>]
```

The angled brackets in this URL format denote variables. The square brackets denote optional portions of the URL. [Table 6-1](#) describes the variables and their legal values.

**Table 6-1** Variables for Selecting a Tab Associated with a Network Element

Variable	Description	Legal Value	Example
protocol	The protocol to use: HTTP or HTTPS	http https	http
web_server	The host address of the web server on which the MWTM is installed	The address of any host on which the MWTM is installed	mwtm-svr
web_server_port	The port of the web server on which the MWTM is installed	The port number to access the MWTM web application	1774
selection_id	The top-level choice to select (typically a tab that belongs to a top-level tab pane)	Any selection listed in <a href="#">Table 6-6</a> that is a top-level choice	events
sub_selection_id	The non-top-level choice to select (typically a tab that belongs to a non-top-level tab pane)	Any selection listed in <a href="#">Table 6-6</a> that is not a top-level choice	mIrriggerConfig

This example demonstrates how to select the Events tab associated with a node:

```
http://mwtm-svr:1774/?FQDN=Node=cisco1941&selectionId=events
```

See [Table 6-6 on page 6-12](#) for a list of recognized page selections.

## Launching Historical Reports

Third-party applications can launch MWTM historical reports by opening a specially formatted URL:

```
<protocol>://<web_server>:<web_server_port>/?FQDN=<report_type_category_FQDN>&reportTypeId=<report_type_id>
```

The angled brackets in this URL format denote variables. [Table 6-2](#) describes the variables and their legal values.

**Table 6-2** Variables for Launching Historical Reports

Variable	Description	Legal Value	Example
protocol	The protocol to use: HTTP or HTTPS	http https	http
web_server	The host address of the web server on which the MWTM is installed	The address of any host on which the MWTM is installed	mwtm-svr
web_server_port	The port of the web server on which the MWTM is installed	Port number to access the MWTM web application	1774

**Table 6-2 Variables for Launching Historical Reports (continued)**

Variable	Description	Legal Value	Example
report_type_category_FQDN	The fully qualified domain name of a report type category to be selected in the navigation tree	Any report type category FQDN in <a href="#">Table 6-7</a>	linkReports
report_type_id	The report type that is to be shown	Any report type identifier in <a href="#">Table 6-7</a>	linkHourly

## Launching Troubleshooting

Third-party applications can launch MWTM troubleshooting by opening a specially formatted URL:

```
<protocol>://<web_server>:<web_server_port>/?FQDN=<network_element_FQDN>&selectionId=troubleshooting&categoryId=<category> [&commandId=<command>]
```

The angled brackets in this URL format denote variables. The square brackets denote optional portions of the URL. [Table 6-3](#) describes the variables and their legal values.

**Table 6-3 Variables for Launching Troubleshooting**

Variable	Description	Legal Value	Example
protocol	The protocol to use: HTTP or HTTPS	http https	http
web_server	The host address of the web server on which the MWTM is installed	The address of any host on which the MWTM is installed	mwtm-svr
web_server_port	The port of the web server on which the MWTM is installed	Port number to access the MWTM web application	1774
network_element_FQDN	The fully qualified domain name of a network element that supports troubleshooting	Any FQDN associated with a network element	Node=cisco7600
category	The category to be selected. If no command is specified then this category is run.	Any category identifier defined in <b>UserCommands.ts</b> or <b>SystemCommands.ts</b> (in the <i>/etc</i> directory where MWTM is installed)	General
command	Identifies the command to be selected and run. This parameter is not present if a category is being run.	Any command identifier defined in <b>UserCommands.ts</b> or <b>SystemCommands.ts</b> (in the <i>/etc</i> directory where MWTM is installed)	System log

# Linking from MWTM to Third-Party Applications

The MWTM provides a method for extending its user interface with third-party launch commands. These launch commands create links to third-party applications from within the MWTM web and Java client interfaces.

The XML files in `/opt/CSCOSgm/etc/launch/` define these launch commands. When building a list of launch commands:

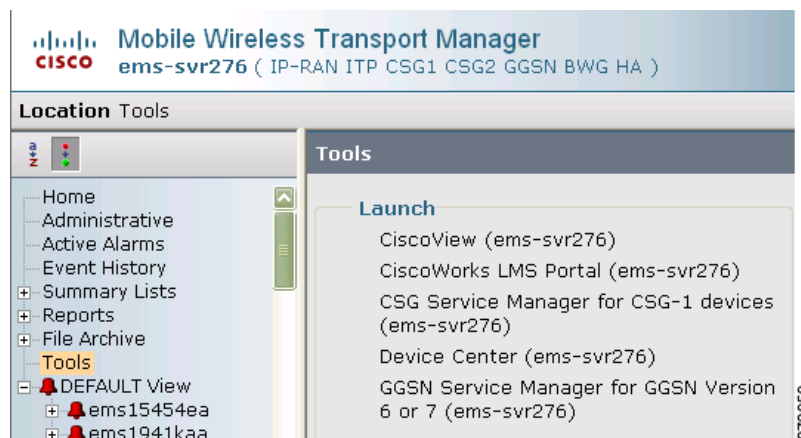
1. The MWTM parses only files that end in `.xml`.
2. The MWTM parses the launch commands each time a client connects to the server.
3. The client then caches the launch commands. If the launch commands change, then clients must restart to display the changes.

The MWTM provides a default set of launch command XML files. Some of these files do not end in `.xml` and are not enabled by default. You can enable them by renaming the files to end with `.xml`. For example, renaming `Cisco.launch.xml.example` to `Cisco.launch.xml` creates a launch command that will add a link to Cisco's website in the Tools menus of the MWTM client and web interfaces.

With these launch commands, you can associate various MWTM resources with links to third-party applications. For example, you might configure a node to have a link that opens a Telnet session to the node; the Telnet application is the third-party application that you integrate with the MWTM. The Telnet session link is context-sensitive; the primary IP address associated with the node is the target host for the Telnet session.

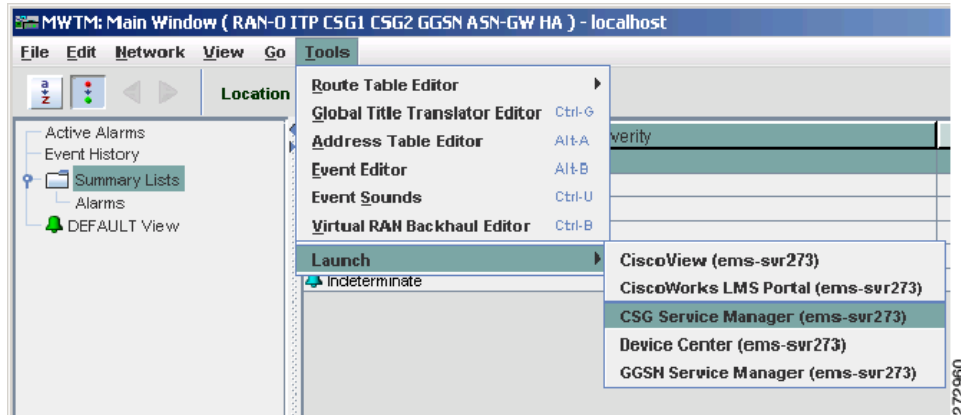
Links to third-party applications are available in the MWTM web interface appear as hyperlinks or menu items (see [Figure 6-1](#)).

**Figure 6-1** Launch Commands in the MWTM Web Interface



Links to third-party applications are available in the MWTM client interface as menu items in the Tools menu bar or as menu items in the context-sensitive right-click menus (see Figure 6-2).

**Figure 6-2** Launch Commands in the MWTM Client Interface



## Launch Command Definition Formats

The format of the launch command definition file follows the XML 1.0 specification. For example, this launch command creates a link to the Cisco website:

```
<?xml version="1.0" encoding="UTF-8"?>
<Launch type="URL" global="true">
  <!-- caption for the launch command -->
  <Caption>Browse www.cisco.com</Caption>

  <!-- URL for the launch command -->
  <Content>http://www.cisco.com</Content>
</Launch>
```

The MWTM provides examples that help clarify the format of the launch command definition file. The examples are located in this directory: `/opt/CSCOSgm/etc/launch/`.

The following sections describe the tags in the launch command definition file:

- [Launch Command Root Element, page 6-7](#)
- [Launch Command Caption, page 6-7](#)
- [Launch Command Content, page 6-7](#)
- [Launch Command Restrictions, page 6-7](#)
- [Launch Command Context, page 6-9](#)
- [Launch Command Templates, page 6-9](#)

## Launch Command Root Element

The root XML element for a launch command is always Launch. The Launch element supports the attributes listed in [Table 6-4](#).

**Table 6-4** Launch Element Attributes

Attribute Name	Type	Values	Default
type	string	<ul style="list-style-type: none"> <li><b>URL</b>—The content of the launch command is a URL that opens in a web browser.</li> <li><b>Program</b>—The content is an operating system command.</li> </ul>	URL
global	boolean	<ul style="list-style-type: none"> <li><b>true</b>—The launch command appears in the Tools menu.</li> <li><b>false</b>—The launch command is specific to a resource and should not appear in the Tools menu.</li> </ul>	false

## Launch Command Caption

A single Caption element appears under the Launch element. The body of the Caption element can be any string that conforms to the syntax of a Velocity template. The MWTM uses the Velocity Template Engine (see the [velocity.apache.org](http://velocity.apache.org) web site) to evaluate the body of the Caption element.

## Launch Command Content

A single Content element appears under the Launch element. The Content element does not support attributes. The content can be any string that conforms to the syntax of a Velocity template. The MWTM uses the Velocity Template Engine (see the [velocity.apache.org](http://velocity.apache.org) web site) to evaluate the body of the Content element.

## Launch Command Restrictions

If a launch command should appear only to users who use a specific operating system or users with specific roles, then a Restrictions element should appear under the Launch element.

### Restricting Launch Commands by Operating System

Restrict a launch command to users of an operating system by nesting an OperatingSystem element under the Restrictions element. For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<Launch type="Program" id="ping">
  ...
  <!-- only show this launch command in Solaris -->
  <Restrictions>
    <OperatingSystem>Solaris</OperatingSystem>
  </Restrictions>
  ...
</Launch>
```

The body of the OperatingSystem element should be one of these:

- Solaris (or SunOS)
- Windows

- Linux

These elements are not case sensitive.

### Restricting Launch Commands by Roles

Restrict a launch command to users of specific operating system by nesting a Role or MinRole element under the Restrictions element.

To restrict a launch command to a minimum role:

```
<?xml version="1.0" encoding="UTF-8"?>
<Launch type="Program" id="ping">
  ...
  <!-- limited to Network Operators and higher -->
  <Restrictions>
    <MinRole>Network Operator</MinRole>
  </Restrictions>
  ...
</Launch>
```

To restrict a launch command to a specific set of roles:

```
<?xml version="1.0" encoding="UTF-8"?>
<Launch type="Program" id="ping">
  ...
  <!-- limited to Network Operators or Network Administrators -->
  <Restrictions>
    <Role>Network Operator</Role>
    <Role>Network Admin</Role>
  </Restrictions>
  ...
</Launch>
```

The body of the MinRole or Role element should be one of these:

- None
- User
- Power User
- Network Operator
- Network Admin
- System Admin
- 0 (corresponds to None)
- 1 (corresponds to User)
- 2 (corresponds to Power User)
- 3 (corresponds to Network Operator)
- 4 (corresponds to Network Admin)
- 5 (corresponds to System Admin)

These elements are not case sensitive.

## Launch Command Context

Use the following guidelines when you create launch command Context elements:

- If the launch command applies to only particular resources (which is typical), nest the Context element under the Launch element. For example, a launch command might be associated only with *nodes* and not *interfaces*.
- You can specify *conditions* by nesting Condition elements under the Context element. All conditions must be true to display a launch command within a specific context.
- You can create multiple contexts for a launch command by adding multiple Context elements. A launch command appears within a specific context if any context of the launch command applies. A launch command applies when all the contexts associated with that context are true.
- Use the syntax of a Velocity template when creating the body of each Condition element. The condition must be an expression that is either true or false. When other expression types are used, the launch command will be ignored.

For example, the following launch command is available only if the network element's subtype matches the string "CDT", which stands for (Cisco Database for Telecommunication).

```
<?xml version="1.0" encoding="UTF-8"?>
<!--
    The priority of this launch command is higher than the default
    zero because it is intended to override the default Home Page
    launch definition which shares the same ID.
-->
<Launch type="URL" id="homePage" priority="10">
  <!-- caption for the launch command -->
  <Caption>Cisco Database for Telecommunication (CDT)</Caption>

  <!-- URL for the launch command -->
  <Content>http://${Node.RDN}:8080</Content>

  <Context>
    <Condition>${This.NESubType} == "CDT"</Condition>
  </Context>
</Launch>
```

## Launch Command Templates

The Content, Caption, and Condition elements support the use of Velocity templates. The Velocity Template Engine (see <http://velocity.apache.org>) evaluates these templates and provides a simple syntax for token replacement. The Velocity Template Engine also supports normal flow control constructs such as FOR loops, IF-ELSE statements, and method calls.

You can refer to any system property in `/opt/CSCOsgm/properties/System.properties` within a Velocity template by using a token in this format:

```
System.PROPERTY_NAME
```

where PROPERTY\_NAME is the key for a property.

Other properties are available to the Velocity template based on the context within the user interface. For example, if the user has selected a node, then the node properties are available through the \$Node property.

# A Summary of the Supported Object Types

The MWTM third-party integration feature supports these object types:

Object Type	Description	For More Information
Inventory Tree	A tree structure organizes the network elements in the MWTM inventory. The inventory tree structure is similar to the MWTM client navigation tree.	For more information about inventory trees, see <a href="#">Understanding the MWTM Inventory Tree, page 2-1</a> . For a list of the navigation tree objects, see the table in <a href="#">Navigation Tree Objects, page 6-10</a> .
Fully Qualified Domain Names (FQDN)	A Fully Qualified Domain Name (FQDN) identifies a network element in the MWTM 6.1 inventory.	For more information about FQDNs, see <a href="#">Building Fully Qualified Domain Names, page 2-4</a> .
	Each FQDN component name consists of an object type and an object identifier.	For a list of the object types and object identifiers in MWTM 6.1, see <a href="#">Table 2-1 on page 2-5</a> .
Selection Objects	Navigation tree items.	See <a href="#">Selection Objects, page 6-12</a> .
Report Type Objects	Report type tree items.	See <a href="#">Report Type Objects, page 6-13</a> .

## Navigation Tree Objects

[Table 6-5](#) lists the navigation tree objects.

**Table 6-5** *Navigation Tree Objects*

Name	Identifier
Home	home
Administrative	administrative
Active Alarms	activeAlarms
Event History	eventHistory
Summary Lists	summaryLists
Summary Lists > Nodes	NodeSummaryList
Summary Lists > Signal Points	SignalingPointSummaryList
Summary Lists > Linksets	LinksetSummaryList
Summary Lists > Links	LinkSummaryList
Summary Lists > App. Servers	ApplicationServerSummaryList
Summary Lists > App. Server Processes	ApplicationServerProcessSummaryList
Summary Lists > App. Server Proc. Assoc.	ApplicationServerProcessAssociationSummaryList
Summary Lists > Signaling Gateway Mated Pairs	SignalingGatewayMatedPairSummaryList
Summary Lists > Interfaces	InterfaceSummaryList

**Table 6-5** *Navigation Tree Objects (continued)*

<b>Name</b>	<b>Identifier</b>
Summary Lists > Cards	CardSummaryList
Summary Lists > RAN Backhauls	RanBackhaulSummaryList
Summary Lists > RAN Shorthauls	RanShorthaulSummaryList
Summary Lists > Software Versions	softwareVersions
Summary Lists > Point Codes	pointCodeReports
Reports	Reports
Reports > Statistics	statisticsReports
Reports > Statistics > AS	asReports
Reports > Statistics > ASP	aspReports
Reports > Statistics > Events	eventReports
Reports > Statistics > Link	linkReports
Reports > Statistics > Linkset	linksetReports
Reports > Statistics > MLR	mlrReports
Reports > Statistics > MSU Rates	msuRatesReports
Reports > Accounting	accountingReports
Reports > Accounting > GTT	gttReports
Reports > Accounting > MTP3	mtp3Reports
File Archive	allExportReports
File Archive > Events	networkEventsExportReports
File Archive > Reports	reportsExportReports
File Archive > Reports > Custom	customExportReports
File Archive > Reports > Daily	dailyExportReports
File Archive > Reports > Hourly	hourlyExportReports
File Archive > Reports > Rolling	rollingExportReports
File Archive > Reports > AS	asExportReports
File Archive > Reports > ASP	aspExportReports
File Archive > Reports > GTT	gttExportReports
File Archive > Reports > Link	linkExportReports
File Archive > Reports > Linkset	linksetExportReports
File Archive > Reports > MLR	mlrExportReports
File Archive > Reports > MTP3	mtp3ExportReports
File Archive > Reports > Point Code	pointCodesExportReports
File Archive > Reports > Q752	q752ExportReports
<i>View root</i>	deviceRoot

## Selection Objects

Table 6-6 lists the navigation tree items.

**Table 6-6 Selection Objects**

Name	Identifier	Exists For	Type
Alarms	alarms	All network elements	Tab
Details	details	All network elements	Tab
Errors	errors	GSM interfaces, UMTS interfaces, and RAN backhauls	Tab
Events	events	All network elements	Tab
GTT Map Status	gttMapStatus	Signaling points	Tab
GTT Statistics	gttStatistics	Signaling points	Tab
Interface Details	interfaceDetails	Links	Tab
Interface Errors	interfaceErrors	Interfaces that support MIB-II statistics	Tab
Interface Performance	interfacePerformance	Interfaces that support MIB-II statistics	Tab
ITP Access Lists	itpAccessLists	Signaling points	Tab
Linkset Access Lists	linksetAccessLists	Non-virtual linksets	Tab
MLR Counters	mlrCounters	Signaling points (sub-tab of MLR details)	Tab
MLR Details	mlrDetails	Signaling points	Tab
MLR Trigger Config	mlrTriggerConfig	Signaling points (sub-tab of MLR details)	Tab
MLR Trigger Results	mlrTriggerResults	Signaling points (sub-tab of MLR details)	Tab
Non-Stop Operation	nonStopOperation	All network elements that support Non-Stop Operation	Tab
Notes	notes	All network elements	Tab
Performance	performance	GSM interfaces, UMTS interfaces, and RAN backhauls	Tab
Provision	provision	All network elements that support provisioning	Tab
Q752 Measurements	q752Measurements	Links	Tab
RAN Shorthauls	ranShorthauls	RAN backhauls	Tab
Reports	reports	All network elements with reports	Tab
Route Detail	routeDetail	Signaling points	Tab
SCTP Assoc. Config Details	sctpAssocConfigDetails	Links	Tab
SCTP Assoc. Stats Details	sctpAssocStatsDetails	Links	Tab
Shorthaul Errors	errors	RAN shorthauls	Tab
Shorthaul Performance	performance	RAN shorthauls	Tab

**Table 6-6** Selection Objects (continued)

Statistics	statistics	BWG nodes, CSG2 nodes, links, and linksets	Tab
Status Contributors	statusContributors	All network elements with children	Tab
Summary	summary	—	Tab
Syslog	syslog	All network elements that support Syslog	Tab
TDM Statistics	tdmStatistics	E1 and T1 DS1 interfaces	Tab
Trap Configuration	trapConfiguration	ITP nodes (requires role 4 or 5 privileges)	Tab
Trap Settings	trapSettings	MWR and RAN Service Module nodes (requires role 4 or 5 privileges)	Tab
Troubleshooting	troubleshooting	All network elements that support troubleshooting	Tab

## Report Type Objects

Table 6-7 lists the report type tree items.

**Table 6-7** Report Type Objects

Report Type Category	Report Type Category FQDN	Report Type Name	Report Type Identifier
MSU Rates	msuRatesReports	MSU Load 15 Minutes	itp15MinMsuLoad
MSU Rates	msuRatesReports	MSU Load Daily	itpDailyMsuLoad
MSU Rates	msuRatesReports	MSU Load Hourly	itpHourlyMsuLoad
MSU Rates	msuRatesReports	MSU Peaks 15 Minutes	itp15MinMsuPeaks
MSU Rates	msuRatesReports	MSU Peaks Daily	itpDailyMsuPeaks
MSU Rates	msuRatesReports	MSU Peaks Hourly	itpHourlyMsuPeaks
Point Codes	pointCodeReports	Point Codes	pointCodesReport
Link	linkReports	Link Daily	linkDaily
Link	linkReports	Link Hourly	linkHourly
Link	linkReports	Link Multi-Day	linkMultiDayReport
Link	linkReports	Link Peaks Daily	linkDailyPeaks
MTP3	mtp3Reports	MTP3 Accounting Daily	mtp3DailyAccounting
AS	asReports	AS Daily	asDaily
AS	asReports	AS Hourly	asHourly
AS	asReports	AS Peaks Daily	asDailyPeaks
ASP	aspReports	ASP Daily	aspDaily
ASP	aspReports	ASP Hourly	aspHourly
ASP	aspReports	ASP MTP3 Daily	aspDailyMtp3
ASP	aspReports	ASP MTP3 Peaks Daily	aspDailyMtp3Peaks
ASP	aspReports	ASP Peaks Daily	aspDailyPeaks

**Table 6-7 Report Type Objects (continued)**

Events	eventReports	Event Metrics	eventMetrics
GTT	gttReports	GTT Accounting Daily	gttDailyAccounting
MLR	mlrReports	MLR Aborts Daily	mlrDailyAborts
MLR	mlrReports	MLR Continues Daily	mlrDailyContinues
MLR	mlrReports	MLR Processed Daily	mlrDailyProcessed
MLR	mlrReports	MLR ResultInvokes Daily	mlrDailyResultInvokes
MLR	mlrReports	MLR RuleMatches Daily	mlrDailyRuleMatches
MLR	mlrReports	MLR SubTriggers Daily	mlrDailySubTriggers
MLR	mlrReports	MLR Triggers Daily	mlrDailyTriggers
Linkset	linksetStatisticsReports	Linkset Daily	linksetDaily
Linkset	linksetStatisticsReports	Linkset Hourly	linksetHourly
Linkset	linksetStatisticsReports	Linkset Peaks Daily	linksetDailyPeaks



# CHAPTER 7

## MWTM 6.1 Northbound Traps

MWTM 6.1 can be configured to send traps to the Northbound OSS.

To configure MWTM 6.1 to send traps, you must first configure MWTM 6.1 using the **MWTM Event Editor** (see the *User Guide for the Mobile Wireless Transport Manager 6.1* for details on how to use the **MWTM Event Editor**).

MWTM 6.1 can be configured to send either of the following two types of traps:

- CISCO-SYSLOG-MIB :: clogMessageGenerated
- CISCO-EPM-NOTIFICATION-MIB :: ciscoEpmNotificationAlarmRev1

### CISCO-SYSLOG-MIB :: clogMessageGenerated

MWTM 6.1 can generate the CISCO-SYSLOG-MIB :: clogMessageGenerated trap, but this trap does not support the updating/deleting of existing events.

To support the updating/deleting of events and allow the Northbound OSS and MWTM 6.1 to maintain a consistent view of events, you should configure the MWTM 6.1 to send the CISCO-EPM-NOTIFICATION-MIB :: ciscoEpmNotificationAlarmRev1.

[Table 7-1](#) describes the Clog attributes.

**Table 7-1** Clog Attributes

Attribute Name	OID	Value
clogHistFacility	1.3.6.1.4.1.9.9.41 .1.2.3.1.2	Name of the facility that generated this message.
clogHistSeverity	1.3.6.1.4.1.9.9.41 .1.2.3.1.3	The severity of the message.
clogHistMsgName	1.3.6.1.4.1.9.9.41 .1.2.3.1.4	Text identification for the message type. <b>Note</b> The default value is MWTM. You can customize this field using the <b>MWTM Event Editor</b> .
clogHistMsgText	1.3.6.1.4.1.9.9.41 .1.2.3.1.5	The text of the message.
clogHistTimestamp	1.3.6.1.4.1.9.9.41 .1.2.3.1.6	The value of sysUpTime when this message was generated.

# CISCO-EPM-NOTIFICATION-MIB :: ciscoEpmNotificationAlarmRev1

The CISCO-EPM-NOTIFICATION-MIB :: ciscoEpmNotificationAlarm supports new/updating/deleting events. This trap type is preferred for MWTM 6.1/Northbound OSS integration.

[Table 7-2](#) describes the Notification attributes.

**Table 7-2 Notification Attributes**

Attribute Name	OID	Value
cenAlarmVersion	1.3.6.1.4.1.9.9.31 1.1.1.2.1.2	Unused
cenAlarmTimestamp	1.3.6.1.4.1.9.9.31 1.1.1.2.1.3	Unused. See <a href="#">cenUserMessage2</a> .
cenAlarmUpdatedTimestamp	1.3.6.1.4.1.9.9.31 1.1.1.2.1.4	Unused. See <a href="#">cenUserMessage3</a> .
cenAlarmInstanceID	1.3.6.1.4.1.9.9.31 1.1.1.2.1.5	Unique event ID
cenAlarmStatus	1.3.6.1.4.1.9.9.31 1.1.1.2.1.6	0, 1, or 2 Corresponds to New, Update, or Delete
cenAlarmStatusDefinition	1.3.6.1.4.1.9.9.31 1.1.1.2.1.7	0, 1, or 2 Corresponds to New, Update, or Delete
cenAlarmType	1.3.6.1.4.1.9.9.31 1.1.1.2.1.8	Unused [always unknown(1)]
cenAlarmCategory	1.3.6.1.4.1.9.9.31 1.1.1.2.1.9	Integer corresponding to user defined event category.
cenAlarmCategoryDefinition	1.3.6.1.4.1.9.9.31 1.1.1.2.1.10	String representation of user defined event category.
cenAlarmServerAddressType	1.3.6.1.4.1.9.9.31 1.1.1.2.1.11	Always ipv4
cenAlarmServerAddress	1.3.6.1.4.1.9.9.31 1.1.1.2.1.12	MWTM Server IP address.
cenAlarmManagedObjectClass	1.3.6.1.4.1.9.9.31 1.1.1.2.1.13	The classification of the modeled NE. For example, MWR Node, ITP Node, ONS Node, SP, Linkset, Link, AS, ASPA, SGMP, and Interface.
cenAlarmManagedObjectAddress Type	1.3.6.1.4.1.9.9.31 1.1.1.2.1.14	Always ipv4.
cenAlarmManagedObjectAddress	1.3.6.1.4.1.9.9.31 1.1.1.2.1.15	The IP address of the managed object. Values are either the IP address of the router or the IP address of the MWTM 6.1 server.
cenAlarmDescription	1.3.6.1.4.1.9.9.31 1.1.1.2.1.16	Event message text.

**Table 7-2 Notification Attributes (continued)**

<b>Attribute Name</b>	<b>OID</b>	<b>Value</b>
cenAlarmSeverity	1.3.6.1.4.1.9.9.31 1.1.1.2.1.17	Integer corresponding to user defined event severity.
cenAlarmSeverityDefinition	1.3.6.1.4.1.9.9.31 1.1.1.2.1.18	String representation of user defined event severity.
cenAlarmTriageValue	1.3.6.1.4.1.9.9.31 1.1.1.2.1.19	Unused (Always 0).
cenEventIDList	1.3.6.1.4.1.9.9.31 1.1.1.2.1.20	Unique event ID.
cenUserMessage1	1.3.6.1.4.1.9.9.31 1.1.1.2.1.21	Event name.
cenUserMessage2	1.3.6.1.4.1.9.9.31 1.1.1.2.1.22	UNIX time when event occurred. Example: 2030-04-14, 16:05:05.369,0400
cenUserMessage3	1.3.6.1.4.1.9.9.31 1.1.1.2.1.23	UNIX time when event changed. Example: 2030-04-14, 16:05:05.369,0400
cenAlarmMode	1.3.6.1.4.1.9.9.31 1.1.1.2.1.24	Either 2 for alert or 3 for event.
cenPartitionNumber	1.3.6.1.4.1.9.9.31 1.1.1.2.1.25	Count of the number of times this event or alert has occurred.
cenPartitionName	1.3.6.1.4.1.9.9.31 1.1.1.2.1.26	Correlation key
cenCustomerIdentification	1.3.6.1.4.1.9.9.31 1.1.1.2.1.27	Network element name
cenCustomerRevision	1.3.6.1.4.1.9.9.31 1.1.1.2.1.28	Acknowledged by user name.
cenAlertID	1.3.6.1.4.1.9.9.31 1.1.1.2.1.29	Unique event ID.





# CHAPTER 8

## MWTM 6.1 NBAPI CLI Tools

---

MWTM 6.1 provides utility tools to help you use the Northbound API (NBAPI). The following tools can be invoked from the command line (CLI) or wrapped within the script for Operations Support System (OSS) integration.

MWTM 6.1 provides the following Northbound API CLI commands:

- [mwtm dbtool](#), page 8-1
- [mwtm eventtool](#), page 8-2
- [mwtm inventorytool](#), page 8-4
- [mwtm provisiontool](#), page 8-6

For information about other command line utilities available in MWTM 6.1, see the [User Guide for the Cisco Mobile Wireless Transport Manager 6.1](#).

The MWTM NBAPI also provides support for Hypertext Transfer Protocol over Secure Socket Layer (HTTPS). To set up secure access, see “Implementing SSL Support in the MWTM” in Chapter 2 of the [User Guide for the Cisco Mobile Wireless Transport Manager 6.1](#).

## mwtm dbtool

### Server Only

### Syntax

```
mwtm dbtool {SQL}
```

### Command Description

Issues a SQL query against the MWTM database. Use a standard SQL query, except replace any instances of the asterisk (\*) with a question mark (?). For example, a sample SQL query might be:

```
"select * from events"
```

Using the `mwtm dbtool` command, this SQL query would be:

```
mwtm dbtool "select ? from events"
```



### Note

---

You must log in as the root user or superuser to use this command.

---

# mwtm eventtool

## Server Only

### Syntax

**mwtm eventtool** *{-a actionName} {parameters}*

### Command Description

Invokes MWTM event API operations.

These action names (and any corresponding required parameters) can be specified with the **-a** option:

Option	Action Names	Required Parameters
-a	acknowledgeEvents	-l or -L -u -n
	appendNote	-e -n -u
	changeSeverities	-s -l or -L -u -n
	clearEvents	-l or -L -u -n
	deleteEvents	-l or -L -u -n
	getAllEventsAsTraps	-t
	getFilteredEventsAsTraps	-t -f
	getNote	-e
	setNote	-e -n -u

These parameters can be used:

Parameter	Description
-e	Specifies an event ID parameter.
-f	Specifies a file name for EventFilter, which is an XML element defined in MWTM WSDL definitions.
-l	Specifies a file name for EventIDList, which is an XML element defined in MWTM WSDL definitions.
-n	Specifies an event note string.
-s	Specifies an event severity.
-t	Specifies a file name for TrapTarget, which is an XML element defined in MWTM WSDL definitions.
-u	Specifies a user ID for event operation.
-H	Specifies a hostname to connect to. If unspecified, the default value is obtained from the MWTM server <b>System.properties</b> file, SERVER_NAME property.
-p	Specifies a port to connect to. If unspecified, the default value is obtained from the MWTM server <b>System.properties</b> file, WEB_PORT property.
-L	Specifies a list of event IDs, separated by ' '.
-S	Specifies whether to use SSL (https) for NBAPI access. Default is no SSL.
-h	Prints help information.



**Note**

You must log in as the root user or superuser to use this command.

# mwtm inventorytool

## Server Only

### Syntax

**mwtm inventorytool -a** *actionName* [*parameters*]

### Command Description

Invokes inventory API operations.

These action names (and any corresponding required parameters) can be specified with the **-a** option:

Option	Action Names	Parameters
-a	getAllNEs	-c
	getRootNEs	-H
		-p
		-S
		-h
	getNE	-f
	getChildNEs	-c
	getDescendantNEs	-H
	getNote	-p
		-S
	-h	
	setNote	-f
	appendNote	-u
		-n
		-H
		-p
		-S
		-h

You can use these parameters:

Parameter	Description
-c	(Optional) Specifies the context of the inventory. Valid contexts include: <b>config</b> , <b>monitor</b> , and <b>all</b> . If unspecified, the default value is <b>all</b> .
-f	Specifies a fully qualified domain name (FQDN).
-S	(Optional) Specifies whether to use SSL (https) for NAPI access. The default is no SSL.
-n	Specifies a note string. Enclose the string in double quotes.

Parameter	Description
-u	Specifies a user ID for inventory operation.
-H	(Optional) Specifies a hostname to connect to. If unspecified, the system obtains the default value from the MWTM server <b>System.properties</b> file, <b>SERVER_NAME</b> property.
-p	(Optional) Specifies a port to which to connect. If unspecified, the system obtains the default value from the MWTM server <b>System.properties</b> file, <b>WEB_PORT</b> property.
-h	(Optional) Prints help information.

**Note**

You must log in as the root user or superuser to use this command.

# mwtm provisiontool

## Server Only

### Syntax

**mwtm provisiontool -a** *actionName* [*parameters*]

### Command Description

Invokes provisioning API operations.

You can specify these action names (and any corresponding required parameters) by using the **-a** option:

Option	Action Names	Parameters
-a	provision	r -H -p -S -h
	syncFromDevice	-f
	iosWriteToStartup	-H -p -S -h

You can use these parameters:

Parameter	Description
-r	Specifies a file name for <b>ProvisionRequest</b> , which is an XML element from the MWTM WSDL definitions.
-f	Specifies a fully qualified domain name (FQDN).
-H	(Optional) Specifies a hostname to connect to. If unspecified, the system obtains the default value from the MWTM server <b>System.properties</b> file, <b>SERVER_NAME</b> property.
-p	(Optional) Specifies a port to which to connect. If unspecified, the system obtains the default value from the MWTM server <b>System.properties</b> file, <b>WEB_PORT</b> property.
-S	(Optional) Specifies whether to use SSL (https) for NAPI access. The default is no SSL.
-h	(Optional) Print help information.



#### Note

You must log in as the root user or superuser to use this command.



# APPENDIX **A**

## MWTM 6.1 NBAPI WSDL and XSD Definitions

This appendix describes the WSDL and XSD<sup>1</sup> (XML Schema Definition) definitions for MWTM 6.1 Northbound API (NBAPI):

- [InventoryAPI.wsdl](#), page A-1
- [EventAPI.wsdl](#), page A-5
- [ProvisionAPI.wsdl](#), page A-9
- [MWTM.xsd](#), page A-10
- [Common.xsd](#), page A-10
- [Inventory.xsd](#), page A-11
- [Event.xsd](#), page A-12
- [Provision.xsd](#), page A-13



### Note

MWTM 6.1 NBAPI WSDL and XSD definitions can also be obtained at the following locations:

```
${MWTM_INSTALL_BASEDIR}/tomcat/webapp/nbapi/WEB-INF/wsdl/InventoryAPI.wsdl  
${MWTM_INSTALL_BASEDIR}/tomcat/webapp/nbapi/WEB-INF/wsdl/EventAPI.wsdl  
${MWTM_INSTALL_BASEDIR}/tomcat/webapp/nbapi/WEB-INF/wsdl/ProvisionAPI.wsdl  
${MWTM_INSTALL_BASEDIR}/tomcat/webapp/nbapi/WEB-INF/wsdl/MWTM.xsd  
${MWTM_INSTALL_BASEDIR}/tomcat/webapp/nbapi/WEB-INF/wsdl/Common.xsd  
${MWTM_INSTALL_BASEDIR}/tomcat/webapp/nbapi/WEB-INF/wsdl/Inventory.xsd  
${MWTM_INSTALL_BASEDIR}/tomcat/webapp/nbapi/WEB-INF/wsdl/Event.xsd  
${MWTM_INSTALL_BASEDIR}/tomcat/webapp/nbapi/WEB-INF/wsdl/Provision.xsd
```

## InventoryAPI.wsdl

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>  
<definitions targetNamespace="http://cisco.com/mwtm" name="InventoryAPIService"  
  xmlns:tns="http://cisco.com/mwtm"  
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"  
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"  
  xmlns="http://schemas.xmlsoap.org/wsdl/">
```

```
<types>
```

```
<xsd:schema>
```

```
<xsd:import namespace="http://cisco.com/mwtm" schemaLocation="MWTM.xsd" />
```

1. The XML Schema language (see <http://www.w3.org/XML/Schema>).

```

    </xsd:schema>
</types>

<message name="APIStatus">
  <part name="APIStatus" element="tns:APIStatus" />
</message>
<message name="getAllNEsRequest">
  <part name="Type" type="tns:InventoryType" />
</message>
<message name="getAllNEsResponse">
  <part name="NetworkElementList" type="tns:NetworkElementList" />
</message>
<message name="getRootNEsRequest">
  <part name="Type" type="tns:InventoryType" />
</message>
<message name="getRootNEsResponse">
  <part name="NetworkElementList" type="tns:NetworkElementList" />
</message>
<message name="getNERequest">
  <part name="FQDN" type="xsd:string" />
  <part name="Type" type="tns:InventoryType" />
</message>
<message name="getNEResponse">
  <part name="NetworkElement" type="tns:NetworkElement" />
</message>
<message name="getChildNEsRequest">
  <part name="FQDN" type="xsd:string" />
  <part name="Type" type="tns:InventoryType" />
</message>
<message name="getChildNEsResponse">
  <part name="NetworkElementList" type="tns:NetworkElementList" />
</message>
<message name="getDescendantNEsRequest">
  <part name="FQDN" type="xsd:string" />
  <part name="Type" type="tns:InventoryType" />
</message>
<message name="getDescendantNEsResponse">
  <part name="NetworkElementList" type="tns:NetworkElementList" />
</message>
<message name="getNoteRequest">
  <part name="FQDN" type="xsd:string" />
</message>
<message name="getNoteResponse">
  <part name="note" type="xsd:string" />
</message>
<message name="setNoteRequest">
  <part name="FQDN" type="xsd:string" />
  <part name="userid" type="xsd:string" />
  <part name="note" type="xsd:string" />
</message>
<message name="setNoteResponse">
</message>
<message name="appendNoteRequest">
  <part name="FQDN" type="xsd:string" />
  <part name="userid" type="xsd:string" />
  <part name="note" type="xsd:string" />
</message>
<message name="appendNoteResponse">
</message>

<portType name="InventoryAPI">
  <operation name="getAllNEs">
    <input message="tns:getAllNEsRequest" />
    <output message="tns:getAllNEsResponse" />
  </operation>
</portType>

```

```

    <fault name="APIStatus" message="tns:APIStatus" />
</operation>
<operation name="getRootNEs">
  <input message="tns:getRootNEsRequest" />
  <output message="tns:getRootNEsResponse" />
  <fault name="APIStatus" message="tns:APIStatus" />
</operation>
<operation name="getNE">
  <input message="tns:getNERequest" />
  <output message="tns:getNEReponse" />
  <fault name="APIStatus" message="tns:APIStatus" />
</operation>
<operation name="getChildNEs">
  <input message="tns:getChildNEsRequest" />
  <output message="tns:getChildNEsResponse" />
  <fault name="APIStatus" message="tns:APIStatus" />
</operation>
<operation name="getDescendantNEs">
  <input message="tns:getDescendantNEsRequest" />
  <output message="tns:getDescendantNEsResponse" />
  <fault name="APIStatus" message="tns:APIStatus" />
</operation>
<operation name="getNote">
  <input message="tns:getNoteRequest" />
  <output message="tns:getNoteResponse" />
  <fault name="APIStatus" message="tns:APIStatus" />
</operation>
<operation name="setNote">
  <input message="tns:setNoteRequest" />
  <output message="tns:setNoteResponse" />
  <fault name="APIStatus" message="tns:APIStatus" />
</operation>
<operation name="appendNote">
  <input message="tns:appendNoteRequest" />
  <output message="tns:appendNoteResponse" />
  <fault name="APIStatus" message="tns:APIStatus" />
</operation>
</portType>

<binding name="InventoryAPIPortBinding" type="tns:InventoryAPI">
  <soap:binding transport="http://schemas.xmlsoap.org/soap/http" style="rpc" />
  <operation name="getAllNEs">
    <soap:operation soapAction="" />
    <input>
      <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
    </input>
    <output>
      <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
    </output>
    <fault name="APIStatus">
      <soap:fault name="APIStatus" use="literal" />
    </fault>
  </operation>
  <operation name="getRootNEs">
    <soap:operation soapAction="" />
    <input>
      <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
    </input>
    <output>
      <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
    </output>
    <fault name="APIStatus">
      <soap:fault name="APIStatus" use="literal" />
    </fault>
  </operation>

```

```

</operation>
<operation name="getNE">
  <soap:operation soapAction="" />
  <input>
    <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
  </input>
  <output>
    <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
  </output>
  <fault name="APIStatus">
    <soap:fault name="APIStatus" use="literal" />
  </fault>
</operation>
<operation name="getChildNES">
  <soap:operation soapAction="" />
  <input>
    <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
  </input>
  <output>
    <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
  </output>
  <fault name="APIStatus">
    <soap:fault name="APIStatus" use="literal" />
  </fault>
</operation>
<operation name="getDescendantNES">
  <soap:operation soapAction="" />
  <input>
    <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
  </input>
  <output>
    <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
  </output>
  <fault name="APIStatus">
    <soap:fault name="APIStatus" use="literal" />
  </fault>
</operation>
<operation name="getNote">
  <soap:operation soapAction="" />
  <input>
    <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
  </input>
  <output>
    <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
  </output>
  <fault name="APIStatus">
    <soap:fault name="APIStatus" use="literal" />
  </fault>
</operation>
<operation name="setNote">
  <soap:operation soapAction="" />
  <input>
    <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
  </input>
  <output>
    <soap:body use="literal" namespace="http://cisco.com/mwmtm" />
  </output>
  <fault name="APIStatus">
    <soap:fault name="APIStatus" use="literal" />
  </fault>
</operation>
<operation name="appendNote">
  <soap:operation soapAction="" />
  <input>

```

```

        <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </input>
    <output>
        <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </output>
    <fault name="APIStatus">
        <soap:fault name="APIStatus" use="literal"/>
    </fault>
</operation>
</binding>

<service name="InventoryAPIService">
    <port name="InventoryAPIPort" binding="tns:InventoryAPIPortBinding">
        <soap:address location="REPLACE_WITH_ACTUAL_URL"/>
    </port>
</service>

</definitions>

```

## EventAPI.wsdl

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<definitions targetNamespace="http://cisco.com/mwtm" name="EventAPIService"
    xmlns:tns="http://cisco.com/mwtm"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
    xmlns="http://schemas.xmlsoap.org/wsdl/">

    <types>
        <xsd:schema>
            <xsd:import namespace="http://cisco.com/mwtm" schemaLocation="MWTM.xsd"/>
        </xsd:schema>
    </types>

    <message name="APIStatus">
        <part name="APIStatus" element="tns:APIStatus"/>
    </message>
    <message name="getAllEventsAsTrapsRequest">
        <part name="target" type="tns:TrapTarget"/>
    </message>
    <message name="getAllEventsAsTrapsResponse">
        <part name="eventCount" type="xsd:int"/>
    </message>
    <message name="getFilteredEventsAsTrapsRequest">
        <part name="target" type="tns:TrapTarget"/>
        <part name="filter" type="tns:EventFilter"/>
    </message>
    <message name="getFilteredEventsAsTrapsResponse">
        <part name="eventCount" type="xsd:int"/>
    </message>
    <message name="clearEventsRequest">
        <part name="eventList" type="tns:EventIDList"/>
        <part name="userid" type="xsd:string"/>
        <part name="note" type="xsd:string"/>
    </message>
    <message name="clearEventsResponse">
    </message>
    <message name="acknowledgeEventsRequest">
        <part name="eventList" type="tns:EventIDList"/>
        <part name="userid" type="xsd:string"/>
        <part name="note" type="xsd:string"/>
    </message>

```

```

</message>
<message name="acknowledgeEventsResponse">
</message>
<message name="deleteEventsRequest">
  <part name="eventList" type="tns:EventIDList"/>
</message>
<message name="deleteEventsResponse">
</message>
<message name="changeSeveritiesRequest">
  <part name="eventList" type="tns:EventIDList"/>
  <part name="severity" type="xsd:string"/>
  <part name="userid" type="xsd:string"/>
  <part name="note" type="xsd:string"/>
</message>
<message name="changeSeveritiesResponse">
</message>
<message name="getNoteRequest">
  <part name="eventID" type="xsd:long"/>
</message>
<message name="getNoteResponse">
  <part name="note" type="xsd:string"/>
</message>
<message name="setNoteRequest">
  <part name="eventID" type="xsd:long"/>
  <part name="userid" type="xsd:string"/>
  <part name="note" type="xsd:string"/>
</message>
<message name="setNoteResponse">
</message>
<message name="appendNoteRequest">
  <part name="eventID" type="xsd:long"/>
  <part name="userid" type="xsd:string"/>
  <part name="note" type="xsd:string"/>
</message>
<message name="appendNoteResponse">
</message>

<portType name="EventAPI">
  <operation name="getAllEventsAsTraps">
    <input message="tns:getAllEventsAsTrapsRequest"/>
    <output message="tns:getAllEventsAsTrapsResponse"/>
    <fault name="APIStatus" message="tns:APIStatus"/>
  </operation>
  <operation name="getFilteredEventsAsTraps">
    <input message="tns:getFilteredEventsAsTrapsRequest"/>
    <output message="tns:getFilteredEventsAsTrapsResponse"/>
    <fault name="APIStatus" message="tns:APIStatus"/>
  </operation>
  <operation name="clearEvents">
    <input message="tns:clearEventsRequest"/>
    <output message="tns:clearEventsResponse"/>
    <fault name="APIStatus" message="tns:APIStatus"/>
  </operation>
  <operation name="acknowledgeEvents">
    <input message="tns:acknowledgeEventsRequest"/>
    <output message="tns:acknowledgeEventsResponse"/>
    <fault name="APIStatus" message="tns:APIStatus"/>
  </operation>
  <operation name="deleteEvents">
    <input message="tns:deleteEventsRequest"/>
    <output message="tns:deleteEventsResponse"/>
    <fault name="APIStatus" message="tns:APIStatus"/>
  </operation>
  <operation name="changeSeverities">

```

```

        <input message="tns:changeSeveritiesRequest" />
        <output message="tns:changeSeveritiesResponse" />
        <fault name="APIStatus" message="tns:APIStatus" />
    </operation>
    <operation name="getNote">
        <input message="tns:getNoteRequest" />
        <output message="tns:getNoteResponse" />
        <fault name="APIStatus" message="tns:APIStatus" />
    </operation>
    <operation name="setNote">
        <input message="tns:setNoteRequest" />
        <output message="tns:setNoteResponse" />
        <fault name="APIStatus" message="tns:APIStatus" />
    </operation>
    <operation name="appendNote">
        <input message="tns:appendNoteRequest" />
        <output message="tns:appendNoteResponse" />
        <fault name="APIStatus" message="tns:APIStatus" />
    </operation>
</portType>

<binding name="EventAPIPortBinding" type="tns:EventAPI">
    <soap:binding transport="http://schemas.xmlsoap.org/soap/http" style="rpc" />
    <operation name="getAllEventsAsTraps">
        <soap:operation soapAction="" />
        <input>
            <soap:body use="literal" namespace="http://cisco.com/mwtm" />
        </input>
        <output>
            <soap:body use="literal" namespace="http://cisco.com/mwtm" />
        </output>
        <fault name="APIStatus">
            <soap:fault name="APIStatus" use="literal" />
        </fault>
    </operation>
    <operation name="getFilteredEventsAsTraps">
        <soap:operation soapAction="" />
        <input>
            <soap:body use="literal" namespace="http://cisco.com/mwtm" />
        </input>
        <output>
            <soap:body use="literal" namespace="http://cisco.com/mwtm" />
        </output>
        <fault name="APIStatus">
            <soap:fault name="APIStatus" use="literal" />
        </fault>
    </operation>
    <operation name="clearEvents">
        <soap:operation soapAction="" />
        <input>
            <soap:body use="literal" namespace="http://cisco.com/mwtm" />
        </input>
        <output>
            <soap:body use="literal" namespace="http://cisco.com/mwtm" />
        </output>
        <fault name="APIStatus">
            <soap:fault name="APIStatus" use="literal" />
        </fault>
    </operation>
    <operation name="acknowledgeEvents">
        <soap:operation soapAction="" />
        <input>
            <soap:body use="literal" namespace="http://cisco.com/mwtm" />
        </input>
    </operation>

```

```

    <output>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </output>
    <fault name="APIStatus">
      <soap:fault name="APIStatus" use="literal"/>
    </fault>
  </operation>
  <operation name="deleteEvents">
    <soap:operation soapAction="" />
    <input>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </input>
    <output>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </output>
    <fault name="APIStatus">
      <soap:fault name="APIStatus" use="literal"/>
    </fault>
  </operation>
  <operation name="changeSeverities">
    <soap:operation soapAction="" />
    <input>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </input>
    <output>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </output>
    <fault name="APIStatus">
      <soap:fault name="APIStatus" use="literal"/>
    </fault>
  </operation>
  <operation name="getNote">
    <soap:operation soapAction="" />
    <input>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </input>
    <output>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </output>
    <fault name="APIStatus">
      <soap:fault name="APIStatus" use="literal"/>
    </fault>
  </operation>
  <operation name="setNote">
    <soap:operation soapAction="" />
    <input>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </input>
    <output>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </output>
    <fault name="APIStatus">
      <soap:fault name="APIStatus" use="literal"/>
    </fault>
  </operation>
  <operation name="appendNote">
    <soap:operation soapAction="" />
    <input>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </input>
    <output>
      <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
    </output>
    <fault name="APIStatus">

```

```

        <soap:fault name="APIStatus" use="literal"/>
    </fault>
</operation>
</binding>

<service name="EventAPIService">
    <port name="EventAPIPort" binding="tns:EventAPIPortBinding">
        <soap:address location="REPLACE_WITH_ACTUAL_URL"/>
    </port>
</service>

</definitions>

```

## ProvisionAPI.wsdl

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<definitions targetNamespace="http://cisco.com/mwtm" name="ProvisionAPIService"
    xmlns:tns="http://cisco.com/mwtm"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
    xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
    xmlns="http://schemas.xmlsoap.org/wsdl/">

    <types>
        <xsd:schema>
            <xsd:import namespace="http://cisco.com/mwtm" schemaLocation="MWTM.xsd"/>
        </xsd:schema>
    </types>

    <message name="APIStatus">
        <part name="APIStatus" element="tns:APIStatus"/>
    </message>
    <message name="provisionRequest">
        <part name="Request" type="tns:ProvisionRequest"/>
    </message>
    <message name="provisionResponse">
    </message>

    <portType name="ProvisionAPI">
        <operation name="provision">
            <input message="tns:provisionRequest"/>
            <output message="tns:provisionResponse"/>
            <fault name="APIStatus" message="tns:APIStatus"/>
        </operation>
    </portType>

    <binding name="ProvisionAPIPortBinding" type="tns:ProvisionAPI">
        <soap:binding transport="http://schemas.xmlsoap.org/soap/http" style="rpc"/>
        <operation name="provision">
            <soap:operation soapAction=""/>
            <input>
                <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
            </input>
            <output>
                <soap:body use="literal" namespace="http://cisco.com/mwtm"/>
            </output>
            <fault name="APIStatus">
                <soap:fault name="APIStatus" use="literal"/>
            </fault>
        </operation>
    </binding>

```

```

<service name="ProvisionAPIService">
  <port name="ProvisionAPIPort" binding="tns:ProvisionAPIPortBinding">
    <soap:address location="REPLACE_WITH_ACTUAL_URL" />
  </port>
</service>

</definitions>

```

## MWTM.xsd

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<xs:schema version="1.0"
  targetNamespace="http://cisco.com/mwtm"
  xmlns:tns="http://cisco.com/mwtm"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <xs:include schemaLocation="Common.xsd" />

  <xs:include schemaLocation="Event.xsd" />

  <xs:include schemaLocation="Inventory.xsd" />

  <xs:include schemaLocation="Provision.xsd" />

</xs:schema>

```

## Common.xsd

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<xs:schema version="1.0"
  targetNamespace="http://cisco.com/mwtm"
  xmlns:tns="http://cisco.com/mwtm"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <!-- APIStatus contains StatusCode and Message when error occurs -->
  <xs:complexType name="APIStatus">
    <xs:sequence>
      <xs:element name="StatusCode" type="xs:int" />
      <xs:element name="Message" type="xs:string" />
    </xs:sequence>
  </xs:complexType>

  <xs:element name="APIStatus" type="tns:APIStatus" />

  <!-- inventory attribute types: Config, Monitor and All -->
  <xs:simpleType name="InventoryType">
    <xs:restriction base="xs:string">
      <xs:enumeration value="config" />
      <xs:enumeration value="monitor" />
      <xs:enumeration value="all" />
    </xs:restriction>
  </xs:simpleType>

  <!-- provisioning operation types: Add, Modify, Delete -->
  <xs:simpleType name="OperationType">
    <xs:restriction base="xs:string">

```

```

        <xs:enumeration value="add" />
        <xs:enumeration value="modify" />
        <xs:enumeration value="delete" />
    </xs:restriction>
</xs:simpleType>

</xs:schema>

```

## Inventory.xsd

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<xs:schema version="1.0"
    targetNamespace="http://cisco.com/mwtm"
    xmlns:tns="http://cisco.com/mwtm"
    xmlns:xs="http://www.w3.org/2001/XMLSchema">

    <!-- Attribute is a name/value pair -->
    <xs:complexType name="Attribute">
        <xs:simpleContent>
            <xs:extension base="xs:string">
                <xs:attribute name="name" type="xs:string" use="required" />
            </xs:extension>
        </xs:simpleContent>
    </xs:complexType>

    <!-- AttributeGroup is a heterogeneous grouping of attributes -->
    <xs:complexType name="AttributeGroup">
        <xs:complexContent>
            <xs:extension base="tns:AttributeList">
                <xs:attribute name="name" type="xs:string" use="required" />
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>

    <!-- AttributeList is the base type for NetworkElement,
        AttributeGroup and Feature. It contains element for Attribute,
        and/or AttributeGroup -->
    <xs:complexType name="AttributeList">
        <xs:sequence>
            <xs:choice minOccurs="0" maxOccurs="unbounded">
                <xs:element name="Attribute" type="tns:Attribute" />
                <xs:element name="AttributeGroup" type="tns:AttributeGroup" />
            </xs:choice>
        </xs:sequence>
    </xs:complexType>

    <!-- Feature is a AttributeList with a feature name -->
    <!-- A Feature can optionally have a operation type for provisioning -->
    <xs:complexType name="Feature">
        <xs:complexContent>
            <xs:extension base="tns:AttributeGroup">
            </xs:extension>
        </xs:complexContent>
    </xs:complexType>

    <xs:element name="Feature" type="tns:Feature" />

    <!-- NetworkElement is an AttributeList with a list of Features -->
    <!-- NetworkElement has type/subtype and FQDN for object identifier -->
    <xs:complexType name="NetworkElement">

```

```

<xs:complexContent>
  <xs:extension base="tns:AttributeList">
    <xs:sequence>
      <xs:element name="Feature" type="tns:Feature"
        minOccurs="0" maxOccurs="unbounded"/>
    </xs:sequence>
    <xs:attribute name="ParentFQDN" type="xs:string" use="required"/>
    <xs:attribute name="type" type="xs:string" use="required"/>
    <xs:attribute name="subtype" type="xs:string"/>
  </xs:extension>
</xs:complexContent>
</xs:complexType>

<xs:element name="NetworkElement" type="tns:NetworkElement"/>

<!-- NetworkElementList is a List of NetworkElement -->
<xs:complexType name="NetworkElementList">
  <xs:sequence>
    <xs:element name="NetworkElement" type="tns:NetworkElement"
      minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<xs:element name="NetworkElementList" type="tns:NetworkElementList"/>

</xs:schema>

```

## Event.xsd

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<xs:schema version="1.0"
  targetNamespace="http://cisco.com/mwtm"
  xmlns:tns="http://cisco.com/mwtm"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <!-- A list of event IDs -->
  <xs:complexType name="EventIDList">
    <xs:sequence>
      <xs:element name="ID" type="xs:long" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>

  <xs:element name="EventIDList" type="tns:EventIDList"/>

  <!-- Trap Target specifies target host/port and SNMP parameters to send
  SNMP Trap notification to -->
  <xs:complexType name="TrapTarget">
    <xs:sequence>
      <xs:element name="Hostname" type="xs:string"/>
      <xs:element name="Port" type="xs:int"/>
      <xs:element name="Community" type="xs:string"/>
      <xs:element name="SNMPVersion">
        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:enumeration value="1"/>
            <xs:enumeration value="2c"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
      <xs:element name="MIB">

```

```

        <xs:simpleType>
          <xs:restriction base="xs:string">
            <xs:enumeration value="CISCO-EPM"/>
            <xs:enumeration value="CISCO-SYSLOG"/>
          </xs:restriction>
        </xs:simpleType>
      </xs:element>
    </xs:sequence>
  </xs:complexType>

  <xs:element name="TrapTarget" type="tns:TrapTarget"/>

  <!-- Event Filter -->
  <!-- If more than one conditions are specified,
        EventFilter applies "AND" on all specified conditions
  -->
  <xs:complexType name="EventFilter">
    <xs:sequence>
      <xs:element name="EventIDs" type="tns:EventIDList" minOccurs="0"/>
      <xs:element name="StartDate" type="xs:dateTime" minOccurs="0"/>
      <xs:element name="EndDate" type="xs:dateTime" minOccurs="0"/>
      <xs:element name="Severity" type="xs:string"
        minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="Category" type="xs:string"
        minOccurs="0" maxOccurs="unbounded"/>
      <xs:element name="Acknowledged" type="xs:boolean" minOccurs="0"/>
      <xs:element name="Cleared" type="xs:boolean" minOccurs="0"/>
      <!-- filter "text" is based on whether event message contains
            given text -->
      <xs:element name="MessageText" type="xs:string" minOccurs="0"/>
      <xs:element name="NetworkElement" type="xs:string" minOccurs="0"/>
      <xs:element name="Forward" type="xs:boolean" minOccurs="0"/>
    </xs:sequence>
  </xs:complexType>

  <xs:element name="EventFilter" type="tns:EventFilter"/>
</xs:schema>

```

## Provision.xsd

```

<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<xs:schema version="1.0"
  targetNamespace="http://cisco.com/mwtm"
  xmlns:tns="http://cisco.com/mwtm"
  xmlns:xs="http://www.w3.org/2001/XMLSchema">

  <!-- a ProvisionOperation is an operation on NetworkElement -->
  <xs:complexType name="ProvisionOperation">
    <xs:complexContent>
      <xs:extension base="tns:NetworkElement">
        <xs:attribute name="operation" type="tns:OperationType" use="required"/>
        <xs:attribute name="iosWriteToStartup" type="xs:boolean" default="false"/>
      </xs:extension>
    </xs:complexContent>
  </xs:complexType>

  <xs:element name="ProvisionOperation" type="tns:ProvisionOperation"/>

  <xs:complexType name="IOSWriteToStartup">

```

```

    <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute name="FQDN" type="xs:string" />
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>

  <xs:complexType name="SyncFromDevice">
    <xs:simpleContent>
      <xs:extension base="xs:string">
        <xs:attribute name="FQDN" type="xs:string" />
      </xs:extension>
    </xs:simpleContent>
  </xs:complexType>

  <!-- A ProvisionRequest contains a list of ProvisionOperation -->
  <xs:complexType name="ProvisionRequest">
    <xs:sequence>
      <xs:choice minOccurs="0" maxOccurs="unbounded">
        <xs:element name="ProvisionOperation" type="tns:ProvisionOperation" />
        <xs:element name="IOSWriteToStartup" type="tns:IOSWriteToStartup" />
        <xs:element name="SyncFromDevice" type="tns:SyncFromDevice" />
      </xs:choice>
    </xs:sequence>
  </xs:complexType>

  <xs:element name="ProvisionRequest" type="tns:ProvisionRequest" />
</xs:schema>

```



# APPENDIX **B**

## MWTM 6.1 NBAPI Error Codes

This appendix describes the MWTM 6.1 Inventory API fault messages and error codes.

Detailed error information is defined as APIStatus in WSDL (for definitions, see [Appendix A, “MWTM 6.1 NBAPI WSDL and XSD Definitions”](#)):

```
<xs:complexType name="APIStatus">
  <xs:sequence>
    <xs:element name="StatusCode" type="xs:int"/>
    <xs:element name="Message" type="xs:string"/>
  </xs:sequence>
</xs:complexType>
```

An APIStatus object contains an integer StatusCode and a string Message. [Table B-1](#) lists the possible status codes generated by the MWTM 6.1.

**Table B-1**      **Status Codes**

Status Code	Error	Description
1000	UNEXPECTED_ERROR	An unexpected error has occurred that prevents the fulfilling of the requested operation.
2000	INVALID_PARAMETER	Requester provided one or more invalid parameters in the requested operation.
2001	INVALID_PARAMETER_FQDN_FORMAT	The FQDN format is incorrect.
2002	INVALID_PARAMETER_FQDN_NOT_EXIST	The FQDN does not exist.
2003	INVALID_PARAMETER_FQDN_ALREADY_EXIST	The FQDN already exists.
2004	INVALID_PARAMETER_PROVISION_VALIDATION_ERROR	Provision request validation error occurred. A detailed message is provided on which attributes have errors.
3000	SERVER_ERROR	The MWTM 6.1 Server encountered an error that has caused the failure of the requested operation.
3001	SERVER_ERROR_PROFILE_NOT_EXIST	Profile does not exist for the requested operation.
3002	SERVER_ERROR_FEATURE_NOT_EXIST	Feature does not exist for requested operation.
3003	SERVER_ERROR_TEMPLATE_NOT_EXIST	Template does not exist for requested operation.

Table B-1 Status Codes (continued)

Status Code	Error	Description
3004	SERVER_ERROR_TEMPLATE_ERROR	Error occurred when processing template.
3005	SERVER_ERROR_WRITE_CONFIGLET_ERROR	Error occurred when writing configlet to file.
3006	SERVER_ERROR_UNABLE_TO_LOCK_NODE	<p>Error occurred when the MWTM 6.1 server is unable to lock the node for provisioning operation.</p> <p>The MWTM 6.1 allows one request at a time to provision a given node. If the MWTM 6.1 receives multiple requests to provision the same node at the same time, then one of the requests will get the lock, all other requests will receive this error code that node locking has failed.</p>
4000	DEVICE_ERROR	An error occurred on the device that caused the failure of the requested operation.



# APPENDIX C

## CISCO-SYSLOG-MIB

---

This appendix contains the CISCO-SYSLOG-MIB.



**Note**

The MWTM 6.1 Event API WSDL definition might be found at any of the following locations:

{MWTM\_INSTALL\_BASEDIR}/apache/htdocs/mibs/CISCO-SYSLOG-MIB.my

<ftp://ftp.cisco.com/pub/mibs/v2/CISCO-SYSLOG-MIB.my>

---

```
-- *****
-- CISCO-SYSLOG-MIB.my: Cisco syslog message MIB file
--
-- August 1995, Scott Mordock
--
-- Copyright (c) 1995-1997, 2005 by cisco Systems, Inc.
-- All rights reserved.
-- *****
--
-- This MIB provides a means to gather syslog messages generated
-- by the Cisco IOS
--
-- Terminology:
-- Various textual messages are generated by the Cisco IOS. The IOS
-- can be configured such that these messages are sent to a "syslog"
-- server. With this MIB these same messages can also be received via
-- the SNMP. These messages are hereupon referred to as "syslog
-- messages" in this document. Note: Messages generated as a result
-- of entering CLI debug commands are not made available via the SNMP
-- at this time.
--
-- All IOS syslog messages have the following attributes:
--     timestamp (optional), facility name (where the message came
--     from), severity, message name, message text
--
-- The following example is often seen:
--     %SYS-5-CONFIG_I: Configured from console ...
-- where facility=SYS, severity=5, message name=CONFIG_I

CISCO-SYSLOG-MIB DEFINITIONS ::= BEGIN

IMPORTS
    MODULE-IDENTITY,
    NOTIFICATION-TYPE,
    OBJECT-TYPE,
```

```

Integer32,
Counter32,
Unsigned32
    FROM SNMPv2-SMI
TEXTUAL-CONVENTION,
DisplayString,
TimeStamp,
TruthValue,
RowStatus
    FROM SNMPv2-TC
MODULE-COMPLIANCE,
OBJECT-GROUP,
NOTIFICATION-GROUP
    FROM SNMPv2-CONF
SnmpAdminString
    FROM SNMP-FRAMEWORK-MIB
ciscoMgmt
    FROM CISCO-SMI
InetAddress,
InetAddressType
    FROM INET-ADDRESS-MIB;

ciscoSyslogMIB MODULE-IDENTITY
    LAST-UPDATED          "200512030000Z"
    ORGANIZATION          "Cisco Systems, Inc."
    CONTACT-INFO
        "                  Cisco Systems
                  Customer Service

        Postal: 170 W Tasman Drive
                  San Jose, CA 95134
                  USA

        Tel: +1 800 553-NETS

        E-mail: cs-snmp@cisco.com"
    DESCRIPTION
        "The MIB module to describe and store the system
        messages generated by the IOS and any other
        OS which supports syslogs."
    REVISION               "200512030000Z"
    DESCRIPTION
        "Removed UNITS clause for clogOriginIDType
        as UNITS clause is not applicable."

    REVISION               "200508110000Z"
    DESCRIPTION
        "Added following objects:
        clogOriginIDType
        clogOriginID"

    REVISION               "200506010000Z"
    DESCRIPTION
        "Added clogServerGroup."
    REVISION               "9508070000Z"
    DESCRIPTION
        "Initial version of this MIB module."
    ::= { ciscoMgmt 41 }

ciscoSyslogMIBObjects OBJECT IDENTIFIER ::= { ciscoSyslogMIB 1 }

-- Subgroups

clogBasic                OBJECT IDENTIFIER ::= { ciscoSyslogMIBObjects 1 }

```

```

clogHistory      OBJECT IDENTIFIER ::= { ciscoSyslogMIBObjects 2 }
clogServer      OBJECT IDENTIFIER ::= { ciscoSyslogMIBObjects 3 }

-- Textual Conventions

SyslogSeverity ::= TEXTUAL-CONVENTION
    STATUS current
    DESCRIPTION
        "The severity of a syslog message.  The enumeration
        values are equal to the values that syslog uses + 1.
        For example, with syslog, emergency=0.

        'emergency' : system is unusable
        'alert'      : action must be taken immediately
        'critical'   : critical conditions
        'error'      : error conditions
        'warning'    : warning conditions
        'notice'     : normal but significant condition
        'informational': informational messages
        'debug'      : debug-level messages."
    REFERENCE
        "RFC 3164, Section 4.1 - syslog Message Parts"
    SYNTAX INTEGER {
        emergency(1),
        alert(2),
        critical(3),
        error(4),
        warning(5),
        notice(6),
        info(7),
        debug(8)
    }

-- Basic syslog objects

clogNotificationsSent OBJECT-TYPE
    SYNTAX Counter32
    UNITS "notifications"
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "The number of clogMessageGenerated notifications that
        have been sent.  This number may include notifications
        that were prevented from being transmitted due to
        reasons such as resource limitations and/or
        non-connectivity.  If one is receiving notifications,
        one can periodically poll this object to determine if
        any notifications were missed.  If so, a poll of the
        clogHistoryTable might be appropriate."
    ::= { clogBasic 1 }

clogNotificationsEnabled OBJECT-TYPE
    SYNTAX TruthValue
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        "Indicates whether clogMessageGenerated notifications
        will or will not be sent when a syslog message is
        generated by the device.  Disabling notifications
        does not prevent syslog messages from being added
        to the clogHistoryTable."
    DEFVAL { false }
    ::= { clogBasic 2 }

clogMaxSeverity OBJECT-TYPE

```

```

SYNTAX      SyslogSeverity
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "Indicates which syslog severity levels will be
    processed. Any syslog message with a severity value
    greater than this value will be ignored by the agent.
    note: severity numeric values increase as their
    severity decreases, e.g. 'error' is more severe than
    'debug'."
DEFVAL { warning }
 ::= { clogBasic 3 }

clogMsgIgnores OBJECT-TYPE
SYNTAX      Counter32
UNITS       "messages"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of syslog messages which were ignored. A
    message will be ignored if it has a severity value
    greater than clogMaxSeverity."
 ::= { clogBasic 4 }

clogMsgDrops OBJECT-TYPE
SYNTAX      Counter32
UNITS       "messages"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of syslog messages which could not be
    processed due to lack of system resources. Most
    likely this will occur at the same time that syslog
    messages are generated to indicate this lack of
    resources. Increases in this object's value may serve
    as an indication that system resource levels should be
    examined via other mib objects. A message that is
    dropped will not appear in the history table and
    no notification will be sent for this message."
 ::= { clogBasic 5 }

clogOriginIDType OBJECT-TYPE
SYNTAX      INTEGER {
                none          (1),
                other         (2),
                hostName      (3),
                ipv4Address    (4),
                contextName    (5),
                userDefined    (6)
            }
MAX-ACCESS  read-write
STATUS      current
DESCRIPTION
    "This object identifies the type of value that
    will be contained in clogOriginID object.

    The possible value(s) are:
    'none'       : do not send origin identifier in
                  syslog messages.
    'other'      : type that is not identified by other
                  values specified in this object.
    'hostName'   : Send hostname of the system in syslog
                  messages.
    'ipv4Address': Send IP address of the sending interface.

```

```
'contextName': Send context name of the security device.
'userDefined': Send user configured string in
                syslog message.
```

```
The value 'other' and 'none' can not be set but
can only be read."
```

```
DEFVAL { none }
::= { clogBasic 6 }
```

```
clogOriginID OBJECT-TYPE
```

```
SYNTAX      SnmpAdminString
```

```
MAX-ACCESS read-write
```

```
STATUS      current
```

```
DESCRIPTION
```

```
"This object is used for configuring the
origin identifier for the syslog messages.
```

```
The origin identifier is useful for identifying
the source of system logging messages in cases
syslog messages from multiple devices are sent
to a single syslog host.
The origin identifier is added to the beginning of
all system logging (syslog) messages sent to remote
hosts.
```

```
The type of the identifier is specified
by clogOriginIDType object.
```

```
This object can be written by the SNMP manager
only when clogOriginIDType is set to 'userDefined'.
```

```
For following value(s) of clogOriginIDType,
this object can not be set; the value of this
object is derived by the system in these cases:
```

```
'contextName'
'ipv4Address'
'hostName'
'other'
'none'
```

```
This object contains the context name
of the device, when clogOriginIDType is
set to 'contextName'.
```

```
This object contains IPv4 address
(in dotted decimal notation) of the sending
interface when clogOriginIDType is set to
'ipv4Address'.
```

```
This object contains hostname of the system
when clogOriginIDType is set to 'hostName'.
```

```
This object will contain zero length
octet string when clogOriginIDType is
either 'none' or 'other'."
```

```
DEFVAL { "" }
::= { clogBasic 7 }
```

```
-- Syslog message history table
```

```
clogHistTableMaxLength OBJECT-TYPE
```

```
SYNTAX      Integer32 (0..500)
```

```
UNITS      "entries"
```

```
MAX-ACCESS read-write
```

```

STATUS      current
DESCRIPTION
    "The upper limit on the number of entries that the
    clogHistoryTable may contain.  A value of 0 will
    prevent any history from being retained.  When this
    table is full, the oldest entry will be deleted and
    a new one will be created."
DEFVAL      { 1 }
 ::= { clogHistory 1 }

clogHistMsgsFlushed OBJECT-TYPE
SYNTAX      Counter32
UNITS       "messages"
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "The number of entries that have been removed from
    the clogHistoryTable in order to make room for new
    entries.  This object can be utilized to determine
    whether your polling frequency on the history table
    is fast enough and/or the size of your history table
    is large enough such that you are not missing
    messages."
 ::= { clogHistory 2 }

clogHistoryTable OBJECT-TYPE
SYNTAX      SEQUENCE OF ClogHistoryEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A table of syslog messages generated by this device.
    All 'interesting' syslog messages (i.e. severity <=
    clogMaxSeverity) are entered into this table."
 ::= { clogHistory 3 }

clogHistoryEntry OBJECT-TYPE
SYNTAX      ClogHistoryEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A syslog message that was previously generated by this
    device.  Each entry is indexed by a message index."
INDEX       { clogHistIndex }
 ::= { clogHistoryTable 1 }

ClogHistoryEntry ::=
SEQUENCE {
    clogHistIndex      Integer32,
    clogHistFacility   DisplayString,
    clogHistSeverity   SyslogSeverity,
    clogHistMsgName    DisplayString,
    clogHistMsgText    DisplayString,
    clogHistTimestamp  TimeStamp
}

clogHistIndex OBJECT-TYPE
SYNTAX      Integer32 (1..2147483647)
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "A monotonically increasing integer for the sole
    purpose of indexing messages.  When it reaches the
    maximum value the agent flushes the table and wraps
    the value back to 1."

```

```

 ::= { clogHistoryEntry 1 }

clogHistFacility OBJECT-TYPE
    SYNTAX      DisplayString (SIZE (1..20))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "Name of the facility that generated this message.
         For example: 'SYS'."
 ::= { clogHistoryEntry 2 }

clogHistSeverity OBJECT-TYPE
    SYNTAX      SyslogSeverity
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The severity of the message."
 ::= { clogHistoryEntry 3 }

clogHistMsgName OBJECT-TYPE
    SYNTAX      DisplayString (SIZE (1..30))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "A textual identification for the message type.
         A facility name in conjunction with a message name
         uniquely identifies a message type."
 ::= { clogHistoryEntry 4 }

clogHistMsgText OBJECT-TYPE
    SYNTAX      DisplayString (SIZE (1..255))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The text of the message. If the text of the message
         exceeds 255 bytes, the message will be truncated to
         254 bytes and a '*' character will be appended -
         indicating that the message has been truncated."
 ::= { clogHistoryEntry 5 }

clogHistTimestamp OBJECT-TYPE
    SYNTAX      TimeStamp
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The value of sysUpTime when this message was
         generated."
 ::= { clogHistoryEntry 6 }

clogMaxServers OBJECT-TYPE
    SYNTAX      Unsigned32
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "The maximum number of syslog servers that can be
         configured for the system in clogServerConfigTable.

         A value of zero for this object indicates there is
         no specified limit for the system and is only dictated
         by system resources."
 ::= { clogServer 1 }

clogServerConfigTable OBJECT-TYPE

```

```

SYNTAX      SEQUENCE OF ClogServerConfigEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This table contains entries that allow application
    to configure syslog servers for the system.

    The maximum number of entries that can be created
    for this table is limited by the object
    clogMaxServers."
 ::= { clogServer 2 }

clogServerConfigEntry OBJECT-TYPE
    SYNTAX      ClogServerConfigEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "An entry containing information about syslog servers
        configured for the system."
    INDEX       { clogServerAddrType,
                  clogServerAddr }
    ::= { clogServerConfigTable 1 }

ClogServerConfigEntry ::=
    SEQUENCE {
        clogServerAddrType  InetAddressType,
        clogServerAddr      InetAddress,
        clogServerStatus    RowStatus
    }

clogServerAddrType OBJECT-TYPE
    SYNTAX      InetAddressType
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The type of Internet address of this syslog server."
    ::= { clogServerConfigEntry 1 }

clogServerAddr OBJECT-TYPE
    SYNTAX      InetAddress (SIZE(0..64))
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The Internet address of this syslog server.
        The type of this address is determined by the
        value of the clogServerAddrType object."
    ::= { clogServerConfigEntry 2 }

clogServerStatus OBJECT-TYPE
    SYNTAX      RowStatus
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
        "The status object used to manage rows in this table.

        A row may only be created by setting this object to
        'createAndGo'.

        A row may only be deleted by setting this object to
        'destroy'."
    ::= { clogServerConfigEntry 3 }

-- notifications

```

```

ciscoSyslogMIBNotificationPrefix OBJECT IDENTIFIER
                                ::= { ciscoSyslogMIB 2 }
ciscoSyslogMIBNotifications     OBJECT IDENTIFIER
                                ::= { ciscoSyslogMIBNotificationPrefix 0 }

clogMessageGenerated NOTIFICATION-TYPE
  OBJECTS { clogHistFacility,
            clogHistSeverity,
            clogHistMsgName,
            clogHistMsgText,
            clogHistTimestamp
  }
  STATUS      current
  DESCRIPTION
    "When a syslog message is generated by the device a
    clogMessageGenerated notification is sent. The
    sending of these notifications can be enabled/disabled
    via the clogNotificationsEnabled object."
  ::= { ciscoSyslogMIBNotifications 1 }

-- conformance information

ciscoSyslogMIBConformance OBJECT IDENTIFIER ::= { ciscoSyslogMIB 3 }
ciscoSyslogMIBCompliances OBJECT IDENTIFIER
                        ::= { ciscoSyslogMIBConformance 1 }
ciscoSyslogMIBGroups     OBJECT IDENTIFIER
                        ::= { ciscoSyslogMIBConformance 2 }

-- compliance statements

ciscoSyslogMIBCompliance MODULE-COMPLIANCE
  STATUS deprecated -- superceded by ciscoSyslogMIBComplianceRev1
  DESCRIPTION
    "The compliance statement for entities which implement
    the Cisco syslog MIB."
  MODULE -- this module
    MANDATORY-GROUPS { ciscoSyslogMIBGroup }
  ::= { ciscoSyslogMIBCompliances 1 }

ciscoSyslogMIBComplianceRev1 MODULE-COMPLIANCE
  STATUS current
  DESCRIPTION
    "The compliance statement for entities which implement
    the Cisco syslog MIB."
  MODULE -- this module
    MANDATORY-GROUPS { ciscoSyslogMIBGroup }

GROUP clogServerGroup
DESCRIPTION
  "The implementation of this group is
  mandatory for those systems where
  configuration of remote syslog server hosts
  is supported."

GROUP clogOriginIDGroup
DESCRIPTION
  "The implementation of this group is
  mandatory for those systems where
  syslog origin identifier is supported."

GROUP clogNotificationsGroup
DESCRIPTION
  "The implementation of this group is

```

```

        mandatory for those systems where
        syslog notification is supported."
 ::= { ciscoSyslogMIBCompliances 2 }

-- units of conformance

ciscoSyslogMIBGroup OBJECT-GROUP
    OBJECTS { clogNotificationsSent,
              clogNotificationsEnabled,
              clogMaxSeverity,
              clogMsgIgnores,
              clogMsgDrops,
              clogHistTableMaxLength,
              clogHistMsgsFlushed,
              clogHistFacility,
              clogHistSeverity,
              clogHistMsgName,
              clogHistMsgText,
              clogHistTimestamp
    }
    STATUS current
    DESCRIPTION
        "A collection of objects providing the syslog
        MIB capability."
 ::= { ciscoSyslogMIBGroups 1 }

clogNotificationsGroup NOTIFICATION-GROUP
    NOTIFICATIONS {
        clogMessageGenerated
    }
    STATUS current
    DESCRIPTION
        "A collection of notification(s) for syslog feature."
 ::= { ciscoSyslogMIBGroups 2 }

clogServerGroup OBJECT-GROUP
    OBJECTS {
        clogMaxServers,
        clogServerStatus
    }
    STATUS current
    DESCRIPTION
        "A collection of objects providing syslog server
        information for the system."
 ::= { ciscoSyslogMIBGroups 3 }

clogOriginIDGroup OBJECT-GROUP
    OBJECTS {
        clogOriginIDType,
        clogOriginID
    }
    STATUS current
    DESCRIPTION
        "A collection of objects providing information
        on origin of syslog messages."
 ::= { ciscoSyslogMIBGroups 4 }

END

```



# APPENDIX **D**

## CISCO-EPM-NOTIFICATION-MIB

---

This appendix contains the CISCO-EPM-NOTIFICATION-MIB.



**Note**

The CISCO-EPM-NOTIFICATION-MIB might be found at the following locations:

`${MWTM_INSTALL_BASEDIR}/apache/share/htdocs/mibs/CISCO-EP-NOTIFICATION-MIB.my`

<ftp://ftp.cisco.com/pub/mibs/v2/CISCO-EPM-NOTIFICATION-MIB.my>

---

```
-- *****
-- CISCO EPM NOTIFICATION MIB
-- MARCH 2002, Tara Jagannathan, John Ahlstrom
--
-- Copyright (c) 2002, 2003, 2004 by Cisco Systems, Inc.
-- All rights reserved.
-- *****

CISCO-EPM-NOTIFICATION-MIB DEFINITIONS ::= BEGIN

IMPORTS

    MODULE-IDENTITY,
    NOTIFICATION-TYPE,
    Integer32,
    Unsigned32,
    OBJECT-TYPE          FROM SNMPv2-SMI
    MODULE-COMPLIANCE,
    NOTIFICATION-GROUP,
    OBJECT-GROUP         FROM SNMPv2-CONF
    TimeStamp           FROM SNMPv2-TC
    SnmpAdminString     FROM SNMP-FRAMEWORK-MIB
    InetAddressType,
    InetAddress         FROM INET-ADDRESS-MIB
    ciscoMgmt           FROM CISCO-SMI
    ;

ciscoEpmNotificationMIB MODULE-IDENTITY
    LAST-UPDATED "200406070000Z"
    ORGANIZATION "Cisco Systems, Inc."
    CONTACT-INFO "Cisco Systems
                  Customer Service

                  Postal: 170 W Tasman Drive
                  San Jose, CA 95134
```

Tel: +1 800 553-NETS

E-mail: tac@cisco.com"

DESCRIPTION

"Notifications directly from hardware and software and processed notifications from various management applications can be further processed and forwarded by still other management applications to indicate the status of devices and software (managed objects). The status of these managed objects can be reported by traps.

The CISCO-EPM-NOTIFICATION-MIB contains the trap structure which carries the identity and status info of the managed object as analyzed by such an event processor. It is not possible for receivers of these traps to query the mib objects.

A unique but optional feature of the application generating the trap defined in this mib is the ability to contain multiple partitions in the same system running the application. A 'Partition' is a logical grouping of a set of managed devices. These devices can belong to only one partition at any given time. The trap structure will contain information on the exact partition number and the partition name of the device where it resides.

The need for trap generation is to enable multiple management applications in the network to have a consolidated view of the whole network of Cisco and non-Cisco devices."

REVISION "200406070000Z"

DESCRIPTION

"Updated the cenAlarmEntry to include new attributes. The new attributes carries information that adds more value to the already existing trap structure.

The Management application computes events for a device via polling snmp mib objects on the device and/or by listening to SNMP Traps. Multiple events on a single device roll up into what is called an Alert - there can be only one alert for a given device at any given time. The objects contained in the cenAlarmEntry are the same for both Alert and Event based notification. The attribute cenAlarmMode added in this revision of the mib can be used to distinguish between the Alert based and event based notification.

In case of event based notification, the cenAlertID would contain the alert id, as computed by the management system, to which the generated event has been rolled up.

Traps generated from systems that support mutiple Partition, the cenPartitionNumber and cenPartitionName attributes will carry the exact partition details of the device for which the trap is generated.

Through the management application user interface, the user can customize few attributes of the trap structure. Two attributes included in this mib revision that allows the user to customize each trap sent out are cenCustomerIdentification and cenCustomerRevision.

ciscoEpmNotificationObjectsGroup, ciscoEpmNotificationAlarm, and ciscoEpmNotificationMIBCompliance have been deprecated in this revision.

ciscoEpmNotificationAlarmRev1,

```

ciscoEpmNotificationAlarmGroupRev1,
ciscoEpmNotificationMIBComplianceRev1,
and ciscoEpmNotificationObjectsGroupRev1 have been newly created
in this revision."

REVISION      "200308210000Z"
DESCRIPTION
  "Included imports for Integer32, Unsigned32, and
  NOTIFICATION-GROUP."

REVISION      "200207281420Z"
DESCRIPTION
  "Initial version of this MIB."
 ::= { ciscoMgmt 311 }

-- MIB Object Definitions

ciscoEpmNotificationMIBNotifs OBJECT IDENTIFIER
 ::= { ciscoEpmNotificationMIB 0 }
ciscoEpmNotificationMIBObjects OBJECT IDENTIFIER
 ::= { ciscoEpmNotificationMIB 1 }
ciscoEpmNotificationMIBConform OBJECT IDENTIFIER
 ::= { ciscoEpmNotificationMIB 2 }

cenAlarmData          OBJECT IDENTIFIER
 ::= { ciscoEpmNotificationMIBObjects 1 }

cenAlarmTableMaxLength OBJECT-TYPE
    SYNTAX      Unsigned32 ( 1..4294967295 )
    MAX-ACCESS  read-write
    STATUS      current
    DESCRIPTION
      "Maximum number of entries permissible in the cenAlarmTable."
    DEFVAL { 1 }
    ::= { cenAlarmData 1 }

cenAlarmTable          OBJECT-TYPE
    SYNTAX      SEQUENCE OF CenAlarmEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
      "A table containing the device identification and
      alarm value. The maximum number of entries permissible
      in this table is defined by cenAlarmTableMaxLength. When
      the number of entries in the table reaches the maximum
      limit, the next entry would replace the oldest existing
      entry in the table."
    ::= { cenAlarmData 2 }

cenAlarmEntry          OBJECT-TYPE
    SYNTAX      CenAlarmEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
      "The information regarding a single device status alarm.
      An entry is created when an alarm is processed."
    INDEX      { cenAlarmIndex }
    ::= { cenAlarmTable 1 }

CenAlarmEntry ::=
    SEQUENCE {
        cenAlarmIndex          Unsigned32,
        cenAlarmVersion        SnmpAdminString,

```

```

cenAlarmTimestamp                TimeStamp,
cenAlarmUpdatedTimestamp         TimeStamp,
cenAlarmInstanceID              SnmpAdminString,
cenAlarmStatus                  Integer32,
cenAlarmStatusDefinition        SnmpAdminString,
cenAlarmType                    INTEGER,
cenAlarmCategory                Integer32,
cenAlarmCategoryDefinition      SnmpAdminString,
cenAlarmServerAddressType       InetAddressType,
cenAlarmServerAddress           InetAddress,
cenAlarmManagedObjectClass     SnmpAdminString,
cenAlarmManagedObjectAddressType InetAddressType,
cenAlarmManagedObjectAddress   InetAddress,
cenAlarmDescription             OCTET STRING,
cenAlarmSeverity                Integer32,
cenAlarmSeverityDefinition      SnmpAdminString,
cenAlarmTriageValue            Integer32,
cenEventIDList                  OCTET STRING,
cenUserMessage1                 SnmpAdminString,
cenUserMessage2                 SnmpAdminString,
cenUserMessage3                 SnmpAdminString,
cenAlarmMode                    INTEGER,
cenPartitionNumber              Unsigned32,
cenPartitionName                SnmpAdminString,
cenCustomerIdentification       SnmpAdminString,
cenCustomerRevision             SnmpAdminString,
cenAlertID                      SnmpAdminString
}

-- Alarm attributes

cenAlarmIndex      OBJECT-TYPE
    SYNTAX          Unsigned32 (1..4294967295)
    MAX-ACCESS      not-accessible
    STATUS          current
    DESCRIPTION
        "A monotonically increasing integer for the sole
        purpose of indexing the attributes in
        ciscoEpmNotificationMIBObjects. When the maximum value is
        reached, this value wraps back to 1."
    ::= { cenAlarmEntry 1 }

cenAlarmVersion    OBJECT-TYPE
    SYNTAX          SnmpAdminString (SIZE(1..16))
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The release version of this MIB. The version string will
        be of the form <major version>.<minorversion>."
    ::= { cenAlarmEntry 2 }

cenAlarmTimestamp  OBJECT-TYPE
    SYNTAX          TimeStamp
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "The time when the alarm was raised."
    ::= { cenAlarmEntry 3 }

cenAlarmUpdatedTimestamp OBJECT-TYPE
    SYNTAX          TimeStamp
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION

```

```

"Alarms persist over time and can have their field(s)
change values. The last time a field(s) changed, this
alarm is updated. The updated time denotes this time.
Each alarm is identified by the unique alarm instance
id, cenAlarmInstanceID."
 ::= { cenAlarmEntry 4 }

cenAlarmInstanceID      OBJECT-TYPE
    SYNTAX                SnmpAdminString (SIZE(1..20))
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
        "The Unique Alarm Instance ID."
    ::= { cenAlarmEntry 5 }

cenAlarmStatus          OBJECT-TYPE
    SYNTAX                Integer32 (1..250)
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
        "The alarm status indicates the status of the alarm
in integer value."
    ::= { cenAlarmEntry 6 }

cenAlarmStatusDefinition OBJECT-TYPE
    SYNTAX                SnmpAdminString (SIZE(1..255))
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
        "The short description of the status of the alarm.
The string is formatted in
'<integer>,<alarmStatus description>' tuples. The <integer>
value is the same value that the 'cenAlarmStatus'
attribute holds. <alarmStatus description> contains one line
description of the alarm status generated."
    ::= { cenAlarmEntry 7 }

cenAlarmType            OBJECT-TYPE
    SYNTAX                INTEGER {
        unknown(1),
        direct(2),
        indirect(3),
        mixed(4)
    }
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
        "unknown:  When the value for this attribute could not be
determined.

        direct:   Denotes an alarm generated by a set of events where
all events are reported by an observation(s) of a
managed object.

        indirect: Denotes an alarm generated by a set of events where
all events were deduced or inferred by the status of
managed objects as determined by the network
management system.

        mixed:    Denotes an alarm generated by a set of events which
were either direct or indirect."
    ::= { cenAlarmEntry 8 }

cenAlarmCategory        OBJECT-TYPE
    SYNTAX                Integer32 (1..250)
    MAX-ACCESS            read-only
    STATUS                 current

```

```

DESCRIPTION
"The category of the alarm generated represented in
integer value."
 ::= { cenAlarmEntry 9 }

cenAlarmCategoryDefinition      OBJECT-TYPE
SYNTAX                          SnmpAdminString (SIZE(1..255))
MAX-ACCESS                       read-only
STATUS                           current
DESCRIPTION
"The short description of the category of the alarm
generated. The String is formatted in
'<integer>,<alarmCategory description>' tuples. The <integer>
value is the same value that the 'cenAlarmCategory'
attribute holds. <alarmCategory description> contains one
line description of the alarm category generated."
 ::= { cenAlarmEntry 10 }

cenAlarmServerAddressType      OBJECT-TYPE
SYNTAX                          InetAddressType
MAX-ACCESS                       read-only
STATUS                           current
DESCRIPTION
"The type of Internet address by which the server
is reachable. The Server is the server
that is generating this trap."
 ::= { cenAlarmEntry 11 }

cenAlarmServerAddress          OBJECT-TYPE
SYNTAX                          InetAddress
MAX-ACCESS                       read-only
STATUS                           current
DESCRIPTION
"The IP Address or the DNS name of the Management
Server that raised this alarm to be notified."
 ::= { cenAlarmEntry 12 }

cenAlarmManagedObjectClass    OBJECT-TYPE
SYNTAX                          SnmpAdminString (SIZE(1..255))
MAX-ACCESS                       read-only
STATUS                           current
DESCRIPTION
"The class of the managed object for which this
alarm was generated. For example, Router, Switch,
GateKeeper and VoicePort."
 ::= { cenAlarmEntry 13 }

cenAlarmManagedObjectAddressType OBJECT-TYPE
SYNTAX                          InetAddressType
MAX-ACCESS                       read-only
STATUS                           current
DESCRIPTION
"The type of Internet address by which the managed
object is reachable."
 ::= { cenAlarmEntry 14 }

cenAlarmManagedObjectAddress  OBJECT-TYPE
SYNTAX                          InetAddress
MAX-ACCESS                       read-only
STATUS                           current
DESCRIPTION
"The IP Address or the DNS name of the Managed Object."
 ::= { cenAlarmEntry 15 }

```

```

cenAlarmDescription          OBJECT-TYPE
    SYNTAX                   OCTET STRING (SIZE(1..1024))
    MAX-ACCESS               read-only
    STATUS                   current
    DESCRIPTION
        "A detailed description of the alarm."
    ::= { cenAlarmEntry 16 }

cenAlarmSeverity            OBJECT-TYPE
    SYNTAX                   Integer32 (0..100)
    MAX-ACCESS               read-only
    STATUS                   current
    DESCRIPTION
        "The alarm severity indicates the severity of the alarm
        in integer value."
    ::= { cenAlarmEntry 17 }

cenAlarmSeverityDefinition  OBJECT-TYPE
    SYNTAX                   SnmpAdminString (SIZE(1..255))
    MAX-ACCESS               read-only
    STATUS                   current
    DESCRIPTION
        "The short description of the severity of the alarm
        generated. The String is formatted in
        '<integer>,<alarmSeverity description>' tuples. The <integer>
        value is the same value that the 'cenAlarmSeverity '
        attribute holds. <alarmSeverity description> contains one line
        description of the alarm severity generated."
    ::= { cenAlarmEntry 18 }

cenAlarmTriageValue        OBJECT-TYPE
    SYNTAX                   Integer32(0..100)
    MAX-ACCESS               read-only
    STATUS                   current
    DESCRIPTION
        "The triage value of an alarm is a hierarchical weighting value
        (applied by the application, and more importantly customizable
        by the end user) to allow an artificial form of evaluating
        impact, interest, or other user-determined functions between
        alarms. The value is a positive number or zero where zero
        denotes an undetermined or uncomputable value."
    ::= { cenAlarmEntry 19 }

cenEventIDList             OBJECT-TYPE
    SYNTAX                   OCTET STRING (SIZE(1..1024))
    MAX-ACCESS               read-only
    STATUS                   current
    DESCRIPTION
        "Comma separated list of the Unique Event identifiers
        that led to the generation of this Alarm."
    ::= { cenAlarmEntry 20 }

cenUserMessage1            OBJECT-TYPE
    SYNTAX                   SnmpAdminString (SIZE(1..255))
    MAX-ACCESS               read-only
    STATUS                   current
    DESCRIPTION
        "User input message. This value can be configured."
    ::= { cenAlarmEntry 21 }

cenUserMessage2            OBJECT-TYPE
    SYNTAX                   SnmpAdminString (SIZE(1..255))
    MAX-ACCESS               read-only
    STATUS                   current

```

```

DESCRIPTION
  "User input message. This value can be configured."
  ::= { cenAlarmEntry 22 }

cenUserMessage3          OBJECT-TYPE
    SYNTAX                SnmpAdminString (SIZE(1..255))
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
      "User input message. This value can be configured."
      ::= { cenAlarmEntry 23 }

cenAlarmMode             OBJECT-TYPE
    SYNTAX                INTEGER {
        unknown(1),
        alert(2),
        event(3)
    }
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
      "unknown:  When the value for this attribute could not be
        determined.

        alert:   Denotes an alarm generated by a set of events where
          all events are reported by polling of managed
          objects and/or listening to SNMP notifications.

        event:   Denotes an event generated by polling of managed
          objects and/or listening to SNMP notifications."
      ::= { cenAlarmEntry 24 }

cenPartitionNumber      OBJECT-TYPE
    SYNTAX                Unsigned32(0..100)
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
      "In traps generated by the management application that support
        multiple partitions, the attribute will carry the integer
        value assigned to identify the logical group where the managed
        device resides."
      ::= { cenAlarmEntry 25 }

cenPartitionName        OBJECT-TYPE
    SYNTAX                SnmpAdminString (SIZE(1..255))
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
      "In traps generated by the management application that support
        multiple partitions, the attribute will carry the name
        assigned to identify the logical group where the managed
        device resides."
      ::= { cenAlarmEntry 26 }

cenCustomerIdentification OBJECT-TYPE
    SYNTAX                SnmpAdminString (SIZE(1..255))
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION
      "User input message. The attribute takes in a free format
        text. This attribute can be used by advanced management
        applications to sort responses from the fault management
        server."
      ::= { cenAlarmEntry 27 }

cenCustomerRevision     OBJECT-TYPE

```

```

SYNTAX          SnmpAdminString (SIZE(1..255))
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION     "User input message. The attribute takes in a free format
                text. This attribute can be used by advanced management
                applications to sort responses from the fault management
                server."
 ::= { cenAlarmEntry 28 }

cenAlertID      OBJECT-TYPE
SYNTAX          SnmpAdminString (SIZE(1..20))
MAX-ACCESS      read-only
STATUS          current
DESCRIPTION     "In event based notification, this attribute will contain the
                alert id to which the generated event has been rolled up
                to. In alert based notification, the cenAlarmInstanceId and
                cenAlertID would be identical."
 ::= { cenAlarmEntry 29 }

ciscoEpmNotificationAlarm  NOTIFICATION-TYPE
OBJECTS {
    cenAlarmVersion,
    cenAlarmTimestamp,
    cenAlarmUpdatedTimestamp,
    cenAlarmInstanceId,
    cenAlarmStatus,
    cenAlarmStatusDefinition,
    cenAlarmType,
    cenAlarmCategory,
    cenAlarmCategoryDefinition,
    cenAlarmServerAddressType,
    cenAlarmServerAddress,
    cenAlarmManagedObjectClass,
    cenAlarmManagedObjectAddressType,
    cenAlarmManagedObjectAddress,
    cenAlarmDescription,
    cenAlarmSeverity,
    cenAlarmSeverityDefinition,
    cenAlarmTriageValue,
    cenEventIDList,
    cenUserMessage1,
    cenUserMessage2,
    cenUserMessage3
}
STATUS          deprecated
DESCRIPTION     "Notification of the status of the managed object as
                generated by the management server.

                New attributes are added to the ciscoEpmNotificationAlarmRev1.
                Hence this notification is deprecated."
 ::= { ciscoEpmNotificationMIBNotifs 1 }

ciscoEpmNotificationAlarmRev1  NOTIFICATION-TYPE
OBJECTS {
    cenAlarmVersion,
    cenAlarmTimestamp,
    cenAlarmUpdatedTimestamp,
    cenAlarmInstanceID,
    cenAlarmStatus,
    cenAlarmStatusDefinition,
    cenAlarmType,

```

```

        cenAlarmCategory,
        cenAlarmCategoryDefinition,
        cenAlarmServerAddressType,
        cenAlarmServerAddress,
        cenAlarmManagedObjectClass,
        cenAlarmManagedObjectAddressType,
        cenAlarmManagedObjectAddress,
        cenAlarmDescription,
        cenAlarmSeverity,
        cenAlarmSeverityDefinition,
        cenAlarmTriageValue,
        cenEventIDList,
        cenUserMessage1,
        cenUserMessage2,
        cenUserMessage3,
        cenAlarmMode,
        cenPartitionNumber,
        cenPartitionName,
        cenCustomerIdentification,
        cenCustomerRevision,
        cenAlertID
    }
    STATUS current
    DESCRIPTION
    "Notification of the status of the managed object as
    generated by the management server."
    ::= { ciscoEpmNotificationMIBNotifs 2 }

-- Conformance information

ciscoEpmNotificationMIBCompliances OBJECT IDENTIFIER
    ::= { ciscoEpmNotificationMIBConform 1 }
ciscoEpmNotificationMIBGroups OBJECT IDENTIFIER
    ::= { ciscoEpmNotificationMIBConform 2 }

-- Compliance

ciscoEpmNotificationMIBCompliance MODULE-COMPLIANCE
    STATUS deprecated
    DESCRIPTION
    "The compliance statement for entities which
    implement the CISCO-EPM-NOTIFICATION-MIB.

    New attributes are included in
    ciscoEpmNotificationMIBComplianceRev1. Hence this object is
    deprecated."
    MODULE -- this module
    MANDATORY-GROUPS {
        ciscoEpmNotificationObjectsGroup,
        ciscoEpmNotificationAlarmGroup
    }

    GROUP ciscoEpmAlarmConfigGroup
    DESCRIPTION
    "This group is optional."

    OBJECT cenAlarmTableMaxLength
    MIN-ACCESS read-only
    DESCRIPTION
    "Write access is not required."

    OBJECT cenAlarmVersion
    MIN-ACCESS accessible-for-notify

```

```

DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmTimestamp
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmUpdatedTimestamp
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmInstanceID
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmStatus
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmStatusDefinition
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmType
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmCategory
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmCategoryDefinition
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmServerAddressType
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmServerAddress
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmManagedObjectClass
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmManagedObjectAddressType
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmManagedObjectAddress

```

```

MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmDescription
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmSeverity
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmSeverityDefinition
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmTriageValue
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenEventIDList
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenUserMessage1
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenUserMessage2
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenUserMessage3
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."
 ::= { ciscoEpmNotificationMIBCompliances 1 }

ciscoEpmNotificationMIBComplianceRev1 MODULE-COMPLIANCE
STATUS current
DESCRIPTION
    "The compliance statement for entities which
    implement the CISCO-EPM-NOTIFICATION-MIB."
MODULE -- this module
MANDATORY-GROUPS {
    ciscoEpmNotificationObjectsGroupRev1,
    ciscoEpmNotificationAlarmGroupRev1
}

GROUP      ciscoEpmAlarmConfigGroup
DESCRIPTION
    "This group is optional."

OBJECT cenAlarmTableMaxLength
MIN-ACCESS read-only
DESCRIPTION
    "Write access is not required."

```

```

OBJECT cenAlarmVersion
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmTimestamp
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmUpdatedTimestamp
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmInstanceID
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmStatus
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmStatusDefinition
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmType
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmCategory
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmCategoryDefinition
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmServerAddressType
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmServerAddress
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmManagedObjectClass
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmManagedObjectAddressType
MIN-ACCESS accessible-for-notify
DESCRIPTION

```

```

        "Read access is not required."

OBJECT cenAlarmManagedObjectAddress
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmDescription
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmSeverity
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmSeverityDefinition
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmTriageValue
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenEventIDList
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenUserMessage1
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenUserMessage2
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenUserMessage3
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlarmMode
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenPartitionNumber
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenPartitionName
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenCustomerIdentification
MIN-ACCESS accessible-for-notify

```

```

DESCRIPTION
    "Read access is not required."

OBJECT cenCustomerRevision
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

OBJECT cenAlertID
MIN-ACCESS accessible-for-notify
DESCRIPTION
    "Read access is not required."

 ::= { ciscoEpmNotificationMIBCompliance 2 }

-- Units of Conformance

ciscoEpmNotificationAlarmGroup NOTIFICATION-GROUP
    NOTIFICATIONS {
        ciscoEpmNotificationAlarm
    }
    STATUS      deprecated
    DESCRIPTION
        "The collection of notifications used to indicate managed
        object status.

        ciscoEpmNotificationAlarmGroupRev1 is defined. Hence this
        object is deprecated."
    ::= { ciscoEpmNotificationMIBGroups 1 }

ciscoEpmNotificationObjectsGroup OBJECT-GROUP
    OBJECTS {
        cenAlarmVersion,
        cenAlarmTimestamp,
        cenAlarmUpdatedTimestamp,
        cenAlarmInstanceID,
        cenAlarmStatus,
        cenAlarmStatusDefinition,
        cenAlarmType,
        cenAlarmCategory,
        cenAlarmCategoryDefinition,
        cenAlarmServerAddressType,
        cenAlarmServerAddress,
        cenAlarmManagedObjectClass,
        cenAlarmManagedObjectAddressType,
        cenAlarmManagedObjectAddress,
        cenAlarmDescription,
        cenAlarmSeverity,
        cenAlarmSeverityDefinition,
        cenAlarmTriageValue,
        cenEventIDList,
        cenUserMessage1,
        cenUserMessage2,
        cenUserMessage3
    }
    STATUS      deprecated
    DESCRIPTION
        "Trap reflecting the alarm.

        New attributes are added to the new notification
        ciscoEpmNotificationObjectsGroupRev1. Hence
        this object is deprecated."
    ::= { ciscoEpmNotificationMIBGroups 2 }

```

```

ciscoEpmAlarmConfigGroup      OBJECT-GROUP
    OBJECTS { cenAlarmTableMaxLength }
    STATUS      current
    DESCRIPTION
        "A collection of objects providing information
        about the total number of cenAlarmTable entries
        maintained."
    ::= { ciscoEpmNotificationMIBGroups 3 }

ciscoEpmNotificationAlarmGroupRev1 NOTIFICATION-GROUP
    NOTIFICATIONS {
        ciscoEpmNotificationAlarmRev1
    }
    STATUS      current
    DESCRIPTION
        "The collection of notifications used to indicate managed object
        status."
    ::= { ciscoEpmNotificationMIBGroups 4 }

ciscoEpmNotificationObjectsGroupRev1      OBJECT-GROUP
    OBJECTS {
        cenAlarmVersion,
        cenAlarmTimestamp,
        cenAlarmUpdatedTimestamp,
        cenAlarmInstanceID,
        cenAlarmStatus,
        cenAlarmStatusDefinition,
        cenAlarmType,
        cenAlarmCategory,
        cenAlarmCategoryDefinition,
        cenAlarmServerAddressType,
        cenAlarmServerAddress,
        cenAlarmManagedObjectClass,
        cenAlarmManagedObjectAddressType,
        cenAlarmManagedObjectAddress,
        cenAlarmDescription,
        cenAlarmSeverity,
        cenAlarmSeverityDefinition,
        cenAlarmTriageValue,
        cenEventIDList,
        cenUserMessage1,
        cenUserMessage2,
        cenUserMessage3,
        cenAlarmMode,
        cenPartitionNumber,
        cenPartitionName,
        cenCustomerIdentification,
        cenCustomerRevision,
        cenAlertID
    }
    STATUS      current
    DESCRIPTION
        "Notification reflecting the alarm."
    ::= { ciscoEpmNotificationMIBGroups 5 }

END

```



## MWTM 6.1 Monitor Attributes

The following sections describe the MWTM 6.1 Monitor attributes:

- [Attribute Types, page E-1](#)
- [Monitor Network Element Attributes, page E-2](#)
- [Monitor Attribute Groups, page E-19](#)

### Attribute Types



**Note**

- Unless specifically noted, all attribute names are regular attributes with a name and a value. The attribute name is unique for the specified network element type or attribute group. The attribute name will appear once and only once for the specified network element or attribute group.
- If an attribute has the note: “this attribute is an array”, then this attribute name might appear 0, 1, or several times in the specified network element or attribute group.
- If an attribute has the note: “this is an attribute group”, then this refers to an attribute group. A detailed attribute list within the attribute group definition is at the end of this appendix. This attribute group might appear once and only once for the specified network element or attribute group.
- If an attribute has the note: “this is an attribute group”, and also the note: “this attribute is an array”, then this refers to an attribute group. A detailed attribute list within the attribute group definition is at the end of this appendix. This attribute group might appear 0, 1, or several times in the specified network element or attribute group.

**Table E-1**      **Attribute Types**

Attribute Type	Description	Example(s)
String	String	“abc”, “string with spaces”
Integer	Integer	“100”, “-77”
IPAddress	IP Address	“1.1.1.1”, “255.255.255.0”
PointCode	Point Code	“3.5.7”, “255.255.0”

**Table E-1** Attribute Types (continued)

Attribute Type	Description	Example(s)
Timestamp	Formatted as XML schema type: "dateTime"	"2006-12-19T18:22:31.878-05:00"
Period	Formatted as XML schema type: "duration"	"P21DT6H39M38.380S"

## Monitor Network Element Attributes

The following tables describe the MWTM 6.1 Monitor network element types:

- Network Element: type="APN"
- Network Element: type="AS"
- Network Element: type="ASP"
- Network Element: type="ASPA"
- Network Element: type="Card"
- Network Element: type="Folder"
- Network Element: type="Interface"
- Network Element: type="Interface", subtype="GSM"
- Network Element: type="Interface", subtype="RAN"
- Network Element: type="Interface", subtype="UMTS"
- Network Element: type="Link"
- Network Element: type="Linkset"
- Network Element: type="Node"
- Network Element: type="Node", subtype="IP-RAN"
- Network Element: type="Node", subtype="ITP"
- Network Element: type="Node", subtype="ONS"
- Network Element: type="Node", subtype="RAN\_SVC"
- Network Element: type="RBH"
- Network Element: type="SGMP"
- Network Element: type="SP"

**Table E-2** Network Element: type="APN"

Attribute Name	Type	Context	Description
RDN	String	All	Relative Distinguished Name
AaaServerGroupName	String	Monitor	The AAA Server Group assigned to this APN
AlarmSeverity	String	Monitor	Network Element Alarm State
IgnoreState	Integer	Monitor	Whether to ignore state of this network element for status aggregation

**Table E-2** Network Element: type="APN" (continued)

Attribute Name	Type	Context	Description
Index	Integer	Monitor	APN Index
IpPoolName	String	Monitor	The IP Pool assigned to this APN
IsAPNInstance	Integer	Monitor	Whether this is an Instance or Top-level APN
PrimaryDns	IP Address	Monitor	The Primary Dns assigned to this APN
SecondaryDns	IP Address	Monitor	The Secondary Dns assigned to this APN
ServiceMode	String	Monitor	The current Service Mode of this APN
State	String	Monitor	Network Element State
StateReason	String	Monitor	Network Element State Reason
StateTimestamp	Timestamp	Monitor	Timestamp when network element state was last changed
VrfName	String	Monitor	The VRF assigned to this APN

**Table E-3** Network Element: type="AS"

Attribute Name	Type	Context	Description
RDN	String	All	Relative Distinguished Name
ASPA Number	Integer	Monitor	Number of ASP associations
ActiveASPs	Integer	Monitor	Number of active ASP associations
AlarmSeverity	String	Monitor	Network element alarm state
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.
MateState	String	Monitor	Mate state
Protocol	String	Monitor	Protocol
QOS	String	Monitor	QoS value
RoutingKey	String	Monitor	Routing key
State	String	Monitor	Network element state
StateReason	String	Monitor	Network element state reason
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.
TrafficMode	String	Monitor	Traffic mode

**Table E-4** Network Element: type="ASP"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AlarmSeverity	String	Monitor	Network element alarm state	
CustomIcon	String	Monitor	Custom icon	
DefaultIcon	String	Monitor	Default icon	

Table E-4 Network Element: type="ASP" (continued)

Attribute Name	Type	Context	Description	Comments
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
LocalAddress	IPAddress	Monitor	A list of local addresses	This attribute is an array.
LocalPort	Long	Monitor	Local port	
Name	String	Monitor	A list of names	This attribute is an array.
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.	

Table E-5 Network Element: type="ASPA"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AlarmSeverity	String	Monitor	Network element alarm state	
ConfigLocalAddress	IPAddress	Monitor	Configured local addresses (SCTP)	This attribute is an array.
ConfigLocalInterface	String	Monitor	Configured local interfaces (SCTP)	This attribute is an array.
ConfigLocalPort	Integer	Monitor	Configured local port (SCTP)	
ConfigRemoteAddress	IPAddress	Monitor	Configured remote addresses (SCTP)	This attribute is an array.
ConfigRemotePort	Integer	Monitor	Configured remote port (SCTP)	
CongestionState	String	Monitor	Congestion state	
EffectiveLocalAddress	IPAddress	Monitor	Effective local address (SCTP)	
EffectiveLocalInterface	String	Monitor	Effective local interface name (SCTP)	
EffectiveRemoteAddress	IPAddress	Monitor	Effective remote address (SCTP)	
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
LocalAddress	IPAddress	Monitor	Local address (SCTP)	This attribute is an array.
LocalAddressState	String	Monitor	Local address states (SCTP)	This attribute is an array.
LocalPort	Integer	Monitor	Local port (SCTP)	
PrimaryRemoteAddress	IPAddress	Monitor	Primary remote address (SCTP)	
Protocol	String	Monitor	Protocol	
QOS	Integer	Monitor	QoS value	

**Table E-5** Network Element: type="ASPA" (continued)

Attribute Name	Type	Context	Description	Comments
RemoteAddress	IPAddress	Monitor	Remote addresses (SCTP)	This attribute is an array.
RemoteAddressState	String	Monitor	Remote address states (SCTP)	This attribute is an array.
RemotePort	Integer	Monitor	Remote port (SCTP)	
SCTPState	String	Monitor	SCTP state	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.	

**Table E-6** Network Element: type="Card"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AlarmSeverity	String	Monitor	Network element alarm state	
CardType	String	Monitor	Card type	
Description	String	Monitor	Description	
EquipStatus	String	Monitor	Equipment status	
FirmwareRevision	String	Monitor	Firmware revision	
HardwareRevision	String	Monitor	Hardware revision	
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
ManufacturerName	String	Monitor	Manufacturer name	
ModelName	String	Monitor	Model name	
ProtectionGroup	Protection	Monitor	Protection information	This attribute is an array and an attribute group.
SerialNumber	String	Monitor	Serial number	
ServiceStatus	String	Monitor	Service status	
SlotNumber	Integer	Monitor	Slot number	
SoftwareRevision	String	Monitor	Software revision	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.	

**Table E-7** Network Element: type="Folder"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AlarmSeverity	String	Monitor	Network element alarm state	
FolderType	String	Monitor	Folder type	
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.	

**Table E-8** Network Element: type="Interface"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AdminState	String	Monitor	Administrative state	
AlarmSeverity	String	Monitor	Network element alarm state	
IPAddresses	IPAddress	Monitor	IP addresses	This attribute is an array.
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
MaxPacketSize	Integer	Monitor	Maximum packet size	
OperationState	String	Monitor	Operational state	
PhysicalAddress	String	Monitor	Physical address	
ShortInterfaceName	String	Monitor	The value to the left of the dash (if present) in the RDN.	
Speed	Long	Monitor	Interface speed	
SpeedReceive	Long	Monitor	Interface receive speed	
SpeedSend	Long	Monitor	Interface send speed	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element was last changed.	
Type	String	Monitor	Interface type	

**Table E-9** Network Element: type="Interface", subtype="GSM"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AdminState	String	Monitor	Administrative state	
AlarmSeverity	String	Monitor	Network element alarm state	
ConnectionState	String	Monitor	RAN-O Peering connection state	
IPAddresses	IPAddress	Monitor	IP addresses	This attribute is an array.
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
IsOptimized	Integer	Monitor	Whether this shorthaul interface is optimized	
LocalAddress	IPAddress	Monitor	RAN Peering local IP Address	
LocalPort	Integer	Monitor	RAN Peering local port	
LocalState	String	Monitor	RAN Peering local state	
MaxPacketSize	Integer	Monitor	Maximum packet size	
OperationState	String	Monitor	Operational state	
PeerSerialNumber	String	Monitor	RAN Peering peer serial number	
PhysicalAddress	String	Monitor	Physical address	
Protocol	String	Monitor	RAN-O Peering protocol type	
RedundancyState	String	Monitor	RAN-O Peering redundancy state	
RemoteAddress	IPAddress	Monitor	RAN-O Peering remote address	
RemotePort	Integer	Monitor	RAN-O Peering remote port	
RemoteState	String	Monitor	RAN-O Peering remote state	
ShortInterfaceName	String	Monitor	The value to the left of the dash (if present) in the RDN.	
Speed	Long	Monitor	Interface speed	
SpeedReceive	Long	Monitor	Interface receive speed	
SpeedSend	Long	Monitor	Interface send speed	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element was last changed.	
Type	String	Monitor	Interface type	

Table E-10 Network Element: type="Interface", subtype="RAN"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AdminState	String	Monitor	Administrative state	
AlarmSeverity	String	Monitor	Network element alarm state	
ConnectionState	String	Monitor	RAN-O Peering connection state	
IPAddresses	IPAddress	Monitor	IP addresses	This attribute is an array.
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
IsOptimized	Integer	Monitor	Whether this shorthaul interface is optimized	
LocalAddress	IPAddress	Monitor	RAN Peering local IP address	
LocalPort	Integer	Monitor	RAN Peering local port	
MaxPacketSize	Integer	Monitor	Maximum packet size	
OperationState	String	Monitor	Operational state	
PeerSerialNumber	String	Monitor	RAN Peering peer serial number	
PhysicalAddress	String	Monitor	Physical address	
Protocol	String	Monitor	RAN-O Peering protocol type	
RedundancyState	String	Monitor	RAN-O Peering redundancy state	
RemoteAddress	IPAddress	Monitor	RAN-O Peering remote address	
RemotePort	Integer	Monitor	RAN-O Peering remote port	
ShortInterfaceName	String	Monitor	The value to the left of the dash (if present) in the RDN.	
Speed	Long	Monitor	Interface speed	
SpeedReceive	Long	Monitor	Interface receive speed	
SpeedSend	Long	Monitor	Interface send speed	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element was last changed.	
Type	String	Monitor	Interface type	

Table E-11 Network Element: type="Interface", subtype="UMTS"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AdminState	String	Monitor	Administrative state	
AlarmSeverity	String	Monitor	Network element alarm state	

**Table E-11** Network Element: type="Interface", subtype="UMTS" (continued)

Attribute Name	Type	Context	Description	Comments
ConnectionState	String	Monitor	RAN Peering connection state	
IPAddresses	IPAddress	Monitor	IP addresses	This attribute is an array.
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
IsOptimized	Integer	Monitor	Whether this shorthaul interface is optimized	
LocalAddress	IPAddress	Monitor	RAN Peering local IP address	
LocalPort	Integer	Monitor	RAN Peering local port	
LocalReceiveAlarmState	String	Monitor	RAN Peering local receive alarm state	
LocalTransmitAlarmState	String	Monitor	RAN Peering local transmit alarm state	
MaxPacketSize	Integer	Monitor	Maximum packet size	
OperationState	String	Monitor	Operational state	
PeerSerialNumber	String	Monitor	RAN Peering peer serial number	
PhysicalAddress	String	Monitor	Physical address	
Protocol	String	Monitor	RAN Peering protocol type	
RedundancyState	String	Monitor	RAN Peering redundancy state	
RemoteAddress	IPAddress	Monitor	RAN Peering remote address	
RemotePort	Integer	Monitor	RAN Peering remote port	
RemoteReceiveAlarmState	String	Monitor	RAN Peering remote receive alarm state	
RemoteTransmitAlarmState	String	Monitor	RAN Peering remote transmit alarm state	
ShortInterfaceName	String	Monitor	The value to the left of the dash (if present) in the RDN.	
Speed	Long	Monitor	Interface speed	
SpeedReceive	Long	Monitor	Interface receive speed	
SpeedSend	Long	Monitor	Interface send speed	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element was last changed.	
Type	String	Monitor	Interface type	

**Table E-12** Network Element: type="Link"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AlarmSeverity	String	Monitor	Network element alarm state	
ConfigLocalAddress	IPAddress	Monitor	Configured local addresses (SCTP)	This attribute is an array.

Table E-12 Network Element: type="Link" (continued)

Attribute Name	Type	Context	Description	Comments
ConfigLocalInterface	String	Monitor	Configured local interfaces (SCTP)	This attribute is an array.
ConfigLocalPort	Integer	Monitor	Configured local port (SCTP)	
ConfigRemoteAddress	IPAddress	Monitor	Configured remote addresses (SCTP)	This attribute is an array.
ConfigRemotePort	Integer	Monitor	Configured remote port (SCTP)	
CongestionState	String	Monitor	Congestion state	
EffectiveLocalAddress	IPAddress	Monitor	Effective local address (SCTP)	
EffectiveLocalInterface	Integer	Monitor	Effective local interface name (SCTP)	
EffectiveRemoteAddress	String	Monitor	Effective remote address (SCTP)	
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
InterfaceName	String	Monitor	Interface name (Serial/HSL link)	
LinkType	String	Monitor	Link type	
LocalAddress	IPAddress	Monitor	Local address (SCTP)	This attribute is an array.
LocalAddressState	String	Monitor	Local address states (SCTP)	This attribute is an array.
LocalPort	Integer	Monitor	Local port (SCTP)	
PrimaryRemoteAddress	IPAddress	Monitor	Primary remote address (SCTP)	
QOS	Integer	Monitor	QoS value	
ReceiveUtilizationState	String	Monitor	Receive utilization state	
RemoteAddress	IPAddress	Monitor	Remote addresses (SCTP)	This attribute is an array.
RemoteAddressState	String	Monitor	Remote address states (SCTP)	This attribute is an array.
RemotePort	Integer	Monitor	Remote port (SCTP)	
SCTPState	String	Monitor	SCTP state	
SLC	Integer	Monitor	Link SLC	
SendUtilizationState	String	Monitor	Send utilization state	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.	

Table E-13 Network Element: type="Linkset"

Attribute Name	Type	Context	Description
RDN	String	All	Relative Distinguished Name
ActiveLinks	Integer	Monitor	Number of active links
AdjacentPointCode	PointCode	Monitor	Adjacent point code
AlarmSeverity	String	Monitor	Network element alarm state
CongestedLinks	Integer	Monitor	Number of congested links

**Table E-13** Network Element: type="Linkset" (continued)

Attribute Name	Type	Context	Description
Description	String	Monitor	Description
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.
InboundACL	Integer	Monitor	Inbound access list
LinkNumber	Integer	Monitor	Total number of links
LinkType	String	Monitor	Link type
LocalPointCode	PointCode	Monitor	Local point code
OutboundACL	Integer	Monitor	Outbound access list
State	String	Monitor	Network element state
StateReason	String	Monitor	Network element state reason
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.

**Table E-14** Network Element: type="Node"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AlarmSeverity	String	Monitor	Network element alarm state	
AveragePollTimePeriod	Period	Monitor	Average time for status poll on a node.	
ConnectAddress	String	Monitor	IP address and port for terminal connection.	
CustomIcon	String	Monitor	Custom icon	
CustomName	String	Monitor	Custom name for node	
DefaultIcon	String	Monitor	Default icon	
DeviceCapabilities	DeviceCapabilities	Monitor	Device capabilities	This is an attribute group.
DeviceType	String	Monitor	Device type	
DiscoveredTimeStamp	TimeStamp	Monitor	When this node was initially discovered.	
EnableProcessTraps	Integer	Monitor	Whether to process traps for this node.	
EnableReportPolling	Integer	Monitor	Whether to enable report polling for this node.	
EnableTrapPolling	Integer	Monitor	Whether to enable trap triggered polling for this node.	
IPAddressInfo	IpAddressInfo	Monitor	Information about IP addresses on this node.	This is an attribute group.
IgnoreState	Integer	Monitor	Whether to ignore state of this network element for status aggregation.	
LastPollTimePeriod	Period	Monitor	How long did the last status poll take.	
LastPollTimestamp	TimeStamp	Monitor	Last status poll timestamp	

Table E-14 Network Element: type="Node" (continued)

Attribute Name	Type	Context	Description	Comments
ParsedVersion	String	Monitor	Device image version parsed from sysdescr.	
RebootReason	String	Monitor	Reboot reason	
SerialNumber	String	Monitor	Device serial number	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.	
SysDescr	String	Monitor	sysDescr for node	
SysName	String	Monitor	sysName for node	
SysUpTime	Period	Monitor	sysUpTime for node	
TrapsProcessedManually	Integer	Monitor	Whether trap processing is manually or automatically enabled by the system.	

Table E-15 Network Element: type="Node", subtype="IP-RAN"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AcceptableThreshold	Integer	Monitor	Node level acceptable threshold for backhaul traffic.	
AlarmSeverity	String	Monitor	Network element alarm state	
AveragePollTimePeriod	Period	Monitor	Average time for status poll on a node.	
ConnectAddress	String	Monitor	IP address and port for terminal connection.	
CustomIcon	String	Monitor	Custom icon	
CustomName	String	Monitor	Custom name for node	
DefaultIcon	String	Monitor	Default icon	
DeviceCapabilities	DeviceCapabilities	Monitor	Device capabilities	This is an attribute group.
DeviceType	String	Monitor	Device type	
DiscoveredTimestamp	Timestamp	Monitor	When this node was initially discovered.	
EnableProcessTraps	Integer	Monitor	Whether to process traps for this node.	
EnableReportPolling	Integer	Monitor	Whether to enable report polling for this node.	
EnableTrapPolling	Integer	Monitor	Whether to enable trap triggered polling for this node.	
IPAddressInfo	IpAddressInfo	Monitor	Information about IP addresses on this node.	This is an attribute group.
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	

**Table E-15** Network Element: *type="Node", subtype="IP-RAN"* (continued)

Attribute Name	Type	Context	Description	Comments
LastPollTimePeriod	Period	Monitor	How long did the last status poll take.	
LastPollTimestamp	Timestamp	Monitor	Last status poll timestamp	
Location	String	Monitor	Location for RAN node: AggregationSite or CellSite.	
OverloadThreshold	Integer	Monitor	Node level overload threshold for backhaul traffic.	
ParsedVersion	String	Monitor	Device image version parsed from sysdescr.	
RebootReason	String	Monitor	Reboot reason	
RecognizedVersion	String	Monitor	Recognized device image Version	
SNMPAccess	String	Monitor	SNMP Access Method: InBand or OutOfBand.	
SerialNumber	String	Monitor	Device serial number	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.	
SysDescr	String	Monitor	sysDescr for node	
SysName	String	Monitor	sysName for node	
SysUpTime	Period	Monitor	sysUpTime for node	
TrapsProcessedManually	Integer	Monitor	Whether trap processing is manually or automatically enabled by the system.	
WarningThreshold	Integer	Monitor	Node level warning threshold for backhaul traffic.	

**Table E-16** Network Element: *type="Node", subtype="ITP"*

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AlarmSeverity	String	Monitor	Network element alarm state	
AveragePollTimePeriod	Period	Monitor	Average time for status poll on a node.	
CLLIcode	String	Monitor	CLLI code of ITP	
ConnectAddress	String	Monitor	IP address and port for terminal connection.	
CustomIcon	String	Monitor	Custom icon	
CustomName	String	Monitor	User-specified name	
DefaultIcon	String	Monitor	Default icon	
DeviceCapabilities	DeviceCapabilities	Monitor	Device capabilities	This is an attribute group.
DeviceType	String	Monitor	Device type	

Table E-16 Network Element: type="Node", subtype="ITP" (continued)

Attribute Name	Type	Context	Description	Comments
DiscoveredTimestamp	TimeStamp	Monitor	When this node was initially discovered.	
EnableProcessTraps	Integer	Monitor	Whether to process traps for this node.	
EnableReportPolling	Integer	Monitor	Whether to enable report polling for this node.	
EnableTrapPolling	Integer	Monitor	Whether to enable trap triggered polling for this node.	
IPAddressInfo	IpAddress Info	Monitor	Information about IP addresses on this node.	This is an attribute group.
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
LastPollTimePeriod	Period	Monitor	How long did the last status poll take.	
LastPollTimestamp	TimeStamp	Monitor	Last Status Poll Timestamp	
Mtp3OffLoad	String	Monitor	Whether MTP3 offload is enabled.	
NSOConfig	String	Monitor	NSO configuration type (75xx and 76xx ITP)	
ParsedVersion	String	Monitor	Device image version parsed from sysdescr	
RFState	String	Monitor	Redundancy State (75xx and 76xx ITP)	
RebootReason	String	Monitor	Reboot Reason	
SerialNumber	String	Monitor	Device Serial number	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimeStamp	TimeStamp	Monitor	Timestamp when the network element state was last changed.	
SysDescr	String	Monitor	sysDescr for Node	
SysName	String	Monitor	sysName for Node	
SysUpTime	Period	Monitor	sysUpTime for Node	
TrapsProcessedManually	Integer	Monitor	Whether trap processing is manually or automatically enabled by the system.	

Table E-17 Network Element: type="Node", subtype="ONS"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AlarmSeverity	String	Monitor	Network element alarm state	
AveragePollTimePeriod	Period	Monitor	Average time for status poll on a node.	
ChassisType	String	Monitor	Chassis type	
ConnectAddress	String	Monitor	IP address and port for terminal connection.	

**Table E-17** Network Element: type="Node", subtype="ONS" (continued)

Attribute Name	Type	Context	Description	Comments
CustomIcon	String	Monitor	Custom icon	
CustomName	String	Monitor	Custom name for node	
DefaultIcon	String	Monitor	Default icon	
DeviceCapabilities	DeviceCapabilities	Monitor	Device capabilities	This is an attribute group.
DeviceType	String	Monitor	Device type	
DiscoveredTimestamp	Timestamp	Monitor	When this node was initially discovered.	
EnableProcessTraps	Integer	Monitor	Whether to process traps for this node.	
EnableReportPolling	Integer	Monitor	Whether to enable report polling for this node.	
EnableTrapPolling	Integer	Monitor	Whether to enable trap triggered polling for this node.	
IPAddressInfo	IpAddressInfo	Monitor	Information about IP addresses on this node.	This is an attribute group.
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
LastPollTimePeriod	Period	Monitor	How long did the last status poll take.	
LastPollTimestamp	Timestamp	Monitor	Last status poll timestamp	
ParsedVersion	String	Monitor	Device image version parsed from sysdescr	
RebootReason	String	Monitor	Reboot reason	
SerialNumber	String	Monitor	Device serial number	
SoftwareRevision	String	Monitor	Software revision	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when network element state was last changed.	
SysDescr	String	Monitor	sysDescr for node	
SysName	String	Monitor	sysName for node	
SysUpTime	Period	Monitor	sysUpTime for node	
TrapsProcessedManually	Integer	Monitor	Whether trap processing is manually or automatically enabled by the system.	

**Table E-18** Network Element: type="Node", subtype="RAN\_SVC"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AcceptableThreshold	Integer	Monitor	Node level acceptable threshold for backhaul traffic.	

Table E-18 Network Element: type="Node", subtype="RAN\_SVC" (continued)

Attribute Name	Type	Context	Description	Comments
AlarmSeverity	String	Monitor	Network element alarm state	
AveragePollTimePeriod	Period	Monitor	Average time for status poll on a node.	
CardType	String	Monitor	Card type	
ConnectAddress	String	Monitor	IP address and port for terminal connection.	
CustomIcon	String	Monitor	Custom icon	
CustomName	String	Monitor	Custom name for node	
DefaultIcon	String	Monitor	Default icon	
Description	String	Monitor	Description	
DeviceCapabilities	DeviceCapabilities	Monitor	Device capabilities	This is an attribute group.
DeviceType	String	Monitor	Device type	
DiscoveredTimestamp	Timestamp	Monitor	When this node was initially discovered.	
EnableProcessTraps	Integer	Monitor	Whether to process traps for this node.	
EnableReportPolling	Integer	Monitor	Whether to enable report polling for this node.	
EnableTrapPolling	Integer	Monitor	Whether to enable trap triggered polling for this node.	
FirmwareRevision	String	Monitor	Firmware revision	
HardwareRevision	String	Monitor	Hardware revision	
IPAddressInfo	IpAddressInfo	Monitor	Information about IP addresses on this node.	This is an attribute group.
IgnoreState	Integer	Monitor	Whether to ignore state of this network element for status aggregation.	
LastPollTimePeriod	Period	Monitor	How long did the last status poll take.	
LastPollTimestamp	Timestamp	Monitor	Last status poll timestamp	
Location	String	Monitor	Location for this RAN_SVC: AggregationSite or CellSite.	
ManufacturerName	String	Monitor	Manufacturer name	
ModelName	String	Monitor	Model name	
OverloadThreshold	Integer	Monitor	Node level overload threshold for backhaul traffic.	
ParsedVersion	String	Monitor	Device image version parsed from sysdescr	
RebootReason	String	Monitor	Reboot reason	
SNMPAccess	String	Monitor	SNMP access method: InBand or OutOfBand.	
SerialNumber	String	Monitor	Device serial number	
Slot	Integer	Monitor	Slot number	

**Table E-18** Network Element: *type="Node", subtype="RAN\_SVC" (continued)*

Attribute Name	Type	Context	Description	Comments
SoftwareRevision	String	Monitor	Software revision	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.	
SysDescr	String	Monitor	sysDescr for node	
SysName	String	Monitor	sysName for node	
SysUpTime	Period	Monitor	sysUpTime for node	
TrapsProcessedManually	Integer	Monitor	Whether trap processing is manually or automatically enabled by the system.	
WarningThreshold	Integer	Monitor	Node level warning threshold for backhaul traffic.	

**Table E-19** Network Element: *type="RBH"*

Attribute Name	Type	Context	Description
RDN	String	All	Relative Distinguished Name
AcceptableThreshold	Integer	Monitor	Acceptable threshold for this backhaul.
AlarmSeverity	String	Monitor	Network element alarm state
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.
IsVirtualBackhaul	Integer	Monitor	Whether this backhaul is a virtual backhaul.
LocalIPAddress	IPAddress	Monitor	Local IP address
OverloadThreshold	Integer	Monitor	Overload threshold for this backhaul.
PeerSerialNumber	String	Monitor	Peer serial number
RemoteIPAddress	IPAddress	Monitor	Remote IP address
State	String	Monitor	Network element state
StateReason	String	Monitor	Network element state reason
StateTimestamp	Timestamp	Monitor	Timestamp when the network element was last changed.
SystemBandwidth	Integer	Monitor	System bandwidth
SystemBandwidthReceive	Integer	Monitor	System receive bandwidth
SystemBandwidthSend	Integer	Monitor	System send bandwidth
UserBandwidth	Integer	Monitor	User bandwidth
UserBandwidthReceive	Integer	Monitor	User receive bandwidth
UserBandwidthSend	Integer	Monitor	User send bandwidth
WarningThreshold	Integer	Monitor	Warning threshold for this backhaul.

Table E-20 Network Element: type="SGMP"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AlarmSeverity	String	Monitor	Network element alarm state	
ConfigLocalAddress	IPAddress	Monitor	Configured local addresses (SCTP)	This attribute is an array.
ConfigLocalInterface	String	Monitor	Configured local interfaces (SCTP)	This attribute is an array.
ConfigLocalPort	Integer	Monitor	Configured local port (SCTP)	
ConfigRemoteAddress	IPAddress	Monitor	Configured remote addresses (SCTP)	This attribute is an array.
ConfigRemotePort	Integer	Monitor	Configured remote port (SCTP)	
CongestionState	String	Monitor	Congestion state	
EffectiveLocalAddress	IPAddress	Monitor	Effective local address (SCTP)	
EffectiveLocalInterface	String	Monitor	Effective local interface name (SCTP)	
EffectiveRemoteAddress	IPAddress	Monitor	Effective remote address (SCTP)	
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
LocalAddress	IPAddress	Monitor	Local address (SCTP)	This attribute is an array.
LocalAddressState	String	Monitor	Local address states (SCTP)	This attribute is an array.
LocalPort	Integer	Monitor	Local port (SCTP)	
PassiveMode	Integer	Monitor	Whether this SGMP association is passive.	
PrimaryRemoteAddress	IPAddress	Monitor	Primary remote address (SCTP)	
QoS	Integer	Monitor	QoS value	
RemoteAddress	IPAddress	Monitor	Remote addresses (SCTP)	This attribute is an array.
RemoteAddressState	String	Monitor	Remote address states (SCTP)	This attribute is an array.
RemotePort	Integer	Monitor	Remote port (SCTP)	
SCTPState	String	Monitor	SCTP state	
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Timestamp	Monitor	Timestamp when the network element state was last changed.	

**Table E-21** Network Element: type="SP"

Attribute Name	Type	Context	Description	Comments
RDN	String	All	Relative Distinguished Name	
AlarmSeverity	String	Monitor	Network element alarm state	
CapabilityPointCode	PointCode	Monitor	Capability point code	This attribute is an array.
CustomIcon	String	Monitor	Custom icon	
CustomName	String	Monitor	Custom name	
DefaultIcon	String	Monitor	Default icon	
Description	String	Monitor	Description	
IgnoreState	Integer	Monitor	Whether to ignore the state of this network element for status aggregation.	
InstanceID	Integer	Monitor	Instance number for this signaling point.	
NetworkIndicator	String	Monitor	Network indicator	
NetworkName	String	Monitor	Network name	
PointCode	PointCode	Monitor	Point code	This attribute is an array.
QOSConfig	QosEntry	Monitor	QoS configurations for this signaling point.	This attribute is an array and an attribute group.
State	String	Monitor	Network element state	
StateReason	String	Monitor	Network element state reason	
StateTimestamp	Tmestamp	Monitor	Timestamp when the network element state was last changed.	
Variant	String	Monitor	Variant	

## Monitor Attribute Groups

The following tables describe the MWTM 6.1 Monitor attribute groups:

- [Attribute Group: "Device Capabilities"](#)
- [Attribute Group: "IpAddressInfo"](#)
- [Attribute Group: "Protection"](#)
- [Attribute Group: "QosEntry"](#)

**Table E-22** Attribute Group: "Device Capabilities"

Attribute Name	Type	Context	Description	Comments
Capability	Object	Monitor	Device capability	This attribute is an array.

**Table E-23** Attribute Group: "IpAddressInfo"

Attribute Name	Type	Context	Description	Comments
Address	IPAddress	Monitor	IP address	This attribute is an array.
LastPolledAddress	IPAddress	Monitor	Last polled IP address	
PollingTimestamp	Timestamp	Monitor	Last polled timestamp for IP address.	This attribute is an array.
PrimaryAddress	IPAddress	Monitor	Primary IP address	
SNMPFlag	Integer	Monitor	SNMP flags for IP address	This attribute is an array.
Status	String	Monitor	IP address status values	This attribute is an array.

**Table E-24** Attribute Group: "Protection"

Attribute Name	Type	Context	Description
ConfiguredState	String	Monitor	Configured protection state
CurrentState	String	Monitor	Current protection state
OtherSlotNum	Integer	Monitor	Other slot number
SlotNum	Integer	Monitor	Slot number

**Table E-25** Attribute Group: "QosEntry"

Attribute Name	Type	Context	Description
DSCPValue	Integer	Monitor	IP DSCP value
QOS	Integer	Monitor	QoS value for signaling point
QOSType	String	Monitor	QoS type: DSCP or TOS
TOSValue	Integer	Monitor	IP TOS value



## MWTM 6.1 Provision Attributes

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The following sections describe the attributes for the MWTM 6.1 Provision feature:

- [CSG2 Provisioning Attributes, page F-1](#)
- [GGSN Provisioning Attributes, page F-14](#)
- [ITP Provisioning Attributes, page F-28](#)
- [RAN Provisioning Attributes, page F-79](#)

### CSG2 Provisioning Attributes

The following sections describe the CSG2 provisioning attributes:

- [Network Element Type: CSG2\\_Billing, page F-1](#)
- [Network Element Type: CSG2\\_Content, page F-2](#)
- [Network Element Type: CSG2\\_Map, page F-6](#)
- [Network Element Type: CSG2\\_Policy, page F-8](#)
- [Network Element Type: CSG2\\_Service, page F-9](#)
- [Network Element Type: Interface, page F-13](#)

### Network Element Type: CSG2\_Billing

**Table F-1**      *Network Element Type: CSG2\_Billing*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-64	Billing Plan Name	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-2** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name
mode	String	Choices: <ul style="list-style-type: none"> <li>prepaid (default)</li> <li>postpaid</li> </ul>	Billing Mode
entiresIdle	Integer	Range: 0-2,147,483,647	Entries User Idle
pod	Boolean		Packet of Disconnect

### AttributeGroup: servicesGroup

**Table F-3** AttributeGroup:servicesGroup

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
services	String		Services	This attribute is an array type.

## Network Element Type: CSG2\_Content

**Table F-4** Network Element Type: "CSG2\_Content"

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-15	Content Name	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-5** Feature: "Basic"

Attribute Name	Type	Restriction(s)	GUI Display Name
inservice	Boolean		In Service
client-group	Combo		Client Group
block	Boolean		Block
vlan	Integer	Range: 1-4094	VLAN Number
pending	Integer	Range: 4-65,535	Pending Timeout

Table F-5 Feature: "Basic"

Attribute Name	Type	Restriction(s)	GUI Display Name
idle	Integer	Range: 4-65,535	Idle Duration
vrf	String		VRF

**AttributeGroup: destination**

Table F-6 AttributeGroup: destination

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
anyIPAddr	Boolean		Any IP Address	
ipAddress	IPAddress		IP Address	Condition: \$Input.Basic.destination && !\$Input.Basic.destination.anyIPAddr
subnetMask	IPAddress	Default Value: 255.255.255.255	Subnet Mask	Condition: \$Input.Basic.destination && !\$Input.Basic.destination.anyIPAddr
protocol	Combo	Choices: <ul style="list-style-type: none"> <li>• any</li> <li>• tcp</li> <li>• udp</li> </ul>	Protocol	
firstPort	Integer	Range: 1-65,535	First Port	Condition: \$Input.Basic.destination && \$Input.Basic.destination.protocol && ( \$Input.Basic.destination.protocol == "tcp"    \$Input.Basic.destination.protocol == "udp" )
lastPort	Integer	Range: 1-65,535	Last Port	Condition: \$Input.Basic.destination && \$Input.Basic.destination.protocol && ( \$Input.Basic.destination.protocol == "tcp"    \$Input.Basic.destination.protocol == "udp" )

**AttributeGroup: policyMappingGroup**

Table F-7 AttributeGroup: policyMappingGroup

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
policyMapping	String		Policy Mapping	This attribute is required
policyMappingPriority	Integer	Range: 1-65,535	Policy Mapping Priority	Condition: CSG2 R2 and above only

**AttributeGroup: parseGroup****Table F-8** *AttributeGroup: parseGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
parseProtocol	String	Choices: <ul style="list-style-type: none"> <li>• http</li> <li>• imap</li> <li>• other</li> <li>• pop3</li> <li>• rtsp</li> <li>• smtp</li> <li>• wap</li> </ul>	Parse Protocol	
connectionOriented	Boolean		Connection Oriented	Condition: \$Input.Basic.parseGroup && \$Input.Basic.parseGroup.parseP rotocol && \$Input.Basic.parseGroup.parseP rotocol == "wap"
parseLength	Integer	Range: 1-65535	Parse Length	

**AttributeGroup: cdrRecordsGroup****Table F-9** *AttributeGroup: cdrRecordsGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
recordsDelay	Integer	Range: 0-1,234	CDR Records Delay	
recordsIntermediateBytes	Integer	Range: 5000-4,294,967,295	CDR Records Intermediate Bytes	Condition: !\$Input.Basic.parseGroup    !\$Input.Basic.parseGroup.parseProt ocol    (\$Input.Basic.parseGroup && \$Input.Basic.parseGroup.parseProt ocol && \$Input.Basic.parseGroup.parseProt ocol != "imap" && \$Input.Basic.parseGroup.parseProt ocol != "pop3" && \$Input.Basic.parseGroup.parseProt ocol != "smtp" )

**Table F-9** *AttributeGroup: cdrRecordsGroup (continued)*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
recordsIntermediateSeconds	Integer	Range: 5-86,400	CDR Records Intermediate Seconds	Condition: !\$Input.Basic.parseGroup    !\$Input.Basic.parseGroup.parseProtocol    (\$Input.Basic.parseGroup && \$Input.Basic.parseGroup.parseProtocol && \$Input.Basic.parseGroup.parseProtocol != "imap" && \$Input.Basic.parseGroup.parseProtocol != "pop3" && \$Input.Basic.parseGroup.parseProtocol != "smtp" )

**AttributeGroup: replication****Table F-10** *AttributeGroup: replication*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
replicate	Boolean		Replicate	
replicateDelay	Integer	Range: 1-3,600	Delay	Condition: \$Input.Basic.replication.replicate

**AttributeGroup: nextHopGroup****Table F-11** *AttributeGroup: nextHopGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
nextHop	IPAddress		Next Hop IP Address	
nextHopReverse	IPAddress		Next Hop Reverse IP Address	
nextHopSubscriberMedia	IPAddress		Next Hop Subscriber Media IP Address	Condition: CSG2 R2 and above only

**AttributeGroup: xForwardedGroup****Table F-12** AttributeGroup: xForwardedGroup

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
xForwarded	Boolean		Subscriber IP From X-Forwarded-For header	Condition: \$Input.Basic.parseGroup && \$Input.Basic.parseGroup.parseProtocol && \$Input.Basic.parseGroup.parseProtocol == "http"
xForwardedObscure	Boolean		Obscure	Condition: \$Input.Basic.xForwardedGroup.xForwarded

**Network Element Type: CSG2\_Map****Table F-13** Network Element Type: CSG2\_Map

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-15	Map Name	This attribute is required and is not modifiable.

**Feature: Basic****Note**


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This feature is required.

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## Feature: MatchStatements

### AttributeGroup: matchHeader


**Note**

- Condition: !(\$Input.MatchStatements.matchMethod) && !(\$Input.MatchStatements.matchURL)
- This attribute group is an array type.

**Table F-14** *AttributeGroup: matchHeader*

Attribute Name	Type	Restriction(s)	GUI Display Name
HeaderName	Combo	Length: 0-63 Choices: <ul style="list-style-type: none"> <li>• Content-Type</li> <li>• Host</li> <li>• Referrer</li> <li>• User-Agent</li> </ul>	Header
HeaderValue	String	Length: 0-127	Header Value

### AttributeGroup: matchMethod


**Note**

- Condition: !(\$Input.MatchStatements.matchHeader) && !(\$Input.MatchStatements.matchURL)
- This attribute group is an array type.

**Table F-15** *AttributeGroup: matchMethod*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MethodName	Combo	Length: 0-15 Choices: <ul style="list-style-type: none"> <li>• CONNECT</li> <li>• GET</li> <li>• HEAD</li> <li>• POST</li> </ul>	Method Name	This attribute is required.

**AttributeGroup: matchURL****Note**

- Condition: !(\$Input.MatchStatements.matchHeader) && !(\$Input.MatchStatements.matchMethod)
- This attribute group is an array type.

**Table F-16** *AttributeGroup: matchURL*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
URL	String	Length: 0-127	URL	This attribute is required.

**Network Element Type: CSG2\_Policy****Table F-17** *Network Element Type: CSG2\_Policy*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-15	Policy Name	This attribute is required and is not modifiable.

**Feature: Basic****Note**

This feature is required.

**AttributeGroup: Accounting****Table F-18** *AttributeGroup: Accounting*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
accounting	Boolean		Accounting	
customerString	String	Length: 1-16	Customer String	Condition: \$Input.Basic.Accounting.accounting

**AttributeGroup: HeaderMap****Table F-19** *AttributeGroup: HeaderMap*

Attribute Name	Type	Restriction(s)	GUI Display Name
headerMap	String		Header Map

**AttributeGroup: MethodMap****Table F-20** *AttributeGroup: MethodMap*

Attribute Name	Type	Restriction(s)	GUI Display Name
methodMap	String		Method Map

**AttributeGroup: UriMap****Table F-21** *AttributeGroup: UriMap*

Attribute Name	Type	Restriction(s)	GUI Display Name
urlMap	String		URL Map

**Network Element Type: CSG2\_Service****Table F-22** *Network Element Type: CSG2\_Service*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-16	Service Name	This attribute is required and is not modifiable.

**Feature: Basic****Note**

This feature is required.

**Table F-23** *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Basis	Combo	Choices: <ul style="list-style-type: none"> <li>byte ip (default)</li> <li>byte tcp</li> <li>fixed</li> <li>second</li> <li>second connect</li> </ul>	Billing Basis	
activationType	String	Choices: <ul style="list-style-type: none"> <li>automatic</li> <li>user-profile (default)</li> </ul>	Activation	Condition: \$Input.Basic.Basis && \$Input.Basic.Basis == "second connect"
classValue	Integer	Range: 1-255	Class	
idle	Integer	Range: 1-65,535	Idle	Condition: \$Input.Basic.Basis && \$Input.Basic.Basis != "second connect"

Table F-23 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
passthrough	Integer	Range: 1-2,147,483,647	Passthrough	
refundPolicy	String		Refund Policy	Condition: \$Input.Basic.Basis && \$Input.Basic.Basis != "second" && \$Input.Basic.Basis != "second connect"

**AttributeGroup: AOC****Note**

Condition: \$Input.Basic.Basis && \$Input.Basic.Basis != "second connect"

Table F-24 AttributeGroup:AOC

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
aocEnabled	Boolean		Enable AoC	
aocAppendUrl	Boolean		AoC Append URL	Condition: \$Input.Basic.AOC && \$Input.Basic.AOC.aocEnabled && \$Input.Basic.AOC.aocEnabled == "true"
aocConfirmToken	String	Length: 1-15	AoC Confirm	Condition: \$Input.Basic.AOC && \$Input.Basic.AOC.aocEnabled && \$Input.Basic.AOC.aocEnabled == "true"

**AttributeGroup: Owner**

Table F-25 AttributeGroup:Owner

Attribute Name	Type	Restriction(s)	GUI Display Name
ownerName	String	Length: 1-38	Owner Name
ownerId	String	Length: 1-15	Owner ID

**AttributeGroup: VerificationGroup**

**Note** Condition: \$Input.Basic.Basis && \$Input.Basic.Basis != "second connect"

**Table F-26** *AttributeGroup:VerificationGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
verify	Boolean		Verify	
verifyToken	String	Length: 1-15	Verify Confirm Token	Condition: \$Input.Basic.VerificationGroup && \$Input.Basic.VerificationGroup.verify && \$Input.Basic.VerificationGroup.verify == "true"

**AttributeGroup: Metering****Table F-27** *AttributeGroup:Metering*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
excludeMmsWap	Boolean		Exclude mms wap	Condition: \$Input.Basic.Basis && ( \$Input.Basic.Basis == "byte ip"    \$Input.Basic.Basis == "fixed" )
excludePauseRtsp	Boolean		Exclude pause rtsp	Condition: \$Input.Basic.Basis && \$Input.Basic.Basis == "second"
excludeSvcIdle	Boolean		Exclude svc-idle	Condition: \$Input.Basic.Basis && \$Input.Basic.Basis == "second"
excludeControlSip	Boolean		Exclude control sip	Condition: CSG2 R2 and above only
excludeNetworkInitSip	Boolean		Exclude network-init sip	Condition: CSG2 R2 and above only
includeImapBody	String	Choices: <ul style="list-style-type: none"> <li>header</li> <li>only</li> <li>other</li> </ul>	Include imap body	Condition: \$Input.Basic.Basis && ( \$Input.Basic.Basis == "byte ip"    \$Input.Basic.Basis == "byte tcp" )
increment	Integer	Range: 1-65535	Increment	Condition: \$Input.Basic.Basis && \$Input.Basic.Basis == "second"    \$Input.Basic.Basis == "second connect"

Table F-27 *AttributeGroup: Metering (continued)*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
initial	Integer	Range: 0-65,535	Initial	Condition: \$Input.Basic.Basis && \$Input.Basic.Basis == "second"    \$Input.Basic.Basis == "second connect"
minimum	Integer	Range: 1-65,535	Minimum	Condition: \$Input.Basic.Basis && \$Input.Basic.Basis == "second"    \$Input.Basic.Basis == "second connect"

**AttributeGroup: ReauthorizationGroup**Table F-28 *AttributeGroup: ReauthorizationGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name
reauthThreshold	Integer	Range: 0-10,000,000 Default Value: 10,000,000	Reauthorization Threshold
reauthTimeoutInitial	Integer	Range: 1-3,600 Default Value: 4	Reauthorization Timeout Initial
reauthTimeoutMax	Integer	Range: 1-3,600 Default Value: 60	Reauthorization Timeout Maximum

**AttributeGroup: RecordsGroup**Table F-29 *AttributeGroup: RecordsGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
granularity	String	Choices: <ul style="list-style-type: none"> <li>transaction</li> <li>service</li> </ul>	Records Granularity	
bytes	Integer	Range: 5000-2,147,483,647	Bytes	Condition: \$Input.Basic.RecordsGroup && \$Input.Basic.RecordsGroup && \$Input.Basic.RecordsGroup.granularity && \$Input.Basic.RecordsGroup.granularity == "service"
seconds	Integer	Range: 5-86,400	Seconds	Condition: \$Input.Basic.RecordsGroup && \$Input.Basic.RecordsGroup && \$Input.Basic.RecordsGroup.granularity && \$Input.Basic.RecordsGroup.granularity == "service"

**AttributeGroup: ContentGroups****Table F-30** *AttributeGroup:ContentGroups*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
contentName	String		Content	This attribute is required.
policyName	String		Policy	This attribute is required.
weight	Integer	<ul style="list-style-type: none"> <li>Range: 0-32,767</li> <li>Default value: 1</li> </ul>	Weight	Condition: \$Input.Basic.Basis && \$Input.Basic.Basis != "second"

**Network Element Type: Interface****Table F-31** *Network Element Type: Interface*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

**Feature: Basic****Note**

This feature is required.

**Table F-32** *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name
IPAddress	IPAddress		IPAddress
IPSubnetMask	IPAddress		IPSubnetMask
Shutdown	Boolean		Shutdown

# GGSN Provisioning Attributes

The following sections describe the GGSN provisioning attributes:

- Network Element Type: APN, page F-14
- Network Element Type: GPRS\_Charging\_Profile, page F-20
- Network Element Type: Interface SubType: FastEthernet, page F-21
- Network Element Type: Interface SubType: GigabitEthernet, page F-22
- Network Element Type: Interface SubType: Loopback, page F-23
- Network Element Type: Interface SubType: L2Vlan, page F-24
- Network Element Type: Interface SubType: Tunnel, page F-24
- Network Element Type: Interface SubType: VLAN, page F-25
- Network Element Type: Node, page F-26
- Network Element Type: VRF, page F-27

## Network Element Type: APN



Condition: GGSN Only

**Table F-33** Network Element Type: APN

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-99	Access Point Name	This attribute is required and is not modifiable.

## Feature: Basic



This feature is required.

**Table F-34** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
index	Integer		APN Index	This attribute is required and is not modifiable.
ServiceMode	String	Choices: <ul style="list-style-type: none"> <li>• operational (default)</li> <li>• maintenance</li> </ul>	Service Mode	
ServiceAware	Boolean		Service Aware	
ServicePolicy	String		Service Policy	
VRFName	String		VRF Name	

Table F-34 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
AccessMode	String	Choices: <ul style="list-style-type: none"> <li>transparent (default)</li> <li>non-transparent</li> </ul>	Access Mode	
accessType	String	Choices: <ul style="list-style-type: none"> <li>real (default)</li> <li>virtual</li> <li>virtual pre-authenticate</li> </ul>	Access Type	
defaultAPN	String		Default APN	Condition: \$Input.Basic.accessType && \$Input.Basic.accessType == "virtual pre-authenticate"
violationDeactivatePDP	Boolean		Deactivate PDP Context On Violation	
advertiseDownlinkNexthop	IPAddress		Advertise Downlink nexthop	
AccessGroupIn	String		IP Access Group In	
AccessGroupOut	String		IP Access Group Out	
NetworkBehindMobile	Boolean		Network Behind Mobile	
NetworkRequestActivation	Boolean		Network Request Activation	
PCSCF	String		PCSCF	
SessionIdleTime	Integer	Range: 1-168	Session Idle Time	
SubscriptionRequired	Boolean		Subscription Required	
BlockForeignMS	Boolean		Block Foreign MS	
CacPolicy	String		Call Admission Control (CAC) Policy	

**AttributeGroup: Redirect**

Table F-35 AttributeGroup:Redirect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RedirectAllIpAddress	IPAddress		Redirect All IP Addresses	
RedirectIntermobileIpAddress	IPAddress		Redirect Intermobile IP Addresses	

**AttributeGroup: AAAGroup****Table F-36** *AttributeGroup:AAAGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
accountingEnabled	Boolean		Accounting Enabled	
interimUpdateEnabled	Boolean		Interim Update Enabled	Condition: \$Input.Basic.AAAGroup.accountingEnabled
updatePeriod	String		Interim Update Period	
AAAGroupAccounting	String		AAA Accounting Group Name	
AAAGroupAuthentication	String		AAA Authentication Group Name	

**AttributeGroup: AnonUser****Table F-37** *AttributeGroup:AnonUser*

Attribute Name	Type	Restriction(s)	GUI Display Name
AnonymousUserName	String		Anonymous User Name
AnonymousUserPassword	String		Anonymous User Password

**AttributeGroup: DHCPGroup****Table F-38** *AttributeGroup:DHCPGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
DHCPGatewayAddress	IPAddress		DHCP Gateway Address	
DHCPServerPrimary	IPAddress		Primary DHCP Server	
DHCPServerSecondary	IPAddress		Secondary DHCP Server	
DHCPServerVRF	Boolean		DHCP Server VRF	

**AttributeGroup: DNSGroup****Table F-39** *AttributeGroup:DNSGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
DNSPrimary	IPAddress		Primary DNS	
DNSSecondary	IPAddress		Secondary DNS	

**AttributeGroup: GTPGroup****Table F-40** *AttributeGroup:GTPGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
GTPPDPContextTimeoutIdleInterval	Integer	Range: 30 - 4,294,967	GTP PDP Context Timeout Idle Interval	
GTPPDPContextIdleUplink	Boolean		GTP PDP Context Timeout Idle Uplink	
GTPPDPContextTimeoutSession	Integer	Range: 30 - 4,294,967	GTP PDP Context Timeout Session	
GTPSinglePdpSession	Boolean		GTP Single PDP Session	
GTPSinglePdpSessionMandatory	Boolean		GTP Single PDP Session Mandatory	Condition: \$Input.Basic.GTPGroup.GTPSinglePdpSession
GTPResponseMessageWaitAccounting	Boolean		GTP Response Message Wait Accounting	
GTPUpdateQosFailDelete	Boolean		GTP Update qos-fail Delete	

**AttributeGroup: IPProbe****Table F-41** *AttributeGroup:IPProbe*

Attribute Name	Type	Restriction(s)	GUI Display Name
IPAddr	IPAddress		IP Address
Port	Integer	Range: 1-65,535	Port
TTL	Integer	Range: 1-255	TTL

**AttributeGroup: IpAddressPool****Table F-42** *AttributeGroup:IpAddressPool*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
IpAddressPoolType	String	Choices: <ul style="list-style-type: none"> <li>• dhcp-proxy-client</li> <li>• disable</li> <li>• local</li> <li>• radius-client</li> </ul>	IP Address Pool Type	
IpAddressPoolLocal	String		IP Local Pool Name	Condition: \$Input.Basic.IpAddressPool && \$Input.Basic.IpAddressPool.IpAddressPoolType && \$Input.Basic.IpAddressPool.IpAddressPoolType == "local"

**AttributeGroup: MSISDN****Table F-43** *AttributeGroup:MSISDN*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Suppression	Boolean		Suppression	
ISDN	String		ISDN	Condition: \$Input.Basic.MSISDN.Suppression

**AttributeGroup: NBNS****Table F-44** *AttributeGroup:NBNS*

Attribute Name	Type	Restriction(s)	GUI Display Name
primary	IPAddress		Primary Address
secondary	IPAddress		Secondary Address

**AttributeGroup: RadiusAttributes****Table F-45** *AttributeGroup:RadiusAttributes*

Attribute Name	Type	Restriction(s)	GUI Display Name
AcctSessIdChargingId	Boolean		Include acct-session-id and charging-id only
SuppressImsi	Boolean		Suppress IMSI
SuppressQos	Boolean		Suppress QoS Profile
SuppressSgsnAddress	Boolean		Suppress SGSN Address

**Table F-45** *AttributeGroup:RadiusAttributes (continued) (continued)*

Attribute Name	Type	Restriction(s)	GUI Display Name
UserNameMsisdn	Boolean		Include MSISDN in User Name
NasId	String		Include NAS Identifier

**AttributeGroup: Security****Table F-46** *AttributeGroup:Security*

Attribute Name	Type	Restriction(s)	GUI Display Name
verifyDestination	Boolean		Verify Destination
verifySource	Boolean		Verify Source

**AttributeGroup: BandwidthPool****Table F-47** *AttributeGroup:BandwidthPool*

Attribute Name	Type	Restriction(s)	GUI Display Name
input	String		Input Pool
output	String		Output Pool

**AttributeGroup: ChargingProfiles****Table F-48** *AttributeGroup:ChargingProfiles*

Attribute Name	Type	Restriction(s)	GUI Display Name
AnyProfile	String		Any
AnyProfileOverride	Boolean		Override Any
HomeProfile	String		Home
HomeProfileOverride	Boolean		Override Home
RoamingProfile	String		Roaming
RoamingProfileOverride	Boolean		Override Roaming
RoamingTrustedProfile	String		Roaming Trusted
RoamingTrustedProfileOverride	Boolean		Override Roaming Trusted
VisitingProfile	String		Visiting
VisitingProfileOverride	Boolean		Override Visiting
VisitingTrustedProfile	String		Visiting Trusted
VisitingTrustedProfileOverride	Boolean		Override Visiting Trusted

**AttributeGroup: PPPRegen****Table F-49** *AttributeGroup:PPPRegen*

Attribute Name	Type	Restriction(s)	GUI Display Name
maxSession	Integer	Range: 1-65,535	Max Sessions
setupTime	Integer	Range: 1-65,535	Setup Time
domainType	Combo	Choices: <ul style="list-style-type: none"> <li>fixed-domain</li> <li>verify-domain</li> </ul>	Domain Type
allowDuplicate	Boolean		Allow Duplicate

**Feature: Aggregates****Table F-50** *Feature: Aggregates*

Attribute Name	Type	Restriction(s)	GUI Display Name
aggregateAuto	Boolean		Aggregate Auto

**AttributeGroup: aggregateNetworkGroup****Note**

- Condition: !\$Input.Aggregates.aggregateAuto
- This attribute group is an array type.

**Table F-51** *AttributeGroup:aggregateNetworkGroup*

Attribute Name	Type	Restriction(s)	GUI Display Name
aggregateIpNetworkPrefix	IPAddress		Aggregate IP network Prefix
aggregateIpNetworkMask	IPAddress		Aggregate IP network Mask

**Network Element Type: GPRS\_Charging\_Profile****Note**

Condition: GGSN Only

**Table F-52** *Network Element Type: GPRS\_Charging\_Profile*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Range: 1-255	Number	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-53**      *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Category	Choice	Choices: <ul style="list-style-type: none"> <li>flat</li> <li>hot</li> <li>normal (default)</li> <li>prepaid</li> </ul>	Category	
CdrSuppression	Boolean		CDR Suppression	
CdrSuppressionPrepaid	Boolean		CDR Suppression Prepaid	Condition: \$Input.Basic.CdrSuppression
DCCAProfile	String		DCCA Profile	
PostpaidPlmnChange	Boolean		Postpaid PLMN Change	
PostpaidQosChange	Boolean		Postpaid QoS Change	
PostpaidRatChange	Boolean		Postpaid RAT Change	
PostpaidSgsnChange	Boolean		Postpaid SGSN Change	
PostpaidTime	Integer	Range: 300-4,294,967,295	Postpaid Time	
PostpaidValidity	Integer	Range: 900-4,294,967,295	Postpaid Validity	
PostpaidVolume	Integer	Range: 1-4,294,967,295	Postpaid Volume	
Rulebase	String	Length: 1-16	Rulebase	
LimitDuration	Integer	Range: 5-4,294,967,295	Limit Duration	
LimitDurationReset	Boolean		Limit Duration Reset	
LimitSgsnChange	Integer	Range: 0-15	Limit SGSN Change	
LimitVolume	Integer	Range: 1-4,294,967,295	Limit Volume	
LimitVolumeReset	Boolean		Limit Volume Reset	
TariffTime	Boolean		Tariff Time	

## Network Element Type: Interface SubType: FastEthernet

**Table F-54**      *Network Element Type: Interface SubType: FastEthernet*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

**Feature: Basic****Note**

This feature is required.

**Table F-55**      **Feature: Basic**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Description	String	Length: 0-242	Interface Description	
Speed	String	Choices: <ul style="list-style-type: none"> <li>• auto (default)</li> <li>• 10</li> <li>• 100</li> </ul>	Speed	Condition: \$DeviceType.startsWith("Cisco76")
Duplex	String	Choices: <ul style="list-style-type: none"> <li>• full</li> <li>• half</li> </ul>	Duplex	Condition: \$DeviceType.startsWith("Cisco76") && \$Input.Basic.Speed != "auto"
IPAddress	IPAddress		IPAddress	
IPSubnetMask	IPAddress		IPSubnetMask	
Shutdown	Boolean		Shutdown	

**Network Element Type: Interface SubType: GigabitEthernet****Table F-56**      **Network Element Type: Interface SubType: GigabitEthernet**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

**Feature: Basic****Note**

This feature is required.

**Table F-57** *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Description	String	Length: 0-242	Interface Description	
Speed	String	Choices: <ul style="list-style-type: none"> <li>• 10</li> <li>• 100</li> <li>• 1000</li> <li>• auto (default)</li> <li>• nonegotiate</li> </ul>	Speed	Condition: \$DeviceType.startsWith("Cisco76")
Duplex	String	Choices: <ul style="list-style-type: none"> <li>• full</li> <li>• half</li> </ul>	Duplex	Condition: \$DeviceType.startsWith("Cisco76") && \$Input.Basic.Speed && \$Input.Basic.Speed != "nonegotiate"
IPAddress	IPAddress		IPAddress	
IPSubnetMask	IPAddress		IPSubnetMask	
Shutdown	Boolean		Shutdown	

**Network Element Type: Interface SubType: Loopback****Table F-58** *Network Element Type: Interface SubType: Loopback*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

**Feature: Basic****Note**

This feature is required.

**Table F-59** *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name
IPAddress	IPAddress		IPAddress
IPSubnetMask	IPAddress		IPSubnetMask

Table F-59 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name
Shutdown	Boolean		Shutdown
Description	String	Length: 0-242	Interface Description

## Network Element Type: Interface SubType: L2Vlan

**Note**

Condition: VLAN Interface - No GGSN, only Supervisor

Table F-60 Network Element Type: Interface SubType: L2Vlan

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Range: 1-4,094	Layer 2 Vlan Number	This attribute is required and is not modifiable.

### Feature: Basic

This feature is required.

Table F-61 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name
name	String	Length: 0-20	Name

## Network Element Type: Interface SubType: Tunnel

Table F-62 Network Element Type: Interface SubType: Tunnel

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

### Feature: Basic

**Note**

This feature is required.

Table F-63 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name
IPAddress	IPAddress		IPAddress
IPSubnetMask	IPAddress		IPSubnetMask

Table F-63 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name
Shutdown	Boolean		Shutdown
Description	String	Length: 0-242	Interface Description

## Network Element Type: Interface SubType: VLAN



**Note** Condition: VLAN Interface - No GGSN, only Supervisor

Table F-64 Network Element Type: Interface SubType: VLAN

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		VLAN Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

Table F-65 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description
IPAddress	IPAddress		IPAddress
IPSubnetMask	IPAddress		IPSubnetMask
Shutdown	Boolean	Default: True	Shutdown
vrfForwarding	String		VRF Forwarding
accessGroupIn	Combo		Access Group IN
accessGroupOut	Combo		Access Group OUT
ipRedirects	Boolean	Default: True	IP Redirects
ipUnreachables	Boolean	Default: True	IP Unreachables
arpTimeout	Integer	Range: 0-2,147,483	ARP Timeout
ipProxyArp	Boolean	Default: True	Proxy ARP

## Network Element Type: Node



**Note** Condition: GGSN R8 and above

**Table F-66** Network Element Type: Node

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Node Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

### Feature: GPRS\_Global



**Note** This feature is required.

**Table F-67** Feature: GPRS\_Global

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
APN_List	String		APN List	This attribute is not modifiable.
serviceMode	Choice	Choices: <ul style="list-style-type: none"> <li>• maintenance</li> <li>• operational (default)</li> </ul>	Service Mode	
testImsi	String		Test by IMSI	
maxPdpContextAllowed	Integer	Range: 1-4,294,967,295	Max PDP Contexts Allowed	
qosDefaultResponseRequested	Boolean		QoS Default Response Requested	

### Feature: GPRS\_Charging\_Profile\_Defaults

**Table F-68** Feature: GPRS\_Charging\_Profile\_Defaults

Attribute Name	Type	Restriction(s)	GUI Display Name
Any	String	Range: 1-255	Default Profile Any
AnyOverride	Boolean		Any Override
Home	String	Range: 1-255	Default Profile Home

**Table F-68** Feature: *GPRS\_Charging\_Profile\_Defaults (continued)*

Attribute Name	Type	Restriction(s)	GUI Display Name
HomeOverride	Boolean		Home Override
Roaming	String	Range: 1-255	Default Profile Roaming
RoamingOverride	Boolean		Default Profile Roaming
RoamingTrusted	String	Range: 1-255	RoamingTrusted Override
RoamingTrustedOverride	Boolean		RoamingTrusted Override
Visiting	String	Range: 1-255	Visiting
VisitingOverride	Boolean		Visiting Override
VisitingTrusted	String	Range: 1-255	Default Profile VisitingTrusted
VisitingTrustedOverride	Boolean		VisitingTrusted Override

## Network Element Type: VRF

**Table F-69** Network Element Type: *VRF*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		VRF Name	This attribute is required and is not modifiable.

### Feature: Basic

**Note**

This feature is required.

**Table F-70** Feature: *Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name
routeDistinguisher	String		Route Distinguisher
Description	String		Description

# ITP Provisioning Attributes

The following sections describe the ITP attributes:

- [Network Element Type: AS, page F-28](#)
- [Network Element Type: ASP, page F-31](#)
- [Network Element Type: Interface, SubType: ATM, page F-34](#)
- [Network Element Type: Interface, SubType: Ethernet, page F-34](#)
- [Network Element Type: Interface, SubType: E1, page F-35](#)
- [Network Element Type: Interface, SubType: FastEthernet, page F-37](#)
- [Network Element Type: Interface, SubType: GigabitEthernet, page F-37](#)
- [Network Element Type: Interface SubType: Serial, page F-39](#)
- [Network Element Type: Interface, SubType: Serial, page F-39](#)
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- [Network Element Type: M3UA, page F-64](#)
- [Network Element Type: Profile, page F-66](#)
- [Network Element Type: SAMI, page F-75](#)
- [Network Element Type: SUA, page F-76](#)

## Network Element Type: AS

**Table F-71**      *Network Element Type: AS*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-12	Name	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-72**      *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	Choices: <ul style="list-style-type: none"> <li>m3ua (default)</li> <li>sua</li> </ul>	AS Type	This attribute is required and is not modifiable.
TrafficMode	String	Choices: <ul style="list-style-type: none"> <li>broadcast</li> <li>override</li> <li>loadshare</li> </ul>	Traffic Mode	
LoadshareType	String	Choices: <ul style="list-style-type: none"> <li>bindings (default)</li> <li>roundrobin</li> </ul>	Loadshare Type	Condition: \$Input.Basic.TrafficMode && \$Input.Basic.TrafficMode == "loadshare"
RoutingContext	Integer	Range: 1-4,294,967,295	Routing Context	This attribute is required and is not modifiable.
GTT	Boolean		Global Title Translation	This attribute is not modifiable.
DPC	PointCode		Destination Point Code	Condition: !\$Input.Basic.GTT This attribute is required and is not modifiable.
OPC	PointCode		Originating Point Code	Condition: !\$Input.Basic.GTT This attribute is not modifiable.
OPCMask	PointCode		Point Code Mask	Condition: !\$Input.Basic.GTT This attribute is not modifiable.

Table F-72 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SIType	String	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Type &amp;&amp; \$Input.Basic.Type == "m3ua"</li> <li>Choices: <ul style="list-style-type: none"> <li>- bicc</li> <li>- isup</li> <li>- sccp</li> <li>- tup</li> </ul> </li> <li>Condition" \$Input.Basic.Type &amp;&amp; \$Input.Basic.Type == "sua"</li> <li>Choices: <ul style="list-style-type: none"> <li>- sccp</li> </ul> </li> </ul>	SI Sub Types	Condition: !\$Input.Basic.GTT This attribute is required and is not modifiable.
CICMin	Integer	Range: 0-4,294,967,295	Minimum Circuit Identification Code (CIC)	Condition: !\$Input.Basic.GTT && \$Input.Basic.SIType && \$Input.Basic.SIType != "" && \$Input.Basic.SIType != "sccp" This attribute is not modifiable.
CICMax	Integer	Range: 0-4,294,967,295	Minimum Circuit Identification Code (CIC)	Condition: !\$Input.Basic.GTT && \$Input.Basic.SIType && \$Input.Basic.SIType != "" && \$Input.Basic.SIType != "sccp" This attribute is not modifiable.
SSN	Integer	Range: 2-255	Subsystem Number Value	Condition: !\$Input.Basic.GTT && \$Input.Basic.Type && \$Input.Basic.Type == "sua" This attribute is not modifiable.

**AttributeGroup: ASP**

**Note** This attribute group is an array and is required.

**Table F-73** *AttributeGroup: ASP*

Attribute Name	Type	Restriction(s)	GUI Display Name
ASPName	String	Length: 1-19	ASP Name
Weight	Integer	Range: 0-10	ASP Weight

**Feature: ASPParams****Table F-74** *Feature ASPParams*

Attribute Name	Type	Restriction(s)	GUI Display Name
BurstTimeout	Integer	Range: 1,000-10,000	Burst Recovery Timeout (in ms)
RecoveryTimeout	Integer	Range: 0-2,000	Recovery Timeout (in ms)
NetworkAppearance	Integer	Range: 0-4,294,967,295	Network Appearance
MinAcxtive ASPs	Integer	Range: 0-4,294,967,295	Minimum Active ASP Target
QoSClass	Integer	Range: 1-7	QoS Class ID

**Network Element Type: ASP****Table F-75** *Network Element Type: ASP*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-12	Name	This attribute is required and is not modifiable.

**Feature: Basic**

**Note** This feature is required.

**Table F-76** *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	Choices: <ul style="list-style-type: none"> <li>m3ua (default)</li> <li>sua</li> </ul>	ASP Type	This attribute is required and is not modifiable.
LocalPort	Integer	Range: 1024-65,535	Local Port Number	This attribute is required and is not modifiable.

Table F-76 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RemotePort	Integer	Range: 0-65,535	Remote Port Number	This attribute is required and is not modifiable.
RemoteIP	IPAddress		Remote IP Address	This attribute is required and is an array type (size limit is 4).

**Feature: Block**

Table F-77 Feature: Block

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
BlockASP	Boolean	Default Value: False	Block ASP	This attribute is required.

**Feature: SCTPParams**

Table F-78 Feature: SCTPParams

Attribute Name	Type	Restriction(s)	GUI Display Name
MaxAssocRetransmits	Integer	Range: 2-20	Maximum Association Retransmissions
BundlingInterval	Integer	Range: 5-1,000	Bundling Interval Value (in ms)
CumulativeSackValue	Integer	Range: 100-500	Cumulative Sack Value (in ms)
FastRate	Integer	Range: 0-100 Default Value: 50	Fast CWND Decrease Rate
IdleRate	Integer	Range: 0-100 Default Value: 50	Idle CWND Decrease Rate
InitSize	Integer	Range: 3000-20,971,520 Default Value: 3,000	Initial CWND Size (in bytes)
RetransRate	Integer	Range: 0-100 Default Value: 50	Retransmit CWND Rate
SCTPRetransmit	Boolean	Default Value: False	SCTP Fast Retransmit
KeepAliveInterval	Integer	Range: 300-3,000	Keepalive Interval Value (in ms)
MaxPathRetransmits	Integer	Range: 2-10	Maximum Path Retries
RTOMinValue	Integer	Range: 100-60,000	Retransmission Minimum RTO Value (in ms)
RTOMaxValue	Integer	Range: 100-60,000	Retransmission Minimum RTO Value (in ms)
TxDepthValue	Integer	Range: 100-20,000	Transmit Queue Depth Value

## Feature: QoS

**Table F-79** Feature: QoS

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
QoSClass	Integer	Range: 1-7	QoS Class ID	Condition: \$Node.MultiInstance This Attribute is required if (\$Input.QoS.QoSClass)
Instance	Integer	Range: 0-7	Instance Number	

### AttributeGroup: MatchSI



**Note**

- Condition: !(\$Input.QoS.MatchAny) && (\$Input.Basic.Type == "m3ua")
- This attribute group is an array.

**Table F-80** AttributeGroup: MatchSI

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SI	Integer	Range: 0-15 Default value: 0	SI	This attribute is required.
Instance	Integer	Range: 0-7	Instance Number	Condition: \$Node.MultiInstance This attribute is required.
QoSClass	Integer	Range: 1-7	QoS Class ID	This attribute is required.

### AttributeGroup: MatchAny



**Note**

Condition: !(\$Input.QoS.MatchSI)

**Table F-81** AttributeGroup: MatchAny"

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Instance	Integer	Range: 0-7	Instance Number	Condition: \$Node.MultiInstance This attribute is required.
QoSClass	Integer	Range: 1-7	QoS Class ID	This attribute is required.

## Network Element Type: Interface, SubType: ATM

**Table F-82** Network Element Type: Interface, SubType: ATM

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note**

This feature is required.

**Table F-83** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
ATMNNI	Boolean		ATM NNI	This attribute is required.
QSAAL	Boolean		Enable QSAAL PVC	This attribute is required.
VPI	Integer	Range: 0-255	VPI	Condition: \$Input.Basic.QSAAL This attribute is required.
VCI	Integer	Range: 1-65,535	VCI	Condition: \$Input.Basic.QSAAL This attribute is required.
Shutdown	Boolean		Shutdown	

## Network Element Type: Interface, SubType: Ethernet

**Table F-84** Network Element Type: Interface, SubType: Ethernet

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

**Feature: Basic****Note**

This feature is required.

**Table F-85** *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name
Duplex	String	Choices: <ul style="list-style-type: none"> <li>full</li> <li>half</li> </ul>	Duplex
IPAddress	IPAddress		IPAddress
IPSubnetMask	IPAddress		IPSubnetMask
Shutdown	Boolean		Shutdown

**Network Element Type: Interface, SubType: E1****Table F-86** *Network Element Type: Interface, SubType: E1*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Controller	This attribute is required and is not modifiable.

**Feature: Basic****Note**

This feature is required.

**Table F-87** *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Framing	String	Choices: <ul style="list-style-type: none"> <li>CRC4 (default)</li> <li>NO-CRC4</li> </ul>	Framing	This attribute is required.
LineCode	String	Choices: <ul style="list-style-type: none"> <li>ami</li> <li>hdb3 (default)</li> </ul>	Line Code	This attribute is required.
Shutdown	Boolean		Shutdown	

## Feature: ClockSource

Table F-88 Feature ClockSource

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	<ul style="list-style-type: none"> <li>Condition: \$IOSVersion.GE("12.4(6)SW") &amp;&amp; \$DeviceType.startsWith("Cisco 7")</li> <li>Choices: <ul style="list-style-type: none"> <li>- internal</li> <li>- line</li> </ul> </li> <li>Condition: \$DeviceType.startsWith("Cisco 7")</li> <li>Choices: <ul style="list-style-type: none"> <li>- bits</li> <li>- internal</li> <li>- line</li> </ul> </li> <li>No condition:</li> <li>Choices: <ul style="list-style-type: none"> <li>- free-running</li> <li>- internal</li> <li>- line</li> </ul> </li> </ul>	Type	This attribute is required.
LinePriority	String	Condition: \$IOSVersion.GE("12.4(6)SW")  Choices: <ul style="list-style-type: none"> <li>- bits</li> <li>- primary (default)</li> <li>- secondary</li> </ul>	Line Priority	Condition: \$Input.ClockSource.Type == "line"    \$Input.ClockSource.Type == "bits"
SecondaryLinePriority	Integer	<ul style="list-style-type: none"> <li>Range: 1-72</li> <li>Default Value: 1</li> </ul>	Secondary Line Priority	Condition: \$Input.ClockSource.Type != "internal" && \$Input.ClockSource.LinePri ority && \$Input.ClockSource.LinePri ority == "secondary"

## Network Element Type: Interface, SubType: FastEthernet

**Table F-89** Network Element Type: "Interface" SubType: FastEthernet

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

**Table F-90** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Speed	String	Choices: <ul style="list-style-type: none"> <li>• auto (default)</li> <li>• 10</li> <li>• 100</li> </ul>	Speed	
Duplex	String	Choices: <ul style="list-style-type: none"> <li>• auto (default)</li> <li>• full</li> <li>• half</li> </ul>	Duplex	
MediaType	String	Choices: <ul style="list-style-type: none"> <li>• mii</li> <li>• rj45 (default)</li> </ul>	Media Type	Condition: \$DeviceType.startsWith("Cisco7") && ! \$DeviceType.startsWith("Cisco76")
IPAddress	IPAddress		IPAddress	
IPSubnetMask	IPAddress		IPSubnetMask	
Shutdown	Boolean		Shutdown	

## Network Element Type: Interface, SubType: GigabitEthernet

**Table F-91** Network Element Type: Interface, SubType: GigabitEthernet

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

## Feature: Basic

**Note**

This feature is required.

**Table F-92** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Speed	String	<ul style="list-style-type: none"> <li>Condition: \$DeviceType.startsWith("Cisco 76")</li> <li>Choices: <ul style="list-style-type: none"> <li>– nonegotiate</li> </ul> </li> <li>Condition: !\$DeviceType.startsWith("Cisco 76")</li> <li>Choices: <ul style="list-style-type: none"> <li>– auto (default)</li> <li>– 10</li> <li>– 100</li> <li>– 1000</li> </ul> </li> </ul>	Speed	
Duplex	String	Choices: <ul style="list-style-type: none"> <li>• auto (default)</li> <li>• full</li> <li>• half</li> </ul>	Duplex	Condition: !\$DeviceType.startsWith("Cisco76")
MediaType	String	Choices: <ul style="list-style-type: none"> <li>• gbic</li> <li>• rj45 (default)</li> </ul>	IPSubnetMask	Condition: \$DeviceType.startsWith("Cisco7")
IPAddress	IPAddress		IPAddress	
IPSubnetMask	IPAddress		IPSubnetMask	
Shutdown	Boolean		Shutdown	

## Network Element Type: Interface SubType: Serial



**Note** Condition: Serial Interface Only (*not including* serial interface Channelized from T1/E1 controllers)

**Table F-93** Network Element Type: Interface Subtype:Serial

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

**Table F-94** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name
Encapsulation	String	Choices: <ul style="list-style-type: none"> <li>mtp2</li> </ul>	Encapsulation
Shutdown	Boolean		Shutdown

## Network Element Type: Interface, SubType: Serial



**Note** Condition: Serial Interface Only (Channelized from T1/E1 controllers)

**Table F-95** Network Element Type: "Interface" SubType:"Serial"

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	Condition: !\$Context.operation.equalsIgnoreCase ("add")  This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-96**      **Feature: Basic**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Controller	String		Controller	This attribute is required and is not modifiable.
ChannelGroup	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Controller.starts With("T1") Range: 0-23</li> <li>Condition: \$Input.Basic.Controller.starts With("E1") Range: 0-30</li> </ul>	Channel Group	This attribute is required and is not modifiable.
BeginTimeSlot	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Controller.starts With("T1") Range: 1-24</li> <li>Condition: \$Input.Basic.Controller.starts With("E1") Range: 1-31</li> </ul>	Begin Time Slot	This attribute is required and is not modifiable.

Table F-96 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
EndTimeSlot	Integer	<ul style="list-style-type: none"> <li>• Condition: \$Input.Basic. Controller.starts With("T1") <ul style="list-style-type: none"> <li>- Range: 1-24</li> <li>- Default Value: \$!Input.Basic. BeginTimeSlot</li> </ul> </li> <li>• Condition: \$Input.Basic. Controller.starts With("E1") <ul style="list-style-type: none"> <li>- Range: 1-31</li> <li>- Default Value: \$!Input.Basic. BeginTimeSlot</li> </ul> </li> </ul>	End Time Slot	This attribute is required and is not modifiable.
Speed	Integer	Choices: <ul style="list-style-type: none"> <li>• 56</li> <li>• 64</li> </ul>	Speed (kbps)	This attribute is not modifiable.
Encapsulation	String	<ul style="list-style-type: none"> <li>• Condition: \$Input.Basic.Controller. startsWith("T1")            Choices:           <ul style="list-style-type: none"> <li>- mtp2</li> </ul> </li> <li>• Condition: \$Input.Basic.Controller. startsWith("E1")            Choices:           <ul style="list-style-type: none"> <li>- mtp2</li> <li>- hs-mtp2</li> </ul> </li> </ul>	Encapsulation	
Shutdown	Boolean		Shutdown	

## Network Element Type: Interface, SubType: T1

**Note**

Condition: T1 Interface Only; IOS Version 12.2(18)SW/12.2(18)IXA and above.

**Table F-97** Network Element Type: Interface, SubType: T1

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Controller	This attribute is required and is not modifiable.

### Feature: Basic

**Note**

This feature is required.

**Table F-98** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Framing	String	Choices: <ul style="list-style-type: none"> <li>• sf</li> <li>• esf</li> </ul>	Framing	This attribute is required.
LineCode	String	Choices: <ul style="list-style-type: none"> <li>• ami</li> <li>• b8zs</li> </ul>	Line Code	This attribute is required.
Shutdown	Boolean		Shutdown	

## Feature: ClockSource

Table F-99 Feature: "ClockSource"

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	<ul style="list-style-type: none"> <li>Condition: \$IOSVersion.GE("12.4(6)SW") &amp;&amp; \$DeviceType.startsWith("Cisco7") Choices:  <ul style="list-style-type: none"> <li>- internal</li> <li>- line</li> </ul> </li> <li>Condition: \$DeviceType.startsWith("Cisco7") Choices:  <ul style="list-style-type: none"> <li>- bits</li> <li>- internal</li> <li>- line</li> </ul> </li> <li>No condition: Choices:  <ul style="list-style-type: none"> <li>- free-running</li> <li>- internal</li> <li>- line</li> </ul> </li> </ul>	Type	This attribute is required.

Table F-99 Feature: "ClockSource" (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LinePriority	String	<ul style="list-style-type: none"> <li>Condition: \$IOSVersion.GE("12.4(6)SW")</li> <li>Choices: <ul style="list-style-type: none"> <li>bits</li> <li>primary</li> <li>secondary</li> </ul> </li> <li>No condition: <ul style="list-style-type: none"> <li>primary</li> <li>secondary</li> </ul> </li> </ul>	Line Priority	Condition: \$Input.ClockSource.Type == "bits"    \$Input.ClockSource.Type == "line"
SecondaryLinePriority	Integer	Range: 1-72	Secondary Line Priority	Condition: \$Input.ClockSource.Type != "internal" && \$Input.ClockSource.LinePriority && \$Input.ClockSource.LinePriority == "secondary"

## Feature: CableLength

Table F-100 Feature: "CableLength"

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	Choices: <ul style="list-style-type: none"> <li>long (default)</li> <li>short</li> </ul>	Cable Type	This attribute is required.
Gain	String	Choices: <ul style="list-style-type: none"> <li>gain26</li> <li>gain36</li> </ul>	Gain	Condition: \$Input.CableLength.Type && \$Input.CableLength.Type == "long" && !\$DeviceType.startsWith("Cisco73") && !\$DeviceType.startsWith("Cisco72") This attribute is required.

Table F-100 Feature: "CableLength" (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Pulse	String	Choices: <ul style="list-style-type: none"> <li>• 0 dB</li> <li>• -7.5 dB</li> <li>• -15 dB</li> <li>• -22.5 dB</li> </ul>	Pulse	Condition: \$Input.CableLength.Type && \$Input.CableLength.Type == "long" This attribute is required.
Length	String	<ul style="list-style-type: none"> <li>• Condition: !\$DeviceType.starts With("Cisco73")</li> </ul> Choices: <ul style="list-style-type: none"> <li>- 133</li> <li>- 266</li> <li>- 399</li> <li>- 533</li> <li>- 655</li> </ul> <ul style="list-style-type: none"> <li>• Condition: \$DeviceType.starts With("Cisco73")</li> </ul> Choices: <ul style="list-style-type: none"> <li>- 110</li> <li>- 220</li> <li>- 330</li> <li>- 440</li> <li>- 550</li> <li>- 600</li> </ul>	Length (feet)	\$Input.CableLength.Type && \$Input.CableLength.Type == "short" This attribute is required.

## Network Element Type: Link


**Note**

Condition: IOS Version 12.2(18)SW/12.2(18)IXA and above.

Table F-101 Network Element Type: "Link"

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Range: 0-15	SLC	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-102**      **Feature: Basic**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LinkType	String	Choices: <ul style="list-style-type: none"> <li>• MTP2</li> <li>• SCTP</li> <li>• HSL</li> <li>• HSMTP2</li> </ul>	Link Type	This attribute is required and is not modifiable.
Shutdown	Boolean		Shutdown	

### AttributeGroup: Interface


**Note**

- Condition: \$Input.Basic.LinkType != "SCTP"
- This attribute group is required

**Table F-103**      **AttributeGroup Interface**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
InterfaceName	String		InterfaceName	This attribute is required and is not modifiable.

### AttributeGroup: "SCTP"


**Note**

- Condition: \$Input.Basic.LinkType == "SCTP".
- This attribute group is required.

**Table F-104**      **AttributeGroup SCTP**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LocalPort	Integer	Range: 1,024-65,535	Local Port	This attribute is required and is not modifiable.
RemotePort	Integer	Range: 1,024-65,535	Remote Port	This attribute is required, is an array with a size limit of 4, and is not modifiable.

Table F-104 AttributeGroup SCTP (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RemoteIPAddress	IPAddress		Remote Addresses	This attribute is required and is not modifiable.
Draft2	Boolean		Draft2	This attribute is not modifiable.
Passive	Boolean		Passive	This attribute is not modifiable.

## Feature: SCTPParams



**Note** Condition: \$Input.Basic.LinkType == "SCTP".

Table F-105 Feature SCTPParams

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MaxAssocRetransmits	Integer	Range: 2-20	Maximum Association Retransmissions	
BundlingInterval	Integer	Range: 5-1,000	Bundling Interval Value (in ms)	
CumulativeSackValue	Integer	Range: 100-500	Cumulative Sack Value (in ms)	
IPPrecedenceType	Integer	Range: 0-7	IP Precedence Service Type	

Table F-105 Feature SCTPParams (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
IPDSCPValue	Combo	Choice: <ul style="list-style-type: none"> <li>• af11</li> <li>• af12</li> <li>• af13</li> <li>• af21</li> <li>• af22</li> <li>• af23</li> <li>• af31</li> <li>• af32</li> <li>• af33</li> <li>• af41</li> <li>• af42</li> <li>• af43</li> <li>• cs1</li> <li>• cs2</li> <li>• cs3</li> <li>• cs4</li> <li>• cs5</li> <li>• cs6</li> <li>• cs7</li> <li>• default</li> <li>• ef</li> </ul> Range: 0-63	IP DSCP Value	Condition: !\$Input.SCTPParamsIPPrecedenceType
DisableHoldTransport	Boolean		Disable Hold Transport	Condition: !\$Input.BasicSCTP.Draft2
FastRate	Integer	Range: 0-100 Default Value: 50	Fast CWND Decrease Rate	
IdleRate	Integer	Range: 0-100 Default Value: 50	Idle CWND	
InitSize	Integer	Range: 3,000-20,971,520 Default Value: 3,000	Initial CWND Size (in bytes)	
RetransRate	Integer	Range: 0-100 Default Value: 50	Retransmit CWND Rate	
SCTPRetransmit	Boolean	Default Value: False	SCTP Fast Retransmit	

Table F-105 Feature SCTPParams (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
KeepAliveInterval	Integer	Range: 300-30,000	Keepalive Internal Value (in ms)	
MaxInitRetrans	Integer	Range: 2-20	Maximum Initial Retransmit Retries	
MaxTimeout	Integer	Range: 1,000-60,000	Maximum Initial RTO Interval (in ms)	
MaxPathRetransmts	Integer	Range: 2-10	Maximum Path Retries	
RTOMinValue	Integer	Range: 100-60,000	Retransmission Minimum RTO Value (in ms)	
RTOMaxValue	Integer	Range: 100-60,000	Retransmission Maximum RTO Value (in ms)	
TxDepthValue	Integer	Condition: \$Input.Basic.LinkType == "SCTP"  Range: 10-40,000	Transmit Queue Depth Value	

## Feature: Description

Table F-106 Feature Description

Attribute Name	Type	Restriction(s)	GUI Display Name
DisplayName	String	Length: 0-30	Link Display Name
Description	String	<ul style="list-style-type: none"> <li>No condition: Length: 0-254</li> <li>Condition: (\$Node.DeviceType.startsWith("Cisco76") &amp;&amp; \$IOSVersion.GE("12.2(18)IXE"))    (\$IOSVersion.GE("12.4(11)SW3"))</li> <li>Length: 0-200</li> </ul>	Link Description

## Feature: LinkTimer

Table F-107 Feature LinkTimer

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LkRetryValue	Integer	Range: 60,000-90,000	retry Timer Value	
LkSLTT01Value	Integer	Range: 4,000-12,000	slt-t01 Timer Value	
LkSLTT02Value	Integer	Range: 30,000-90,000	slt-t02 Timer Value	
LkT01Value	Integer	Range: 500-1,200	t01 Timer Value	

Table F-107 Feature LinkTimer (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LkT02Value	Combo	Range: 700-2,000	t02 Timer Value	
LkT03Value	Boolean	Range: 500-1,200	t03 Timer Value	
LkT04Value	Integer	Range: 500-1,200	t04 Timer Value	
LkT05Value	Integer	Range: 500-1,200	t05 Timer Value	Condition: \$SP.Variant != "TTC"
LkT12Value	Integer	Range: 500-1,200	t12 Timer Value	Condition: \$SP.Variant != "TTC"
LkT13Value	Integer	Range: 500-800	t13 Timer Value	Condition: \$SP.Variant != "TTC"
LkT14Value	Boolean	Range: 2,000-3,000	t14 Timer Value	Condition: \$SP.Variant != "TTC"
LkT17Value	Integer	Range: 800-1,500	t17 Timer Value	Condition: \$SP.Variant != "TTC"
LkT19Value	Integer	Range: 48,000-60,000	t19Timer Value	Condition: \$SP.Variant == "ANSI"
LkT20Value	Integer	Range: 90,000-120,000	t20 Timer Value	Condition: \$SP.Variant == "ANSI"
LkT21Value	Integer	Range: 90,000-120,000	t21 Timer Value	Condition: \$SP.Variant == "ANSI"
LkT31Value	Integer	Range: 10,000-120,000	t31Timer Value	Condition: \$SP.Variant == "ANSI"
LkT32Value	Integer	Range: 50,000-120,000	t32 Timer Value	Condition: \$SP.Variant == "ANSI"

## Feature: MTP2Timer



Note

Condition: \$Input.Basic.LinkType == "MTP2".

Table F-108 Feature MTP2Timer

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MtT1Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI" Range: 12,500-16,000</li> <li>Condition: \$SP.Variant == "ITU" Range: 40,000-50,000</li> <li>Condition: \$SP.Variant == "TTC"    \$SP.Variant == "China" Range: 10,000-20,000</li> </ul>	t1 Timer Value	
MtT2Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI" Range: 5,000-14,000</li> <li>Condition: \$SP.Variant == "TTC"    \$SP.Variant == "China"    \$SP.Variant == "ITU" Range: 5,000-150,000</li> </ul>	t2 Timer Value	
MtT3Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI" Range: 5,000-14,000</li> <li>Condition: \$SP.Variant == "ITU" Range: 1,000-2,000</li> <li>Condition: \$SP.Variant == "TTC"    \$SP.Variant == "China" Range: 2,000-4,000</li> </ul>	t3 Timer Value	
MtT4eValue	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI" Range: 540-660</li> <li>Condition: \$SP.Variant == "ITU" Range: 400-600</li> <li>Condition: \$SP.Variant == "TTC"    \$SP.Variant == "China" Range: 2,000-4,000</li> </ul>	t4e Timer Value	
MtT4nValue	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI" Range: 2,007-2,530</li> <li>Condition: \$SP.Variant == "ITU"    \$SP.Variant == "China" Range: 7,500-9,500</li> </ul>	t4e Timer Value	Condition: \$SP.Variant != "TTC"

Table F-108 Feature MTP2Timer (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MtT5Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI"    \$SP.Variant == "ITU"    Range: 80-120</li> <li>Condition: \$SP.Variant == "TTC"    \$SP.Variant == "China" Range: 100-300</li> </ul>	t5 Timer Value	
MtT6Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI" Range: 1,000-6,000</li> <li>Condition: \$SP.Variant == "ITU" Range: 3,000-6,000</li> <li>Condition: \$SP.Variant == "TTC"    \$SP.Variant == "China" Range: 2,000-4,000</li> </ul>	t6 Timer Value	
MtT7Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI"    \$SP.Variant == "ITU"    Range: 500-2,000</li> <li>Condition: \$SP.Variant == "TTC"    \$SP.Variant == "China" Range: 1,500-3,000</li> </ul>	t7 timer Value	
MtTTCValue	Integer	Range: 20-1,000	ttc Timer Value	Condition: \$SP.Variant == "TTC"

## Feature: PeerTimer



**Note** Condition: \$Input.Basic.inkType == "SCTP".

Table F-109 Feature PeerTimer

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PtLSSUValue	Integer	Range: 500-30,000 Default Value: 4,000	lssu Timer Value	Condition: (!\$Input.Basic.SCTP.Draft2)
PtT01Value	Integer	Range: 500-60,000 Default Value: 45,000	t01 Timer Value	
PtT06Value	Integer	Range: 500-12,000 Default Value: 4,000	t06 Timer Value	
PtT2Value	Integer	Range: 500-150,000 Default Value: 60,000	t2 Timer Value	Condition: (!\$Input.Basic.SCTP.Draft2)

Table F-109 Feature PeerTimer (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PtT3Value	Integer	Range: 500-60,000 Default Value: 2,000	t3 Timer Value	Condition: (!\$Input.Basic.SCTP.Draft2)
PtT4eValue	Integer	Range: 100-5,000 Default Value: 500	t4e Timer Value	Condition: (!\$Input.Basic.SCTP.Draft2)
PtT4eEmerRate	Integer	Range: 100-2,000 Default Value: 100	t4e Emergency Rate (in ms)	Condition: (!\$Input.Basic.SCTP.Draft2)
PtT4nValue	Integer	Range: 500-60,000 Default Value: 8,000	t4n Timer Value	Condition: (!\$Input.Basic.SCTP.Draft2)
PtT4nNormRate	Integer	Range: 100-30,000	t4n Normal Value	Condition: (!\$Input.Basic.SCTP.Draft2)
PtT7Value	Integer	Range: 0-30,000 Default Value: 0	t7 Timer Value	Condition: (!\$Input.Basic.SCTP.Draft2)

## Feature: CTParams

Table F-110 Feature CTParams

Attribute Name	Type	Restriction(s)	GUI Display Name
CapacitySend	Integer	Range: 56,000-2,147,483,647	Plan Capacity Send Bandwidth (bps)
CapacityRcvd	Integer	Range: 56,000-2,147,483,647	Plan Capacity Receive Bandwidth (bps)
Thresholdsend	Integer	Range: 0-100	Threshold Send Percent
ThresholdRcvd	Integer	Range: 0-100	Threshold Receive Percent

## Feature: MTP2



**Note** Condition: \$Input.Basic.LinkType == "MTP2".

Table F-111 Feature MTP2

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PCR	Integer	Default Value: False	Preventive Cyclic Redundancy	
PCRN1	Integer	Range: 5-127	Maximum MSUs	Condition: \$Input.MTP2.PCR
PCRN2	Integer	Range: 200-34,621	Maximum Octets	Condition: \$Input.MTP2.PCR

Table F-111 Feature MTP2 (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
BundlingInterval	Integer	Range: 5-1,000	Bundling Interval Value (in ms)	Condition: \$DeviceType.startsWith("Cisco75")    \$DeviceType.startsWith("Cisco76")
TxDpethValue	Integer	Range: 25-5,000	Transmit Queue Depth Value	

**Feature: QoS**

**Note** Condition: \$Input.Basic.LinkType == "SCTP".

Table F-112 Feature QoS

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
QoSClass	Integer	Range: 1-7	QoS Class Value	This attribute is required.

**Feature: HSL**

**Note** Condition: \$Input.Basic.LinkType == "HSL".

Table F-113 Feature HSL

Attribute Name	Type	Restriction(s)	GUI Display Name
BundlingInterval	Integer	Range: 5-100	Bundling Interval Value (in ms)
HtForceProvingValue	Integer	Range: 0-20	force-proving Timer Value (in ms)
HtN1Value	Integer	Range: 5-180,000	n1 Timer Value
HtNoCreditValue	Integer	Range: 1-6	no-credit Timer Value (in sec)
HtNRPValue	Integer	Range: 1-10	nrp Value
HtRecoveryValue	Integer	Range: 30-1,440	SSCOP Recovery Value (in min)
HtT1Value	Integer	Range: 1-15	t1 Timer Value (in sec)
HtT2Value	Integer	Range: 15-180	t2 Timer Value (in sec)
HtT3Value	Integer	Range: 1-5,000	t3 Timer Value (in sec)
HtCCValue	Integer	Range: 100-2,000	cc-timer Value (in ms)
HtIdleValue	Integer	Range: 25-1,000	idle-timer Value (in ms)

Table F-113 Feature HSL (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name
HtKeepAliveValue	Integer	Range: 25-500	keepalive-timer Value (in ms)
HtPollValue	Integer	Range: 25-500	poll-timer Value (in ms)
HtNoResponseValue	Integer	Range: 200-2,000	noResponse-timer Value (in ms)
HtMaxCCValue	Integer	Range: 1-127	max-cc Retry Count
HTMaxPDValue	Integer	Range: 1-500	max-pd Frame Count
HtRcvWindowValue	Integer	Range: 1-1,024	Receive Window
HtSendWindowValue	Integer	Range: 1-1,024	Send Window

## Feature: HSMTP2



**Note**

Condition: \$Input.Basic.LinkType == "HSMTP2".

Table F-114 Feature HSMTP2

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
BundlingInterval	Integer	Range: 5-1,000	Bundling Interval Value (in ms)	Condition: \$DeviceType.startsWith("Cisco75")    \$DeviceType.startsWith("Cisco76")
TxDepthValue	Integer	Range: 250-50,000	Transmit Queue Depth Value	
HmT1Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI"    Range: 165,000-200,000</li> <li>Condition: \$SP.Variant == "ITU"    \$SP.Variant == "China" Range: 25,000-350,000</li> </ul>	t1 Timer Value	Condition: \$SP.Variant != "TTC"
HmT2Value	Integer	Range: 5,000-150,000	t2 Timer Value	Condition: \$SP.Variant != "TTC"
HmT3Value	Integer	Range: 1,000-2,000	t3 Timer Value	Condition: \$SP.Variant != "TTC"

Table F-114 Feature HSMTP2 (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
HmT4eValue	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI"    Range: 4,500-5,500</li> <li>Condition: \$SP.Variant == "ITU"    \$SP.Variant == "China" Range: 400-600</li> </ul>	t4e Timer Value	Condition; \$SP.Variant != "TTC"
HmT4nValue	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI"    Range: 27,000-33,000</li> <li>Condition: \$SP.Variant == "ITU"    \$SP.Variant == "China" Range: 3,000-70,000</li> </ul>	t4n Timer Value	Condition; \$SP.Variant != "TTC"
HmT5Value	Integer	Range: 80-120	t5 Timer Value	Condition; \$SP.Variant != "TTC"
HmT6Value	Integer	Range: 3,000-6,000	t6 Timer Value	Condition; \$SP.Variant != "TTC"
HmT7Value	Integer	Range: 500-2,000	t7 Timer Value	Condition; \$SP.Variant != "TTC"
HmT8Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI"    Range: 80-120</li> <li>Condition: \$SP.Variant == "ITU"    \$SP.Variant == "China" Range: 80-12,000</li> </ul>	t8 Timer Value	Condition; \$SP.Variant != "TTC"

## Network Element Type: Linkset

Table F-115 Feature QoS

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-19	Name	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-116**      *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
AdjacentPointCode	PointCode		Adjacent Point Code	This attribute is required and is not modifiable.
LcalPointCode	PointCode		Local Point Code	This attribute is not modifiable.
Shutdown	Boolean		Shutdown	

## Feature: Accounting

**Table F-117**      *Feature Accounting*

Attribute Name	Type	Restriction(s)	GUI Display Name
MTP3Accounting	Boolean		MTP3 Accounting
GTTAccounting	Boolean		GTT Accounting
UnrouteableAccounting	Boolean		Unrouteable Accounting

## Feature: Description

**Table F-118**      *Feature Description*

Attribute Name	Type	Restriction(s)	GUI Display Name
DisplayName	String	Length: 0-30	Linkset Display Name
Description	String	<ul style="list-style-type: none"> <li>Condition: (\$Node.DeviceType.startsWith("Cisco76") &amp;&amp; \$IOSVersion.GE("12.2(18)IXE"))    (\$IOSVersion.GE("12.4(11)SW3")) Length: 0-200</li> <li>No condition: Length: 0-254</li> </ul>	Linkset Description

**Feature: MTP3****Table F-119 Feature MTP3**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
DisplayAdjacentSP Restart	Boolean		Disable Adjacent SP Restart	Condition: \$SP.Variant == "ANSI"    \$SP.Variant == "China"    \$SP.Variant == "ITU"
DiableBroadcast	String	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "China"    \$SP.Variant == "ITU"    \$SP.Variant == "TTC"</li> </ul> Choices: <ul style="list-style-type: none"> <li>- all</li> <li>- tfa</li> <li>- tfp</li> </ul> <ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI"</li> </ul> Choices: <ul style="list-style-type: none"> <li>- all</li> <li>- txa-txr</li> <li>- txp</li> </ul>	Disable Broadcast Message Type	
DisablePreventiveTFPs	Boolean		Disable Preventive TFPs	

**Feature: Traffic****Table F-120 Feature Traffic**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
InboundACL	Integer	Range: 2,700-2,999	Inbound Access List	
OutboundACL	Integer	Range: 2,700-2,999	OutboundACL	
FalseCongestionLevel	Integer	Range: 1-3 Default Value: 1	False Congestion Level	Condition: \$SP.Variant == "ANSI"
SLSShiftBits	Integer	Range: 0-3	SLS Shift Bits	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ITU"   </li> <li>Condition: \$SP.Variant == "China"   </li> <li>Condition: \$SP.Variant == "TTC"</li> </ul>
DisableRotateSLS	Boolean		Disable Rotate SLS	Condition: \$SP.Variant == "ANSI"

## Feature: QoS

### AttributeGroup: MatchAccessGroup



**Note** Condition: !(\$Input.QoS.MatchSI) && !(\$Input.QoS.MatchAny).

**Table F-121** Feature MatchAccessGroup

Attribute Name	Type	Restriction(s)	GUI Display Name
EnableMatchAccessGroup	Boolean		Enable Match Access Group

### AttributeGroup: MatchSI



- Note**
- Condition: !(\$Input.QoS.MatchAccessGroup) && !(\$Input.QoS.MatchAny).
  - This attribute group is an array.

**Table F-122** Feature MatchSI

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SI	Integer	Range: 0-15 Default value: 0	SI	This attribute is required.
QoSClass	Integer		QoS Class	

### AttributeGroup: MatchAny



**Note** Condition: !(\$Input.QoS.MatchAccessGroup) && !(\$Input.QoS.MatchAny).

**Table F-123** Feature MatchAny

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
QoSClass	Integer	Range: 0-7	QoS Class	This attribute is required.

## Feature: Profile

**Table F-124** Feature Profile

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
ProfileName	String	Length: 0-19	Profile Name	This attribute is required.

## Feature: LinksetTimer

Table F-125 Feature LinksetTimer

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LsRetryTimerValue	Integer	Range: 60,000-90,000	Retry Timer Value	Condition: \$SP.Variant == "TTC"
LsSLTT01TimerValue	Integer	Range: 4,000-12,000	SLT t01 Timer Value	Condition: \$SP.Variant == "TTC"
LsSLTT02TimerValue	Integer	Range: 30,000-90,000	SLT t02 Timer Value	Condition: \$SP.Variant == "TTC"
LsT01TimerValue	Integer	Range: 500-1,200	t01 Timer Value	
LsT02TimerValue	Integer	Range: 700-2,00	t02 Timer Value	
LsT03TimerValue	Integer	Range: 500-1,200	t03 Timer Value	
LsT04TimerValue	Integer	Range: 500-1,200	t04 Timer Value	
LsT05TimerValue	Integer	Range: 500-1,200	t05 Timer Value	Condition: \$SP.Variant == "TTC"
LsT12TimerValue	Integer	Range: 800-1,500	t12 Timer Value	Condition: \$SP.Variant == "TTC"
LsT13TimerValue	Integer	Range: 800-1,500	t13 Timer Value	Condition: \$SP.Variant == "TTC"
LsT14TimerValue	Integer	Range: 2,000-3,000	t14 Timer Value	Condition: \$SP.Variant == "TTC"
LsT17TimerValue	Integer	Range: 800-1,500	t17 Timer Value	Condition: \$SP.Variant == "TTC"
LsT19TimerValue	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI" Range: 48,000-60,000</li> <li>Condition: \$SP.Variant == "China"    \$SP.Variant == "ITU" Range: 67,000-69,000</li> </ul>	t19 Timer Value	Condition: \$SP.Variant == "TTC"
LsT20TimerValue	Integer	Range: 90,000-120,000	t20 Timer Value	Condition: \$SP.Variant == "ANSI"
LsT21TimerValue	Integer	<ul style="list-style-type: none"> <li>Condition: \$SP.Variant == "ANSI" Range: 90,000-120,000</li> <li>Condition: \$SP.Variant == "China"    \$SP.Variant == "ITU" Range: 63,000-65,000</li> </ul>	t21 Timer Value	Condition: \$SP.Variant == "TTC"

Table F-125 Feature LinksetTimer (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LsT22TimerValue	Integer	Range: 180,000-360,000	t22 Timer Value	Condition: \$SP.Variant == "China"    \$SP.Variant == "ITU"
LsT23TimerValue	Integer	Range: 180,000-360,000	t23 Timer Value	Condition: \$SP.Variant == "China"    \$SP.Variant == "ITU"
LsT24TimerValue	Integer	Range: 500-500	t24 Timer Value	Condition: \$SP.Variant == "China"    \$SP.Variant == "ITU"
LsT25TimerValue	Integer	Range: 30,000-35,000	t25 Timer Value	Condition: \$SP.Variant == "ANSI"
LsT28TimerValue	Integer	Range: 3,000-35,000	t28 Timer Value	Condition: \$SP.Variant == "ANSI"
LsT29TimerValue	Integer	Range: 60,000-65,000	t29 Timer Value	Condition: \$SP.Variant == "ANSI"
LsT30TimerValue	Integer	Range: 30,000-35,000	t30 Timer Value	Condition: \$SP.Variant == "ANSI"
LsT31TimerValue	Integer	Range: 100,000-120,000	t31 Timer Value	Condition: \$SP.Variant == "ANSI"
LsT32TimerValue	Integer	Range: 5,000-120,000	t32 Timer Value	Condition: \$SP.Variant == "ANSI"

## Feature: TransTypeMap

### AttributeGroup: MappingRule



**Note** This attribute group is an array.

Table F-126 Feature MappingRule

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
ExistingType	Integer	Range: 0-255	Existing Type Value	This attribute is required.
MappedType	Integer	Range: 0-255	Mapped Type Value	This attribute is required.
Direction	String	Choices: <ul style="list-style-type: none"> <li>in</li> <li>out</li> </ul>	Direction	This attribute is required.

## Network Element Type: LocalPeer

Table F-127 Network Element Type: "LocalPeer"

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Range: 1024-49,151	Local Port	This attribute is required and is not modifiable.

### Feature: Basic



**Note**

This feature is required.

Table F-128 AttributeGroup: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LocalIP	IPAddress		LocalIP	This attribute is required, an array type (size limit is 4), and is not modifiable.
VIPSlot	Integer	Range: 0-16	VIP Slot Number	<ul style="list-style-type: none"> <li>Condition: \$DeviceType.startsWith("Cisco75")    \$DeviceType.startsWith("Cisco76")</li> <li>This attribute is not modifiable.</li> </ul>
Bay	Integer	Condition: \$DeviceCapabilities.contains("SUPERVISES_SAMI") <ul style="list-style-type: none"> <li>Range: 0-8</li> <li>Range: 0-1</li> </ul>	Bay	<ul style="list-style-type: none"> <li>Condition: \$DeviceType.startsWith("Cisco76")</li> <li>This attribute is required if (\$DeviceType.startsWith("Cisco76"))</li> <li>This attribute is not modifiable</li> </ul>

## Feature: SCTPParams

**Table F-129** Feature SCTPParams

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
IPPrecedenceType	Integer	Range: 0-7	IP Precedence Service Type	
IPDSCPValue	Combo	Range: 0-63 Choices: <ul style="list-style-type: none"> <li>• af11</li> <li>• af12</li> <li>• af13</li> <li>• af21</li> <li>• af22</li> <li>• af23</li> <li>• af31</li> <li>• af32</li> <li>• af33</li> <li>• af41</li> <li>• af42</li> <li>• af43</li> <li>• cs1</li> <li>• cs2</li> <li>• cs3</li> <li>• cs4</li> <li>• cs5</li> <li>• cs6</li> <li>• cs7</li> <li>• default</li> <li>• ef</li> </ul>	IP DSCP Value	Condition: !\$Input.SCTPParams.IPPrecedenceType

## Feature: M3UASUAParams

**Table F-130** Feature M3UASUAParams

Attribute Name	Type	Restriction(s)	GUI Display Name
RcvWindow	Integer	Range: 5,000-20,971,520	Receive Window Size

## Network Element Type: M3UA

Table F-131 Network Element Type: "M3UA"

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Range: 1024-65,535	Local Port Number	This attribute is required and is not modifiable.

### Feature: Basic



**Note**

This feature is required.

Table F-132 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
localIP	IPAddress		Local IP Addresses	This attribute is required, an array type (size limit is 4), and is not modifiable.
VIPSlot	Integer	Range: 0-16	VIP Slot Number	<ul style="list-style-type: none"> <li>Condition: \$DeviceType.startsWith ("Cisco75")    \$DeviceType.startsWith ("Cisco76")</li> <li>This attribute is not modifiable.</li> </ul>
Bay	Integer	Condition: \$DeviceCapabilities.contains ("SUPERVISES_SAMI") <ul style="list-style-type: none"> <li>Range: 0-8</li> <li>Range: 0-1</li> </ul>	Bay	<ul style="list-style-type: none"> <li>Condition: \$DeviceType.startsWith ("Cisco76")</li> <li>This attribute is not modifiable.</li> </ul>

### Feature: SCTPParams

Table F-133 Feature SCTPParams

Attribute Name	Type	Restriction(s)	GUI Display Name
MaxAssocRetransmits	Integer	Range: 2-20 Default Value: 10	Maximum Association Retransmissions
BundlingInterval	Integer	Range: 5-1,000 Default Value: 5	Bundling Interval Value (in ms)
CumulativeSackValue	Integer	Range: 100-500 Default Value: 200	Cumulative Sack Value (in ms)

**Table F-133** Feature *SCTPParams* (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name
FastRate	Integer	Range: 0-100 Default Value: 50	Fast CWND Decrease Rate
IdleRate	Integer	Range: 0-100 Default Value: 50	Idle CWND Decrease Rate
InitSize	Integer	Range: 3,000-20,971,520 Default Value: 3,000	Initial CWND Size (in bytes)
RetransRate	Integer	Range: 0-100 Default Value: 50	Retransmit CWND Rate
SCTPRetransmit	Boolean	Default Value: False	SCTP Fast Retransmit
KeepAliveInterval	Integer	Range: 300-30,000 Default Value: 30,000	Keepalive Interval Value (in ms)
MaxInitRetrans	Integer	Range: 2-20 Default Value: 8	Maximum Initial Retransmit Retries
MaxTimeout	Integer	Range: 1,000-60,000 Default Value: 1,000	Maximum Initial RTO Interval (in ms)
MaxPathRetransmits	Integer	Range: 2-10 Default Value: 4	Maximum Path Retries
RTOMinValue	Integer	Range: 100-60,000 Default Value: 1,000	Retransmission Minimum RTO Value (in ms)
RTOMaxValue	Integer	Range: 100-60,000 Default Value: 1,000	Retransmission Maximum RTO Value (in ms)
TxDepthValue	Integer	Range: 100-20,000 Default Value: 1,000	Transmit Queue

**Feature: M3UASUAParams****Table F-134** Feature *M3UASAParams*

Attribute Name	Type	Restriction(s)	GUI Display Name
MaxInStreams	Integer	Range: 2-25 Default Value: 17	Max Inbound Streams
RcvWindow	Integer	Range: 5000-20,971,520 Default Value: 64,000	Receive Window Size
Priority	String	Choices: <ul style="list-style-type: none"> <li>• equal (default)</li> <li>• high</li> </ul>	Unordered Priority

## Network Element Type: Profile

Table F-135 Network Element Type: "Profile"

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-19	Profile Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note**

This feature is required.

Table F-136 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Variant	String	Choices: <ul style="list-style-type: none"> <li>• ANSI</li> <li>• CHINA</li> <li>• ITU</li> <li>• TTC</li> </ul>	Variant	This attribute is not modifiable.

### Feature: MTP2

Table F-137 Feature MTP2

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PCR	Boolean	Default Value: False	Preventive Cyclic Redundancy	
PCRN1	Integer	Range: 5-127	Maximum MSUs	Condition: \$Input.MTP2.PCR
PCRN2	Integer	Range: 200-34,621	Maximum Octets	Condition: \$Input.MTP2.PCR
BundlingInterval	Integer	Range: 5-1,000	Bundling Interval Value (in ms)	Condition: \$DeviceType.startsWith("Cisco75")    \$DeviceType.startsWith("Cisco76")
TxDepthValue	Integer	Range: 25-5,000	Transmit Queue Depth Value	

## Feature: MTP2Timer

Table F-138 Feature MTP2Timer

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MtT1Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI" Range: 12,500-16,000</li> <li>Condition: \$Input.Basic.Variant == "ITU" Range: 40,000-50,000</li> <li>Condition: \$Input.Basic.Variant == "CHINA" Range: 10,000-20,000</li> </ul>	t1 Timer Value	
MtT2Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI" Range: 5,000-14,000</li> <li>Condition: \$Input.Basic.Variant == "TTC"    \$Input.Basic.Variant == "CHINA"    \$Input.Basic.Variant == "ITU" Range: 10,000-20,000</li> </ul>	t2 Timer Value	
MtT3Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI" Range: 5,000-14,000</li> <li>Condition: \$Input.Basic.Variant == "ITU" Range: 1,000-2,000</li> <li>Condition: \$Input.Basic.Variant == "TTC"    \$Input.Basic.Variant == "CHINA" Range: 2,000-4,000</li> </ul>	t3 Timer Value	

Table F-138 Feature MTP2Timer (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MtT4eValue	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI" Range: 540-660</li> <li>Condition: \$Input.Basic.Variant == "ITU" Range: 400-600</li> <li>Condition: \$Input.Basic.Variant == "TTC"    \$Input.Basic.Variant == "CHINA" Range: 2,000-4,000</li> </ul>	t4e Timer Value	
MtT4nValue	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI" Range: 2,007-2,530</li> <li>Condition: \$Input.Basic.Variant == "ITU"    \$Input.Basic.Variant == "CHINA" Range: 7,500-9,500</li> </ul>	t4n Timer Value	Condition: \$Input.Basic.Variant != "TTC"
MtT5Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI"    \$Input.Basic.Variant == "ITU" Range: 80-120</li> <li>Condition: \$Input.Basic.Variant == "TTC"    \$Input.Basic.Variant == "CHINA" Range: 100-300</li> </ul>	t5 Timer Value	
MtT6Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI" Range: 1,000-6,000</li> <li>Condition: \$Input.Basic.Variant == "ITU" Range: 3,000-6,000</li> <li>Condition: \$Input.Basic.Variant == "TTC"    \$Input.Basic.Variant == "CHINA" Range: 2,000-4,000</li> </ul>	t6 Timer Value	

Table F-138 Feature MTP2Timer (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MtT7Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI"    \$Input.Basic.Variant == "ITU" Range: 500-2,000</li> <li>Condition: \$Input.Basic.Variant == "TTC"    \$Input.Basic.Variant == "CHINA" Range: 1,500-3,000</li> </ul>	t7 Timer Value	
MtTTCValue	Integer	Range: 20-1,000	ttc Timer Value	Condition: \$Input.Basic.Variant == "TTC"

## Feature: SCTPParams

Table F-139 Feature SCTPParams

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MaxAssocRetransmits	Integer	Range: 2-20	Maximum Association Retransmissions	
BundlingInterval	Integer	Range: 5-1,000	Bundling Interval Value (in ms)	
CumulativeSackValue	Integer	Range: 100-500	Cumulative Sack Value (in ms)	
IPPrecedenceType	Integer	Range: 0-7	IP Precedence Type	

Table F-139 Feature SCTPParams (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
IPDSCPValue	Combo	Range: 0-63 Choices: <ul style="list-style-type: none"> <li>• af11</li> <li>• af12</li> <li>• af13</li> <li>• af21</li> <li>• af22</li> <li>• af23</li> <li>• af31</li> <li>• af32</li> <li>• af33</li> <li>• af41</li> <li>• af42</li> <li>• af43</li> <li>• cs1</li> <li>• cs2</li> <li>• cs3</li> <li>• cs4</li> <li>• cs5</li> <li>• cs6</li> <li>• cs7</li> <li>• default</li> <li>• ef</li> </ul>	IP DSCP Value	Condition: !\$Input.SCTP Params.IP PrecedenceType
DisableHoldTransport	Boolean		Disable Hold Transport	
FastRate	Integer	Range: 0-100 Default Value: 50	Fast CWND Decrease Rate	
IdleRate	Integer	Range: 0-100 Default Value: 50	Idle CWND Decrease Rate	
InitSize	Integer	Range: 3,000-20,971,520	Initial CWND Size (in bytes)	
RetransRate	Integer	Range: 0-100 Default Value: 50	Retransmit CWND Rate	
SCTPRetransmit	Boolean	Default Value: False	SCTP Fast Retransmit	
KeepAliveInterval	Integer	Range: 300-30,000	Keepalive Interval Value (in ms)	

Table F-139 Feature SCTPParams (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MaxInitRetrans	Integer	Range: 2-20	Maximum Initial Retransmit Retries	
MaxTimeout	Integer	Range: 1,000-60,000	Maximum Initial RTO Interval (in ms)	
MaxPathRetransmits	Integer	Range: 2-10	Maximum Path Retries	
RTOMinValue	Integer	Range: 100-60,000	Retransmission Minimum RTO Value (in ms)	
RTOMaxValue	Integer	Range: 100-60,000	Retransmission Maximum RTO Value (in ms)	
TxDepthValue	Integer	Range: 10-40,000	Transmit Queue Depth Value	

## Feature: PeerTimer

Table F-140 Feature PeerTimer

Attribute Name	Type	Restriction(s)	GUI Display Name
PtLSSUValue	Integer	Range: 500-30,000 Default Value: 4,000	Issu Timer Value
PtT01Value	Integer	Range: 500-60,000 Default Value: 4,500	t01 Timer Value
PtT06Value	Integer	Range: 500-30,000 Default Value: 4,000	t06 Timer Value
PtT2Value	Integer	Range: 500-12,000 Default Value: 4,000	t2 Timer Value
PtT3Value	Integer	Range: 500-150,000 Default Value: 60,000	t3 Timer Value
PtT4eValue	Integer	Range: 100-5,000 Default Value: 500	t4e Timer Value (in ms)
PtT4eEmerRate	Integer	Range: 100-2,000 Default Value: 100	t4e Emergency Rate (in ms)
PtT4nValue	Integer	Range: 500-60,000 Default Value: 8,000	t4n Timer Value (in ms)

Table F-140 Feature PeerTimer (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name
PtT4nNormRate	Integer	Range: 100-30,000	t4n Normal Rate (in ms)
PtT7Value	Integer	Range: 0-30,000 Default Value: 0	t7 Timer Value

## Feature: QoS

Table F-141 Feature QoS

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
QoSClass	Integer	Range: 1-7	QoS Class Value	This attribute is required.

## Feature: HSMTP2

Table F-142 Feature HSMTP2

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
BundlingInterval	Integer	Range: 5-1,000	Bundling Interval Value (in ms)	Condition: \$DeviceType.startsWith("Cisco75")    \$DeviceType.startsWith("Cisco76")
TxDepthValue	Integer	Range: 250-50,000	Transmit Queue Depth Value	
HmT1Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI" Range: 165,000-200,000</li> <li>Condition: \$Input.Basic.Variant == "ITU"    \$Input.Basic.Variant == "CHINA" Range: 25,000-350,000</li> </ul>	t1 Timer Value	Condition \$Input.Basic.Variant != "TTC"
HmT2Value	Integer	Range: 5,000-150,000	t2 Timer Value	Condition \$Input.Basic.Variant != "TTC"
HmT3Value	Integer	Range: 1,000-2,000	t3 Timer Value	Condition \$Input.Basic.Variant != "TTC"

Table F-142 Feature HSMTP2 (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
HmT4eValue	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI" Range: 4,500-5,500</li> <li>Condition: \$Input.Basic.Variant == "ITU"    \$Input.Basic.Variant == "CHINA" Range: 400-600</li> </ul>	t4e Timer Value	Condition \$Input.Basic.Variant != "TTC"
HmT4nValue	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI" Range: 27,000-33,000</li> <li>Condition: \$Input.Basic.Variant == "ITU"    \$Input.Basic.Variant == "CHINA" Range: 3,000-70,000</li> </ul>	t4n Timer Value	Condition \$Input.Basic.Variant != "TTC"
HmT5Value	Integer	Range: 80-120	t5 Timer Value	Condition \$Input.Basic.Variant != "TTC"
HmT6Value	Integer	Range: 3,000-6,000	t6 Timer Value	Condition \$Input.Basic.Variant != "TTC"
HmT7Value	Integer	Range: 500-2,000	t7 Timer Value	Condition \$Input.Basic.Variant != "TTC"
HmT8Value	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Variant == "ANSI" Range: 80-120</li> <li>Condition: \$Input.Basic.Variant == "ITU"    \$Input.Basic.Variant == "CHINA" Range: 80-12,000</li> </ul>	t8 Timer Value	Condition \$Input.Basic.Variant != "TTC"

**Feature: HSL****Note**

Condition: \$DeviceType.startsWith("Cisco7")

**Table F-143 Feature HSL**

Attribute Name	Type	Restriction(s)	GUI Display Name
BundlingInterval	Integer	Range: 5-100	Bundling Interval Value (in ms)
HtForceProvingValue	Integer	Range: 0-20	force-proving Timer Value
HtN1Value	Integer	Range: 5-180,000	n1 Timer Value
HtNoCreditValue	Integer	Range: 1-6	no-credit Timer Value (in sec)
HtNRPValue	Integer	Range: 1-100	nrp Value
HtRecoveryValue	Integer	Range: 30-1,440	SSCOP Recovery Value (in min)
HtT1Value	Integer	Range: 1-15	t1 Timer Value (in sec)
HtT2Value	Integer	Range: 15-180	t2 Timer Value (in sec)
HtT3Value	Integer	Range: 1-5,000	t3 Timer Value (in ms)
HtCCValue	Integer	Range: 100-2,000	cc timer Value (in ms)
HtIdleValue	Integer	Range: 25-1,000	idle timer Value (in ms)
HtKeepAliveValue	Integer	Range: 25-500	keepalive-timer Value (in ms)
HtPollValue	Integer	Range: 200-2,000	poll-timer Value (in ms)
HTNoResponseValue	Integer	Range: 1-127	noresponsetimer Value (in ms)
HtMaxCCValue	Integer	Range: 1-500	max-cc Retry Count
HtMaxPDValue	Integer	Range: 1-500	max-pd Frame Count
HtRcvWindowValue	Integer	Range: 1-1,024	Receive Window
HtSendWindowValue	Integer	Range: 1-1,024	Send Window

## Network Element Type: SAMI



**Note** Condition: ITP 7600 and Chassis Contains SAMI Card

**Table F-144** Network Element Type: SAMI

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Range: 0-16	Module Number	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

### AttributeGroup: IPAddress



**Note** This attribute group is an array type.

**Table F-145** AttributeGroup: IPAddress

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
IPAddress	IPAddress		IPAddress	This attribute is required and is not modifiable.
IPSubnetMask	IPAddress		IPSubnetMask	This attribute is required and is not modifiable.
Vlan	Integer	Range: 1-4094	Vlan	This attribute is required and is not modifiable.

### AttributeGroup: IPRoute



**Note** This attribute group is an array type.

**Table F-146** AttributeGroup: IPRoute

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
IPNetwork	IPAddress		IPNetwork	This attribute is required and is not modifiable.
IPSubnetMask	IPAddress		IPSubnetMask	This attribute is required and is not modifiable.
ForwardAddress	IPAddress		ForwardAddress	This attribute is required and is not modifiable.

## Network Element Type: SUA

Table F-147 Network Element Type: SUA

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1024-65,535	Local Port Number	This attribute is required and is not modifiable.

### Feature: Basic



**Note**

This feature is required.

Table F-148 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LocalIP	IPAddress		Local IP Addresses	This attribute is required, an array type (size limit is 4), and is not modifiable.
VIPSlot	Integer	Range: 0-16	VIP Slot Number	<ul style="list-style-type: none"> <li>Condition: \$DeviceType.startsWith("Cisco 75")    \$DeviceType.startsWith("Cisco 76")</li> <li>This attribute is required if (\$DeviceType.startsWith("Cisco 76"))</li> <li>This attribute is not modifiable.</li> </ul>
Bay	Integer	Condition: \$DeviceCapabilities.contains("SUPERVISES_SAMI") <ul style="list-style-type: none"> <li>Range: 0-8</li> <li>Range: 0-1</li> </ul>	Bay/CPU	<ul style="list-style-type: none"> <li>Condition: \$DeviceType.startsWith("Cisco 76")</li> <li>This attribute is required if (\$DeviceType.startsWith("Cisco 76"))</li> <li>This attribute is not modifiable.</li> </ul>

## Feature: SCTPParams

**Table F-149** Feature SCTPParams

Attribute Name	Type	Restriction(s)	GUI Display Name
MaxAssocRetransmits	Integer	Range: 2-20 Default Value: 10	Maximum Association Retransmissions
BundlingInterval	Integer	Range: 5-1,000 Default Value: 5	Bundling Interval Value (in ms)
CumulativeSackValue	Integer	Range: 100-500 Default Value: 200	Cumulative Sack Value (in ms)
FastRate	Integer	Range: 0-100 Default Value: 50	Fast CWND Decrease Rate
IdleRate	Integer	Range: 0-100 Default Value: 50	Idle CWND Decrease Rate
InitSize	Integer	Range: 3,000-20,971,520 Default Value: 3,000	Initial CWND Size (in bytes)
RetransRate	Integer	Range: 0-100 Default Value: 50	Retransmit CWND Rate
SCTPRetransmit	Boolean	Default Value: False	SCTP Fast Retransmit
KeepAliveInterval	Integer	Range: 300-30,000 Default Value: 30,000	KeepAlive Interval Value (in ms)
MaxInitRetrans	Integer	Range: 2-20 Default Value: 8	Maximum Initial Retransmit Retries
MaxTimeout	Integer	Range: 1,000-60,000 Default Value: 1,000	Maximum Initial RTO Interval (in ms)
MaxPathRetransmits	Integer	Range: 2-10 Default Value: 4	Maximum Path Retries
RTOMinValue	Integer	Range: 100-60,000 Default Value: 1,000	Retransmission Minimum RTO Value (in ms)
RTOMaxValue	Integer	Range: 100-60,000 Default Value: 1,000	Retransmission Maximum RTO Value (in ms)
TxDepthValue	Integer	Range: 100-20,000 Default Value: 1,000	Transmit Queue Depth Value

**Feature: M3UASUAParams****Table F-150** Feature M3UASUAParams

Attribute Name	Type	Restriction(s)	GUI Display Name
MaxInStreams	Integer	Range: 2-25 Default Value: 17	Max Inbound Streams
RecvWindow	Integer	Range: 5000-20,971,520 Default Value: 64,000	Receive Window Size
Priority	String	Choices: <ul style="list-style-type: none"> <li>• equal (default)</li> <li>• high</li> </ul>	Unordered Priority

# RAN Provisioning Attributes

The following sections describe the RAN attributes:

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- [Network Element Type: CEMClass, page F-80](#)
- [Network Element Type: CEMGroup, page F-81](#)
- [Network Element Type: Interface SubType: ATM, page F-85](#)
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## Network Element Type: ATMConnect

Table F-151 Network Element Type: ATMConnect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-15	Connection Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note**

This feature is required.

Table F-152 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SrcInt	String		Source ATM Interface	This attribute is required and is not modifiable.
SrcPVCPVP	String		Source PVC / PVP	This attribute is required and is not modifiable.
DestInt	String		Destination ATM Interface	This attribute is required and is not modifiable.
DestPVCPVP	String		Destination PVC / PVP	This attribute is required and is not modifiable.

## Network Element Type: CEMClass

Table F-153 Network Element Type: CEMClass

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-15	CEM class Name	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-154** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SampleRate	Integer	Range: 1-2	Sample rate	Condition: (! \$Node.DeviceType.startsWith("Cisco76")) && (! \$Node.DeviceType.startsWith("CiscoMWR-2941"))
DejitterBuffer	Integer	Range: 4-500	Dejitter Buffer (in ms)	
PayloadSize	Integer	Range: 32-1312	Payload Size	Condition: \$Node.DeviceType.startsWith("Cisco76")
IdlePattern	String		Idle Pattern (in Hex)	
DummyMode	String	Choices: <ul style="list-style-type: none"> <li>last-frame</li> <li>user-defined</li> </ul>	Dummy Mode	Condition: \$Node.DeviceType.startsWith("Cisco76")
DummyPattern	String		Dummy Pattern (in Hex)	Condition: \$Node.DeviceType.startsWith("Cisco76")

## Network Element Type: CEMGroup

**Table F-155** Network Element Type: CEMGroup

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Condition: \$Input.Basic.Controller. startsWith("T1") <ul style="list-style-type: none"> <li>Range: 0-23</li> </ul> No condition: <ul style="list-style-type: none"> <li>Range: 0-30</li> </ul>	CEM Group Number	This attribute is required and is not modifiable.

## Feature: Basic

**Note**

This feature is required.

Table F-156 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Controller	String		Controller	This attribute is required and is not modifiable.
Unframed	Boolean		Unframed	This attribute is not modifiable.
BeginTimeSlot	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Controller.starts With("T1") Range: 1-24</li> <li>Condition: \$Input.Basic.Controller.starts With("E1") Range: 1-31</li> </ul>	Begin Time Slot	<ul style="list-style-type: none"> <li>Condition: !\$Input.Basic.Unframed</li> <li>This attribute is required and is not modifiable.</li> </ul>
EndTimeSlot	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Controller.starts With("T1") <ul style="list-style-type: none"> <li>Range: 1-24</li> <li>Default Value: \$!Input.Basic.BeginTimeSlot</li> </ul> </li> <li>Condition: \$Input.Basic.Controller.starts With("E1") <ul style="list-style-type: none"> <li>Range: 1-31</li> <li>Default Value: \$!Input.Basic.BeginTimeSlot</li> </ul> </li> </ul>	End Time Slot	<ul style="list-style-type: none"> <li>Condition: !\$Input.Basic.Unframed</li> <li>This attribute is not modifiable</li> </ul>
CEMClass	String		CEM Class	

Table F-156 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SampleRate	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.BeginTimeSlot &amp;&amp; \$Input.Basic.EndTimeSlot &amp;&amp; ( \$Input.Basic.BeginTimeSlot == \$!Input.Basic.EndTimeSlot ) &amp;&amp; ( \$IOSVersion.GE("12.4(16)MR ")) Range: 4-8</li> <li>Condition: \$Input.Basic.BeginTimeSlot &amp;&amp; \$Input.Basic.EndTimeSlot &amp;&amp; ( \$Input.Basic.BeginTimeSlot == \$!Input.Basic.EndTimeSlot ) &amp;&amp; ( \$IOSVersion.LT("12.4(16)MR" )) Range: 2-2</li> <li>No condition: Range: 1-2</li> </ul>	Sample Rate	Condition: (!\$Node.DeviceType.startsWith("Cisco76")) && (! \$Node.DeviceType.startsWith("C iscoMWR-2941"))
DejitterBuffer	Integer	Range: 4-500	Dejitter Buffer (in ms)	
PayloadSize	Integer	Range: 32-1312	Payload Size	Condition: \$Node.DeviceType.startsWith("C isco76")
IdlePattern	String		Idle Pattern (in Hex 0-FF)	
DummyMode	String	Choices: <ul style="list-style-type: none"> <li>last-frame</li> <li>user-defined</li> </ul>	Dummy Mode	Condition: \$Node.DeviceType.startsWith("C isco76")
DummyPattern	String		Dummy Pattern (in Hex 0-FF)	Condition: \$Node.DeviceType.startsWith("C isco76")

## Feature: XConnect

Table F-157 Feature: XConnect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PeerIP	IPAddress		Peer IP Address	This attribute is required.
VCIDValue	Integer	Range: 1-4,294,967,295	VC ID	This attribute is required.
Encapsulation	String	<ul style="list-style-type: none"> <li>Condition: (            \$Node.DeviceType.starts            With("Cisco76") &amp;&amp;            \$IOSVersion.LT("12.2(33)SRC") )               \$Node.DeviceType.starts            With("Cisco3825")                       Choices:                       - mpls         </li> <li>No condition:                       Choices:                       - mpls                       - l2tpv3         </li> </ul>	Encapsulation Type	
PWClass	String		Pseudowire Class	
SequencingType	String	Choices: <ul style="list-style-type: none"> <li>both</li> <li>transmit</li> <li>receive</li> </ul>	Sequencing Type	Condition: ( \$Node.DeviceType.startsWith("CiscoMWR")    \$Node.DeviceType.startsWith("Cisco3825")    (((\$Node.DeviceType.startsWith("Cisco76") && \$IOSVersion.GE("12.2(33)SRC")))) && ( ! \$Input.XConnect.PWClass)
BackupPeerIP	IPAddress		Backup Peer IP Address	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
BackupVCIDValue	Integer	Range: 1-4,294,967,295	Backup VC ID	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
BackupPWClass	String		Backup Pseudowire Class	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )

Table F-157 Feature: XConnect (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
EnableDelay	Integer	Range: 0-180	Backup Enable Delay	
NeverDisable	Boolean		Never Disable	
DisableDelay	Integer	Range: 0-180	Backup Disable Delay	Condition: ( ! \$Input.XConnect.NeverDisable )

## Network Element Type: Interface SubType: ATM

Table F-158 Network Element Type: Interface SubType: ATM

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

Table F-159 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Controller	String		Controller	<ul style="list-style-type: none"> <li>Condition: (! \$Parent)    ( \$Parent.RDN.startsWith("T1")    \$Parent.RDN.startsWith("E1") )</li> <li>This attribute is required and is not modifiable.</li> </ul>
AIMSlotNum	Integer	Range: 0-1	AIM Slot Number	<ul style="list-style-type: none"> <li>Condition: (! \$Node.DeviceType.startsWith("Cisco76")) &amp;&amp; (! \$Node.DeviceType.startsWith("CiscoMWR-2941"))</li> <li>This attribute is required and is not modifiable.</li> </ul>
IMAGroup	Integer	Range: 0-3	IMA Group Number	Condition: (\$Node.DeviceType.startsWith("CiscoMWR-1941")    \$Node.DeviceType.startsWith("Cisco3825"))
Shutdown	Boolean		Shutdown	

## Feature: IntParams

Table F-160 Feature: IntParams

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Keepalive	Integer	Range: 1-65,535	ATM Ilmi Keepalive (in secs)	
LoadInterval	Integer	Range: 30-600	Load Interval (in secs)	
Dynamic	Boolean		ATM Bandwidth Dynamic	
Payload	Boolean		Scrambling Payload	Condition: !\$Node.DeviceType.startsW ith("Cisco76")
McptTimer1	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.sta rtsWith("CiscoMWR- 2941") Range: 500-10000</li> <li>Condition: (\$Node.DeviceType.st artsWith("CiscoMWR -1941")    \$Node.DeviceType.sta rtsWith("Cisco3825")) Range: 1000-10000</li> <li>Condition: \$Node.DeviceType.sta rtsWith("Cisco76") Range: 20-50000</li> </ul>	ATM MCPT Timer 1 (in micro secs)	Condition: \$Node.DeviceType.startsWi th("CiscoMWR")    \$Node.DeviceType.startsWi th("Cisco3825")    ( \$Node.DeviceType.startsWi th("Cisco76") && ! \$Input.Basic.Controller )
McptTimer2	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.sta rtsWith("CiscoMWR- 2941") Range: 500-10000</li> <li>Condition: \$Node.DeviceType.sta rtsWith("CiscoMWR- 1941")    \$Node.DeviceType.sta rtsWith("Cisco3825") Range: 1000-10000</li> <li>Condition: \$Node.DeviceType.sta rtsWith("Cisco76") Range: 20-50000</li> </ul>	Integer ATM MCPT Timer 2 (in micro secs)	Condition: \$Node.DeviceType.startsWi th("CiscoMWR")    \$Node.DeviceType.startsWi th("Cisco3825")    ( \$Node.DeviceType.startsWi th("Cisco76") && ! \$Input.Basic.Controller )

Table F-160 Feature: IntParams (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
McptTimer3	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR-2941") Range: 500-10000</li> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR-1941")    \$Node.DeviceType.startsWith("Cisco3825") Range: 1000-10000</li> <li>Condition: \$Node.DeviceType.startsWith("Cisco76") Range: 20-50000</li> </ul>	Integer ATM MCPT Timer 3 (in micro secs)	Condition: \$Node.DeviceType.startsWith("CiscoMWR")    \$Node.DeviceType.startsWith("Cisco3825")    (\$Node.DeviceType.startsWith("Cisco76") && ! \$Input.Basic.Controller )

## Feature: Description

Table F-161 Feature: Description

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description

## Feature: XConnect



**Note** Condition: ( ! \$Input.Basic.IMAGroup ) && ( ! \$Node.DeviceType.startsWith("Cisco76") )

Table F-162 Feature: XConnect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PeerIP	IPAddress		Peer IP Address	This attribute is required.
VCIDValue	Integer	Range: 1-4,294,967,295	VC ID	This attribute is required.
Encapsulation	String	Choices: <ul style="list-style-type: none"> <li>mpls</li> <li>l2tpv3</li> </ul>	Encapsulation Type	
PWClass	String		Pseudowire Class	

Table F-162 Feature: XConnect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SequencingType	String	Choices: <ul style="list-style-type: none"> <li>both</li> <li>transmit</li> <li>receive</li> </ul>	Sequencing Type	Condition: ( \$Node.DeviceType.startsWith(“CiscoMWR-1941”)    \$Node.DeviceType.startsWith(“Cisco3825”) ) && ( ! \$Input.XConnect.PWClass)
BackupPeerIP	IPAddress		Backup Peer IP Address	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == “mpls” )
BackupVCIDValue	Integer	Range: 1-4,294,967,295	Backup VC ID	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == “mpls” )
BackupPWClass	String		Backup Pseudowire Class	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == “mpls” )
EnableDelay	Integer	Range: 0-180	Backup Enable Delay	
NeverDisable	Boolean		Never Disable	
DisableDelay	Integer	Range: 0-180	Backup Disable Delay	Condition: ( ! \$Input.XConnect.NeverDisable

## Network Element Type: Interface SubType: ATMSubInf

Table F-163 Network Element Type: Interface SubType: ATMSubInf

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

## Feature: Basic



**Note**

This feature is required.

**Table F-164** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SubInfNum	Integer	Range: 0-4294967295	ATM Sub-Interface Number	This attribute is required and is not modifiable.
SubInfType	String	Choices: <ul style="list-style-type: none"> <li>• multipoint</li> <li>• point-to-point</li> </ul>	ATM Sub-Interface Type	This attribute is not modifiable.
Shutdown	Boolean		Shutdown	

## Feature: Description

**Table F-165** Feature: Description

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description

## Feature: XConnect



**Note**

Condition: (! \$Node.DeviceType.startsWith("Cisco76"))

**Table F-166** Feature: XConnect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PeerIP	IPAddress		Peer IP Address	This attribute is required.
VCIDValue	Integer	Range: 1-4,294,967,295	VC ID	This attribute is required.
Encapsulation	String	Choices: <ul style="list-style-type: none"> <li>• mpls</li> <li>• l2tpv3</li> </ul>	Encapsulation Type	
PWClass	String		Pseudowire Class	
SequencingType	String	Choices: <ul style="list-style-type: none"> <li>• both</li> <li>• transmit</li> <li>• receive</li> </ul>	Sequencing Type	Condition: ( \$Node.DeviceType.startsWith("CiscoMWR") ) && ( ! \$Input.XConnect.PWClass)

Table F-166 Feature: XConnect (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
BackupPeerIP	IPAddress		Backup Peer IP Address	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
BackupVCIDValue	Integer	Range: 1-4,294,967,295	Backup VC ID	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
BackupPWClass	String		Backup Pseudowire Class	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
EnableDelay	Integer	Range: 0-180	Backup Enable Delay	
NeverDisable	Boolean		Never Disable	
DisableDelay	Integer	Range: 0-180	Backup Disable Delay	Condition: ( ! \$Input.XConnect.NeverDisable

## Network Element Type: Interface SubType: BITS

Table F-167 Network Element Type: Interface SubType: BITS

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Controller	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

Table F-168 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Applique	String	Choices: <ul style="list-style-type: none"> <li>• T1</li> <li>• E1</li> </ul>	Applique	This attribute is required.

Table F-168 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LineCode	String	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.Basic.Applique == "E1"</code> Choices: <ul style="list-style-type: none"> <li>ami</li> <li>hdb3 (default)</li> </ul> </li> <li>Condition: <code>\$Input.Basic.Applique == "T1"</code> Choices: <ul style="list-style-type: none"> <li>ami</li> <li>b8zs (default)</li> </ul> </li> </ul>	Line Code	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.Basic.Applique</code></li> <li>This attribute is required.</li> </ul>
Framing	String	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.Basic.Applique == "E1"</code> Choices: <ul style="list-style-type: none"> <li>crc4</li> <li>no-crc4</li> <li>none (default)</li> </ul> </li> <li>Condition: <code>\$Input.Basic.Applique == "T1"</code> Choices: <ul style="list-style-type: none"> <li>sf</li> <li>esf</li> <li>none (default)</li> </ul> </li> </ul>	Framing	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.Basic.Applique</code></li> <li>This attribute is required.</li> </ul>
Signaling	String	Choices: <ul style="list-style-type: none"> <li>cas (default)</li> <li>ccs</li> </ul>	Signaling	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.Basic.Applique &amp;&amp; \$Input.Basic.Applique == "E1" &amp;&amp; \$Input.Basic.Framing &amp;&amp; \$Input.Basic.Framing != "none"</code></li> <li>This attribute is required.</li> </ul>
Shutdown	Boolean		Shutdown	

## Feature: Description

Table F-169 Feature: Description

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-80	Controller Description

## Network Element Type: Interface SubType: CEM

**Table F-170** Network Element Type: Interface SubType: CEM

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note**

This feature is required.

**Table F-171** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name
Shutdown	Boolean		Shutdown

### Feature: Description

**Table F-172** Feature: Description

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description

## Network Element Type: Interface SubType: E1

**Table F-173** Network Element Type: Interface SubType: E1

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Controller	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-174**      *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
LineCode	String	Choices: <ul style="list-style-type: none"> <li>• ami</li> <li>• hdb3 (default)</li> </ul>	Line Code	This attribute is required.
Framing	String	Choices: <ul style="list-style-type: none"> <li>• CRC4 (default)</li> <li>• NO-CRC4</li> </ul>	Framing	This attribute is required.
Australia	Boolean		Australian Layer 1	
IMAGroup	Integer		IMA Group Number	Condition: ( \$Node.DeviceType.startsWith("Ci sco76")    \$Node.DeviceType.startsWith("Ci scoMWR-2941"))
IMAPayload	Boolean		IMA Scrambling Payload	Condition: ( \$Node.DeviceType.startsWith("Ci scoMWR-2941") && \$Input.Basic.IMAGroup )
Shutdown	Boolean		Shutdown	

## Feature: Description

**Table F-175**      *Feature: Description*

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Controller Description

## Feature: ClockSource

Table F-176 Feature: ClockSource

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	<ul style="list-style-type: none"> <li>Condition: <code>\$Node.DeviceType.startsWith("Cisco76")</code></li> <li>Choices: <ul style="list-style-type: none"> <li>– enhanced</li> <li>– internal</li> <li>– line</li> <li>– recovered</li> </ul> </li> <li>Condition: <code>\$Node.DeviceType.startsWith("CiscoMWR-2941")</code></li> <li>Choices: <ul style="list-style-type: none"> <li>– internal</li> <li>– line</li> </ul> </li> <li>No condition:</li> <li>Choices: <ul style="list-style-type: none"> <li>– free-running</li> <li>– internal</li> <li>– line</li> </ul> </li> </ul>	Type	This attribute is required.
LinePriority	String	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.ClockSource.Type &amp;&amp; \$Input.ClockSource.Type == "line"</code></li> <li>Choices: <ul style="list-style-type: none"> <li>– bits</li> <li>– independent</li> <li>– primary</li> </ul> </li> <li>Condition: <code>\$Input.ClockSource.Type &amp;&amp; \$Input.ClockSource.Type == "internal"</code></li> <li>Choices: <ul style="list-style-type: none"> <li>– independent</li> </ul> </li> </ul>	Line Priority	Condition: <code>( ! \$Node.DeviceType.startsWith("Cisco76") ) &amp;&amp; ( \$Input.ClockSource.Type &amp;&amp; \$Input.ClockSource.Type != "free-running" )</code>
RecoveredClockID	Integer	Range: 0-23	Recovered Clock ID	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.ClockSource.Type &amp;&amp; \$Input.ClockSource.Type == "recovered"</code></li> <li>This attribute is required.</li> </ul>

## Network Element Type: Interface SubType: FastEthernet

**Table F-177** Network Element Type: Interface SubType: FastEthernet

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

**Table F-178** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Speed	String	Choices: <ul style="list-style-type: none"> <li>• auto (default)</li> <li>• 10</li> <li>• 100</li> </ul>	Speed	
Duplex	String	Choices: <ul style="list-style-type: none"> <li>• auto (default)</li> <li>• full</li> <li>• half</li> </ul>	Duplex	
MediaType	String	Choices: <ul style="list-style-type: none"> <li>• mii</li> <li>• rj45 (default)</li> </ul>	Media Type	Condition: \$DeviceType.startsWith("Cisco7")
MPLS	Boolean		MPLS IP	
IPAddress	IPAddress		IPAddress	
IPSubnetMask	IPAddress		IPSubnetMask	
Shutdown	Boolean		Shutdown	

### Feature: Description

**Table F-179** Feature: Description

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description

## Network Element Type: Interface SubType: GigabitEthernet

Table F-180 Network Element Type: Interface SubType: GigabitEthernet

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note**

This feature is required.

Table F-181 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Speed	String	Choices: <ul style="list-style-type: none"> <li>• auto (default)</li> <li>• 10</li> <li>• 100</li> <li>• 1000</li> </ul>	Speed	
Duplex	String	Choices: <ul style="list-style-type: none"> <li>• full</li> <li>• half</li> </ul>	Duplex	
MediaType	String	Choices: <ul style="list-style-type: none"> <li>• rj45 (default)</li> <li>• sfp</li> </ul>	MediaType	Condition: \$Node.DeviceType.startsWith("Cisco3825")
MPLS	Boolean		MPLS IP	
IPAddress	IPAddress		IPAddress	
IPSubnetMask	IPAddress		IPSubnetMask	
Shutdown	Boolean		Shutdown	

### Feature: Description

Table F-182 Feature: Description

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description

## Network Element Type: Interface SubType: IMA

**Table F-183** Network Element Type: Interface SubType: IMA

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

**Table F-184** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
IMASlotPort	Integer	Range: 0-0	IMA Slot / Port Number	<ul style="list-style-type: none"> <li>Condition: (\$Node.DeviceType.startsWith("CiscoMWR-1941")    \$Node.DeviceType.startsWith("Cisco3825"))</li> <li>This attribute is required and is not modifiable.</li> </ul>
IMAGroup	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("Cisco76") Range: 0-41</li> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR-2941") Range: 0-23</li> <li>No condition: Range: 0-3</li> </ul>	IMA Group Number	This attribute is required and is not modifiable.
Controller	String		Controller	<ul style="list-style-type: none"> <li>Condition: (\$Node.DeviceType.startsWith("Cisco76")    \$Node.DeviceType.startsWith("CiscoMWR-2941"))</li> <li>This attribute is required.</li> <li>This attribute is an array type.</li> </ul>

Table F-184 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MinLinks	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR-2941") Range: 1-24</li> <li>Condition: \$Node.DeviceType.startsWith("Cisco76") Range: 1-16</li> <li>No condition: Range: 1-12</li> </ul>	Minimum Active Links	
IMADelay	Integer	<ul style="list-style-type: none"> <li>Condition: (\$Node.DeviceType.startsWith("Cisco76")    \$Node.DeviceType.startsWith("CiscoMWR-2941")) Range: 25-250</li> <li>No condition: Range: 25-200</li> </ul>	Maximum Differential Delay Tolerance (in ms)	
IMAVersion	String	Choices: <ul style="list-style-type: none"> <li>1.0</li> <li>1.1</li> </ul>	IMA Version	Condition: (\$Node.DeviceType.startsWith("Cisco76")    \$Node.DeviceType.startsWith("CiscoMWR-2941"))

## Feature: IntParams

Table F-185 Feature: IntParams

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Keepalive	Integer	Range: 1-65,535	ATM Ilmi Keepalive (in secs)	
LoadInterval	Integer	Range: 30-600	Load Interval (in secs)	
Dynamic	Boolean		ATM Bandwidth Dynamic	
McptTimer1	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR-2941") Range: 500-10000</li> <li>No condition: Range: 1000-10000</li> </ul>	ATM MCPT Timer 1 (in micro secs)	Condition: !\$Node.DeviceType.startsWith("Cisco76")

Table F-185 Feature: IntParams (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
McptTimer2	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR-2941") Range: 500-10000</li> <li>No condition: Range: 1000-10000</li> </ul>	ATM MCPT Timer 2 (in micro secs)	Condition: !\$Node.DeviceType.startsWith("Cisco76")
McptTimer3	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR-2941") Range: 500-10000</li> <li>No condition: Range: 1000-10000</li> </ul>	ATM MCPT Timer 3 (in micro secs)	Condition: !\$Node.DeviceType.startsWith("Cisco76")

## Feature: Description

Table F-186 Feature: Description

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description

## Feature: XConnect



### Note

Condition: ((! \$Node.DeviceType.startsWith("Cisco76")) && (! \$Node.DeviceType.startsWith("CiscoMWR-2941")))

Table F-187 Feature: XConnect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PeerIP	IPAddress		Peer IP Address	This attribute is required.
VCIDValue	Integer	Range: 1-4,294,967,295	VC ID	This attribute is required.
Encapsulation	String	Choices: <ul style="list-style-type: none"> <li>mpls</li> <li>l2tpv3</li> </ul>	Encapsulation Type	
PWClass	String		Pseudowire Class	

Table F-187 Feature: XConnect (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SequencingType	String	Choices: <ul style="list-style-type: none"> <li>both</li> <li>transmit</li> <li>receive</li> </ul>	Sequencing Type	Condition: ( \$Node.DeviceType.startsWith("Cisco MWR")    \$Node.DeviceType.startsWith("Cisco 3825")) && ( ! \$Input.XConnect.PWClass)
BackupPeerIP	IPAddress		Backup Peer IP Address	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
BackupVCIDValue	Integer	Range: 1-4,294,967,295	Backup VC ID	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
BackupPWClass	String		Backup Pseudowire Class	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
EnableDelay	Integer	Range: 0-180	Backup Enable Delay	
NeverDisable	Boolean		Never Disable	
DisableDelay	Integer	Range: 0-180	Backup Disable Delay	Condition: ( ! \$Input.XConnect.NeverDisable

## Network Element Type: Interface SubType: Loopback

Table F-188 Network Element Type: Interface SubType: Loopback

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

Table F-189 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name
IPAddress	IPAddress		IPAddress

Table F-189 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name
IPSubnetMask	IPAddress		IPSubnetMask
Shutdown	Boolean		Shutdown

## Feature: Description

Table F-190 Feature: Description

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description

## Network Element Type: Interface SubType: Serial

Table F-191 Network Element Type: Interface SubType: Serial

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

## Feature: Basic



**Note** This feature is required.

Table F-192 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Controller	String		Controller	This attribute is required and is not modifiable.
ChannelGroup	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Controller.startsWith("T1") Range: 0-23</li> <li>Condition: \$Input.Basic.Controller.startsWith("E1") Range: 0-30</li> </ul>	Channel Group	This attribute is required and is not modifiable.

Table F-192 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
BeginTimeSlot	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Controller.startsWith("T1") Range: 1-24</li> <li>Condition: \$Input.Basic.Controller.startsWith("E1") Range: 1-31</li> </ul>	Begin Time Slot	This attribute is required and is not modifiable.
EndTimeSlot	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Controller.startsWith("T1") <ul style="list-style-type: none"> <li>– Range: 1-24</li> <li>– Default Value: \$!Input.Basic.BeginTimeSlot</li> </ul> </li> <li>Condition: \$Input.Basic.Controller.startsWith("E1") <ul style="list-style-type: none"> <li>– Range: 1-31</li> <li>– Default Value: \$!Input.Basic.BeginTimeSlot</li> </ul> </li> </ul>	End Time Slot	This attribute is not modifiable.
Speed	Integer	Choices: <ul style="list-style-type: none"> <li>• 56</li> <li>• 64</li> </ul>	Speed (Kb/s)	This attribute is not modifiable.
Shutdown	Boolean		Shutdown	

## Network Element Type: Interface SubType: SONET

Table F-193 Network Element Type: Interface SubType: SONET

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

## Feature: Basic



**Note**

This feature is required.

**Table F-194** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Framing	String	Choices: <ul style="list-style-type: none"> <li>• sdh</li> <li>• sonet</li> </ul>	Framing	This attribute is required.
Shutdown	Boolean		Shutdown	

## Feature: Description

**Table F-195** Feature: Description

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Description

## Feature: ClockSource

**Table F-196** Feature: ClockSource

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	Choices: <ul style="list-style-type: none"> <li>• internal</li> <li>• line</li> </ul>	Type	This attribute is required.

## Network Element Type: Interface SubType: Tunnel

**Table F-197** Network Element Type: Interface SubType: Tunnel

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Interface Name	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-198**      *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name
IPAddress	IPAddress		IPAddress
IPSubnetMask	IPAddress		IPSubnetMask
MPLS	Boolean		MPLS IP
Shutdown	Boolean		Shutdown

## Feature: Description

**Table F-199**      *Feature: Description*

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description

## Feature: IntParams

**Table F-200**      *Feature: IntParams*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Keepalive	Integer	Range: 0-32767	Keepalive (in secs)	
KeepaliveRetry	Integer	Range: 1-255	Keepalive Retries	
LoadInterval	Integer	Range: 30-600	Load Interval (in secs)	
SrcInterface	String		Source Interface	
SrcIPAddress	IPAddress		Source IP Address	Condition: (! \$Input.IntParams.SrcInterface)
DestIPAddress	IPAddress		Destination IP Address	

## Network Element Type: Interface SubType: T1

**Table F-201**      *Network Element Type: Interface SubType: T1*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Controller	This attribute is required and is not modifiable.

## Feature: Basic



**Note**

This feature is required.

**Table F-202**      *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Framing	String	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.starts With("Cisco76")</li> <li>Choices:               <ul style="list-style-type: none"> <li>- sf</li> <li>- esf</li> <li>- unframed</li> </ul> </li> <li>No condition:               <ul style="list-style-type: none"> <li>Choices:                   <ul style="list-style-type: none"> <li>- sf</li> <li>- esf</li> </ul> </li> </ul> </li> </ul>	Framing	This attribute is required.
LineCode	String	Choices: <ul style="list-style-type: none"> <li>• ami</li> <li>• b8zs</li> </ul>	Line Code	This attribute is required.
IMAGroup	Integer		IMA Group Number	Condition: (\$Node.DeviceType.startsW ith("Cisco76")    \$Node.DeviceType.startsWi th("CiscoMWR-2941"))
IMAPayload	Integer		IMA Scrambling Payload	Condition: ( \$Node.DeviceType.startsWi th("CiscoMWR-2941") && \$Input.Basic.IMAGroup )
Shutdown	Boolean		Shutdown	

## Feature: Description

**Table F-203**      *Feature: Description*

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description

## Feature: ClockSource

Table F-204 Feature: ClockSource

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("Cisco76") Choices: <ul style="list-style-type: none"> <li>enhanced</li> <li>internal</li> <li>line</li> <li>recovered</li> </ul> </li> <li>Condition: \$Node.DeviceType.startsWith("CiscoMW R-2941") Choices: <ul style="list-style-type: none"> <li>internal</li> <li>line</li> </ul> </li> <li>No condition: Choices: <ul style="list-style-type: none"> <li>free-running</li> <li>internal</li> <li>line</li> </ul> </li> </ul>	Type	This attribute is required.
LinePriority	String	<ul style="list-style-type: none"> <li>Condition: \$Input.ClockSource.Type &amp;&amp; \$Input.ClockSource.Type == "line" Choices: <ul style="list-style-type: none"> <li>bits</li> <li>independent</li> <li>primary</li> </ul> </li> <li>Condition: \$Input.ClockSource.Type &amp;&amp; \$Input.ClockSource.Type == "internal" Choices: <ul style="list-style-type: none"> <li>independent</li> </ul> </li> </ul>	Line Priority	Condition: !\$Node.DeviceType.startsWith("Cisco76") && (\$Input.ClockSource.Type && \$Input.ClockSource.Type != "free-running")
RecoveredClockID	Integer	Range: 0-23	Recovered Clock ID	<ul style="list-style-type: none"> <li>Condition: \$Input.ClockSource.Type &amp;&amp; \$Input.ClockSource.Type == "recovered"</li> <li>This attribute is required.</li> </ul>

## Feature: CableLength

Table F-205 Feature: "CableLength"

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	<ul style="list-style-type: none"> <li>Condition: <code>\$Node.DeviceType.startsWith("Cisco76")</code> Choices:               <ul style="list-style-type: none"> <li>short (default)</li> </ul> </li> <li>No condition: Choices:               <ul style="list-style-type: none"> <li>long (default)</li> <li>short</li> </ul> </li> </ul>	Cable Type	This attribute is required.
Gain	String	Choices: <ul style="list-style-type: none"> <li>gain26</li> <li>gain36</li> </ul>	Gain	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.CableLength.Type &amp;&amp; \$Input.CableLength.Type == "long" &amp;&amp; (\$IOSVersion.LT("12.4(19)MR"))</code></li> <li>This attribute is required.</li> </ul>
Pulse	String	Choices: <ul style="list-style-type: none"> <li>0 dB</li> <li>-7.5 dB</li> <li>-15 dB</li> <li>-22.5 dB</li> </ul>	Pulse	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.CableLength.Type &amp;&amp; \$Input.CableLength.Type == "long"</code></li> <li>This attribute is required.</li> </ul>

Table F-205 Feature: "CableLength" (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Length	String	<ul style="list-style-type: none"> <li>Condition: (\$IOSVersion.GE("12.4 (19)MR"))</li> <li>Choices: <ul style="list-style-type: none"> <li>- 110</li> <li>- 220</li> <li>- 330</li> <li>- 440</li> <li>- 550</li> <li>- 600</li> </ul> </li> <li>Condition: (\$IOSVersion.LT("12.4 (19)MR"))</li> <li>Choices: <ul style="list-style-type: none"> <li>- 133</li> <li>- 266</li> <li>- 399</li> <li>- 533</li> <li>- 655</li> </ul> </li> </ul>	Length (feet)	<ul style="list-style-type: none"> <li>Condition: \$Input.CableLength.Type &amp;&amp; \$Input.CableLength.Type == "short"</li> <li>This attribute is required.</li> </ul>

## Network Element Type: Interface SubType: VirtualCEM

Table F-206 Network Element Type: Interface SubType: VirtualCEM

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Controller	This attribute is required and is not modifiable.

### Feature: Basic


**Note**

This feature is required.

Table F-207 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name
Shutdown	Boolean		Shutdown

## Feature: Description

**Table F-208**      *Feature: Description*

Attribute Name	Type	Restriction(s)	GUI Display Name
Description	String	Length: 0-242	Interface Description

## Network Element Type: Node

**Table F-209**      *Network Element Type: Node*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Node Name	This attribute is required and is not modifiable.

## Feature: Basic



**Note**

This feature is required.

**Table F-210**      *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Hostname	String		Host Name	This attribute is required and is not modifiable.

**Feature: CardType****AttributeGroup: CardTypeGroup**

**Note** This attribute group is an array type.

**Table F-211 AttributeGroup CardTypeGroup**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
ControllerType	String	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("Cisco76") Choices:               <ul style="list-style-type: none"> <li>- e1</li> <li>- t1</li> <li>- e3</li> <li>- t3</li> </ul> </li> <li>No condition: Choices:               <ul style="list-style-type: none"> <li>- e1</li> <li>- t1</li> </ul> </li> </ul>	Controller Type	This attribute is required and is not modifiable.
CardSlotNum	String	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR-2941") Range: 0-0</li> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR-1941") Range: 0-1</li> <li>Condition: \$Node.DeviceType.startsWith("Cisco3825") Range: 0-2</li> <li>Condition: \$Node.DeviceType.startsWith("Cisco76") Range: 0-13</li> </ul>	Card Slot Number	This attribute is required and is not modifiable.

Table F-211 AttributeGroup CardTypeGroup (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
WICSlotNum	String	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR") Range: 0-2</li> <li>No condition: Range: 0-3</li> </ul>	WIC / SPA Slot Number	This attribute is required and is not modifiable.

## Feature: NetworkClockSelect

Table F-212 Feature: NetworkClockSelect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
HoldTime	Integer	Range: 0-86400	Hold Timeout	Condition: \$Node.DeviceType.startsWith("CiscoMWR-2941")
RevertMode	String	Choices: <ul style="list-style-type: none"> <li>revert</li> <li>nonrevert</li> </ul>	Mode	Condition: \$Node.DeviceType.startsWith("CiscoMWR-2941")

### AttributeGroup: NetworkClockSelectGroup


**Note**

- Condition: ! \$Node.DeviceType.startsWith("Cisco76")
- This attribute group is an array type.

Table F-213 AttributeGroup NetworkClockSelectGroup

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
ClockPriority	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("CiscoMWR-2941") Range: 1-22</li> <li>No condition: Range: 1-8</li> </ul>	Clock Priority	This attribute is required and is not modifiable.
IntName	String		Interface Name	This attribute is required and is not modifiable.

**AttributeGroup: NetworkClockSelectGroup76**

**Note** Condition: \$Node.DeviceType.startsWith("Cisco76")

- This attribute group is an array type.

**Table F-214** AttributeGroup NetworkClockSelectGroup76

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
ClockPriority	Integer	Range: 1-6	Clock Priority	This attribute is required and is not modifiable.
Type	String	Choices: <ul style="list-style-type: none"> <li>• interface</li> <li>• controller</li> </ul>	Type	This attribute is required and is not modifiable.
IntName	String		Interface Name	This attribute is required and is not modifiable.

**Feature: NetworkClockParticipate**

**Note** Condition: ! \$Node.DeviceType.startsWith("CiscoMWR-2941")

**AttributeGroup: NetworkClockParticipateGroup**

- Note**
- Condition: ! \$Node.DeviceType.startsWith("Cisco76")
  - This attribute group is an array type.

**Table F-215** AttributeGroup NetworkClockParticipateGroup

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
ModuleType	String	Choices: <ul style="list-style-type: none"> <li>• aim</li> <li>• slot</li> <li>• wic</li> </ul>	Module Type	This attribute is required and is not modifiable.
SlotNum	Integer	Range: 0-3	Slot Number	This attribute is required and is not modifiable.

**AttributeGroup: NetworkClockParticipateGroup76****Note**

- Condition: \$Node.DeviceType.startsWith(“Cisco76”)
- This attribute group is an array type.

**Table F-216** *AttributeGroup NetworkClockParticipateGroup76*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
DisableSlotNum	Integer	Range: 1-6	Disable Slot Number	This attribute is required and is not modifiable.

**Network Element Type: PVC****Table F-217** *Network Element Type: PVC*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		VPI / VCI	This attribute is required and is not modifiable.

## Feature: Basic

This feature is required.

**Table F-218** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
VPI	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.starts With("Cisco76")  Range: 0-255</li> <li>Condition: (\$Node.DeviceType.starts With("CiscoMWR")    \$Node.DeviceType.starts With("Cisco3825"))  Range: 0-31</li> </ul>	VPI	This attribute is not modifiable.
VCI	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.starts With("Cisco76")  Range: 1-65,535</li> <li>Condition: (\$Node.DeviceType.starts With("CiscoMWR")    \$Node.DeviceType.starts With("Cisco3825"))  Range: 1-255</li> </ul>	VCI	This attribute is required and is not modifiable.
PVCType	String	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.starts With("Cisco76")  Choices: <ul style="list-style-type: none"> <li>- ilmi</li> <li>- l2transport</li> <li>- qsaal</li> </ul> </li> <li>No condition:  Choices: <ul style="list-style-type: none"> <li>- ces</li> <li>- ilmi</li> <li>- l2transport</li> <li>- qsaal</li> </ul> </li> </ul>	PVC Type	This attribute is not modifiable.

Table F-218 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PVCName	String	Length: 0-15	PVC Name	This attribute is not modifiable.
Encapsulation	String	<ul style="list-style-type: none"> <li>Condition: ( \$Node.DeviceType.starts With("Cisco76") &amp;&amp; ( \$Parent.NESubType == "ATM" &amp;&amp; \$Parent.Parent.NETType == "Node" ) )</li> </ul> Choices: <ul style="list-style-type: none"> <li>- aal0</li> <li>- aal5</li> <li>- aal5mux</li> <li>- aal5snap</li> </ul> <ul style="list-style-type: none"> <li>No condition:</li> </ul> Choices: <ul style="list-style-type: none"> <li>- aal0</li> <li>- aal5</li> </ul>	Encapsulation Type	Condition: ( \$Input.Basic.PVCType ) && ( \$Input.Basic.PVCType == "l2transport" )

## Feature: PVCRewrite



## Note

Condition: ( \$Node.DeviceType.starts With("CiscoMWR") || \$Node.DeviceType.starts With("Cisco3825") ) && ( !\$Input.XConnect || ( \$Input.XConnect && !\$Input.XConnect.OneToOne && !\$Input.XConnect.IgnoreVPIVCI ) ) && ( \$Input.Basic.Encapsulation ) && ( \$Input.Basic.Encapsulation == "aal0" )

Table F-219 Feature: PVCRewrite

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PWPVC	String		Rewrite VPI / VCI	
PWVPI	Integer	Range: 0-255	VPI	This attribute is required.
PWVCI	Integer	Range: 0-65,535	VCI	This attribute is required.

## Feature: CellPack

Table F-220 Feature: CellPack

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
CellCount	Integer	<ul style="list-style-type: none"> <li>Condition: \$Node.DeviceType.startsWith("Cisco 76") Range: 2-255</li> <li>Condition: \$Node.DeviceType.startsWith("Cisco MWR")    \$Node.DeviceType.startsWith("Cisco 3825") Range: 2-28</li> </ul>	Cell Packet Count	This attribute is required
McptTimer	Integer	Range: 1-3	MCPT Timer	This attribute is required

## Feature: XConnect



**Note**

Condition: ( ! \$Input.UMTSIUB ) && ( \$Input.Basic.PVCType ) && ( \$Input.Basic.PVCType == "12transport" )

Table F-221 Feature: XConnect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PeerIP	IPAddress		Peer IP Address	This attribute is required.
VCIDValue	Integer	Range: 1-4,294,967,295	VC ID	This attribute is required.
Encapsulation	String	<ul style="list-style-type: none"> <li>Condition: ( \$Node.DeviceType.startsWith("Cisco76") &amp;&amp; \$IOSVersion.LT("12.2(33)SRC") ) Choices: - mpls</li> <li>No condition: Choices: - mpls - 12tpv3</li> </ul>	Encapsulation Type	
PWClass	String		Pseudowire Class	

Table F-221 Feature: XConnect (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SequencingType	String	Choices: <ul style="list-style-type: none"> <li>• both</li> <li>• transmit</li> <li>• receive</li> </ul>	Sequencing Type	Condition: ( \$Node.DeviceType.startsWi th(“CiscoMWR”)    \$Node.DeviceType.startsWi th(“Cisco3825”) ) && ( ! \$Input.XConnect.PWClass)
OneToOne	Boolean		One To One	Condition: ( \$Node.DeviceType.startsWi th(“CiscoMWR”)    \$Node.DeviceType.startsWi th(“Cisco3825”) ) && ( \$Input.Basic.Encapsulation ) && ( \$Input.Basic.Encapsulation == “aal0” )
IgnoreVPIVCI	Boolean		Ignore VPI VCI	Condition: ( \$Node.DeviceType.startsWi th(“CiscoMWR”)    \$Node.DeviceType.startsWi th(“Cisco3825”) ) && ( \$IOSVersion.GE(“12.4(16) MR2”) ) && ( ! \$Input.XConnect.OneToOn e ) && ( \$Input.Basic.Encapsulation ) && ( \$Input.Basic.Encapsulation == “aal0” )
BackupPeerIP	IPAddress		Backup Peer IP Address	Condition: ( \$Input.XConnect.Encapsula tion ) && ( \$Input.XConnect.Encapsula tion == “mpls” )
BackupVCIDValue	Integer	Range: 1-4,294,967,295	Backup VC ID	Condition: ( \$Input.XConnect.Encapsula tion ) && ( \$Input.XConnect.Encapsula tion == “mpls” )
BackupPWClass	String		Backup Pseudowire Class	Condition: ( \$Input.XConnect.Encapsula tion ) && ( \$Input.XConnect.Encapsula tion == “mpls” )
EnableDelay	Integer	Range: 0-180	Backup Enable Delay	

Table F-221 Feature: XConnect (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
NeverDisable	Boolean		Never Disable	
DisableDelay	Integer	Range: 0-180	Backup Disable Delay	Condition: ( !\$Input.XConnect.NeverDisable

## Network Element Type: PVP

Table F-222 Network Element Type: PVP

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Range: 0-255	VPI Number	This attribute is required and is not modifiable.

### Feature: Basic


**Note**

This feature is required.

Table F-223 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
L2TransportPVP	Boolean		L2Transport PVP	This attribute is required and is not modifiable.
PeakRate	Integer	<ul style="list-style-type: none"> <li>Condition: ( \$Parent.NESubType == "IMA" ) Range: 8-30464</li> <li>Condition: ( \$Parent.NESubType == "ATM" &amp;&amp; \$Parent.Parent.NEType == "Node" ) Range: 84-149760</li> <li>Condition: ( \$Parent.NESubType == "ATM" &amp;&amp; \$Parent.Parent.NESubType &amp;&amp; ( \$Parent.Parent.NESubType == "T1"    \$Parent.Parent.NESubType == "E1" ) ) Range: 8-1920</li> </ul>	Peak Rate	Condition: ( !\$Input.Basic.L2TransportPVP )  This attribute is required.

## Feature: CellPack


**Note**

Condition: ( \$Input.Basic.L2TransportPVP ) && ( ( \$Parent.IntParams && \$Parent.IntParams.McptTimer1 ) || ( \$Parent.Parent.IntParams && \$Parent.Parent.IntParams.McptTimer1 ) )

**Table F-224**      **Feature: CellPack**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
CellCount	Integer	Range: 2-255	Cell Packet Count	This attribute is required.
McptTimer	Integer	Range: 1-3	MCPT Timer	This attribute is required.

## Feature: XConnect


**Note**

Condition: ( \$Input.Basic.L2TransportPVP )

**Table F-225**      **Feature: XConnect**

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PeerIP	IPAddress		Peer IP Address	This attribute is required.
VCIDValue	Integer	Range: 1-4,294,967,295	VC ID	This attribute is required.
Encapsulation	String	<ul style="list-style-type: none"> <li>Condition: ( \$Node.DeviceType.startsWith("Cisco76") &amp;&amp; \$IOSVersion.GE("12.2(33)SRC") )</li> <li>Choices: <ul style="list-style-type: none"> <li>- mpls</li> <li>- l2tpv3</li> </ul> </li> <li>No condition: <ul style="list-style-type: none"> <li>- mpls</li> </ul> </li> </ul>	Encapsulation Type	
PWClass	String		Pseudowire Class	
BackupPeerIP	IPAddress		Backup Peer IP Address	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )

Table F-225 Feature: XConnect (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
BackupVCIDValue	Integer	Range: 1-4,294,967,295	Backup VC ID	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
BackupPWClass	String		Backup Pseudowire Class	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
EnableDelay	Integer	Range: 0-180	Backup Enable Delay	
NeverDisable	Boolean		Never Disable	
DisableDelay	Integer	Range: 0-180	Backup Disable Delay	Condition: ( ! \$Input.XConnect.NeverDisable

## Network Element Type: PWClass

Table F-226 Network Element Type: PWClass

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-32	Pseudowire Class Name	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-227**      *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Encapsulation	String	Condition: ( \$Node.DeviceType.starts With("Cisco76") && \$IOSVersion.LT("12.2(33 )SRC"))  Choices: - mpls  • No condition: Choices: - mpls - l2tpv3	Encapsulation Type	This attribute is required and is not modifiable.
Interworking	String	Choices: • ip • ethernet	Interworking	Condition: ( \$Input.Basic.Encapsulation )
SequencingType	String	Choices: • both • transmit • receive	Sequencing Type	Condition: (! \$Input.Basic.Interworking ) && ( \$Node.DeviceType.startsWith("Cisco MWR")    \$Node.DeviceType.startsWith("Cisco3 825"))
ResyncCount	Integer	• Range: 5-65535 • Default Value: 100	Resync Packet Count	Condition: (! \$Input.Basic.SequencingType ) && ( \$Node.DeviceType.startsWith("Cisco MWR")    \$Node.DeviceType.startsWith("Cisco3 825"))
ExpValue	Integer	Range: 0-7	MPLS Experimental Value	Condition: (! \$Node.DeviceType.startsWith("Cisco7 6")) && ( \$Input.Basic.Encapsulation ) && ( \$Input.Basic.Encapsulation == "mpls" )
PreferredPath	String	Choices: • peer • interface	Preferred Path	Condition: ( \$Input.Basic.Encapsulation ) && ( \$Input.Basic.Encapsulation == "mpls" )

Table F-227 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PreferredTunnel	String		Preferred Tunnel	Condition: ( \$Input.Basic.PreferredPath ) && ( \$Input.Basic.PreferredPath == "interface" ) This attribute is required.
PreferredPeer	IPAddress		Preferred Peer IP	Condition: ( \$Input.Basic.PreferredPath ) && ( \$Input.Basic.PreferredPath == "peer" ) This attribute is required.
DisableFallback	Boolean		Disable Fallback	Condition: ( \$Input.Basic.PreferredPath )
Protocol	String	Choices: <ul style="list-style-type: none"> <li>• 12tpv2</li> <li>• 12tpv3</li> <li>• none</li> </ul> Default Value: \$!Input.Basic.Encapsulation	Protocol	Condition: ( \$Input.Basic.Encapsulation ) && ( \$Input.Basic.Encapsulation == "12tpv3" )
IPLocalInterface	String		IP Local Interface	Condition: ( \$Input.Basic.Encapsulation ) && ( \$Input.Basic.Encapsulation == "12tpv3" ) This attribute is required.

## Network Element Type: RTM

Table F-228 Network Element Type: RTM

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Module RTM	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-229**      *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
DisableRTM	Boolean		Disable RTM	Condition: (! \$Input.Basic.TopEnable)
ModeType	String	Choices: <ul style="list-style-type: none"> <li>• master</li> <li>• slave</li> <li>• repeater</li> </ul>	Mode Type	Condition: (! \$Input.Basic.DisableRTM ) This attribute is required.
Protocol	String	<ul style="list-style-type: none"> <li>• Condition: \$Input.Basic.ModeType &amp;&amp; \$Input.Basic.ModeType == “repeater”</li> </ul> Choices: <ul style="list-style-type: none"> <li>– ptpv2</li> </ul> <ul style="list-style-type: none"> <li>• No condition:</li> </ul> Choices: <ul style="list-style-type: none"> <li>– ptpv2</li> <li>– rtp</li> </ul>	Mode Protocol	Condition: (! \$Input.Basic.DisableRTM ) This attribute is required.

Table F-229 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SubProtocol	String	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Protocol &amp;&amp; \$Input.Basic.Protocol == "ptpv2"</li> <li>Choices: <ul style="list-style-type: none"> <li>- multicast</li> <li>- unicast</li> </ul> </li> <li>Condition: \$Input.Basic.ModeType &amp;&amp; \$Input.Basic.ModeType == "slave" &amp;&amp; \$Input.Basic.Protocol &amp;&amp; \$Input.Basic.Protocol == "rtp"</li> <li>Choices: <ul style="list-style-type: none"> <li>- cem</li> <li>- udp</li> <li>- virtual-cem</li> </ul> </li> <li>No condition: Choices: <ul style="list-style-type: none"> <li>- udp</li> </ul> </li> </ul>	Mode Sub - Protocol	Condition: (! \$Input.Basic.DisableRTM ) This attribute is required.
CEMSlotNum	Integer	Range: 0-2	CEM Slot Number	Condition: (! \$Input.Basic.DisableRTM ) && (\$Input.Basic.SubProtocol) && (\$Input.Basic.SubProtocol == "cem") This attribute is required.
CEMPortNum	Integer	Range: 0-15	CEM Port Number	Condition: (! \$Input.Basic.DisableRTM ) && (\$Input.Basic.SubProtocol) && (\$Input.Basic.SubProtocol == "cem") This attribute is required.
CEMGroupNum	Integer	Range: 0-2015	CEM Group Number	Condition: (! \$Input.Basic.DisableRTM ) && (\$Input.Basic.SubProtocol) && (\$Input.Basic.SubProtocol == "cem") This attribute is required

Table F-229 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
MasterProtocol	String	<ul style="list-style-type: none"> <li>Condition:                (\$Input.Basic.SubProtocol                &amp;&amp;                \$Input.Basic.SubProtocol ==                “unicast”)                               Choices:               <ul style="list-style-type: none"> <li>– multicast</li> <li>– unicast</li> </ul> </li> <li>No condition:                               Choices:               <ul style="list-style-type: none"> <li>– unicast</li> </ul> </li> </ul>	Master Side Protocol	Condition: (! \$Input.Basic.DisableRTM ) && (( \$Input.Basic.ModeType ) && (\$Input.Basic.ModeType == “repeater”) && (\$Input.Basic.SubProtocol)) && ( ! \$Input.Basic.NegMasterProtocol ) This attribute is required
Negotiation	Boolean		Negotiation	Condition: (! \$Input.Basic.DisableRTM ) && ( ( \$Input.Basic.SubProtocol && \$Input.Basic.SubProtocol == “unicast” && ! \$Input.Basic.MasterProtocol )    ( \$Input.Basic.SubProtocol && \$Input.Basic.SubProtocol == “multicast” && \$Input.Basic.MasterProtocol && \$Input.Basic.MasterProtocol == “unicast” ) )
NegMasterProtocol	String	Choices: <ul style="list-style-type: none"> <li>• multicast</li> <li>• unicast</li> </ul>	Negotiation Master Side Protocol	Condition: (! \$Input.Basic.DisableRTM ) && ( \$Input.Basic.ModeType ) && ( \$Input.Basic.ModeType == “repeater”) && ( \$Input.Basic.SubProtocol) && ( \$Input.Basic.SubProtocol == “unicast”) && ( \$Input.Basic.Negotiation ) && ( ! \$Input.Basic.MasterProtocol ) This attribute is required.
LocalInterface	String		Local Interface	Condition: (! \$Input.Basic.DisableRTM ) && (\$Input.Basic.SubProtocol) && (\$Input.Basic.SubProtocol != “cem” && \$Input.Basic.SubProtocol != “virtual-cem”) This attribute is required.

Table F-229 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PacketRate	Integer	<ul style="list-style-type: none"> <li>Condition: \$Input.Basic.Protocol &amp;&amp; \$Input.Basic.Protocol == “ptpv2” Range: 1-128</li> <li>No condition: Range: 1-2048</li> </ul>	Packet Rate (per sec)	Condition: (! \$Input.Basic.DisableRTM ) && (\$Input.Basic.ModeType && \$Input.Basic.Protocol && !( \$Input.Basic.ModeType == “slave” && \$Input.Basic.Protocol == “rtp”) ) This attribute is required.
ClockSourceIP	IPAddress		Clock Source IP Address	Condition: (! \$Input.Basic.DisableRTM ) && (\$Input.Basic.ModeType && \$Input.Basic.SubProtocol && !(\$Input.Basic.ModeType == “slave” && \$Input.Basic.SubProtocol == “multicast”))
ClockDestIP	IPAddress		Clock Destination IP Address	Condition: (! \$Input.Basic.DisableRTM ) This attribute is an array type.
TopEnable	Boolean		Enable Top	Condition: (! \$Input.Basic.DisableRTM)

## Feature: PTPV2



## Note

Condition: \$Input.Basic.Protocol && \$Input.Basic.Protocol == “ptpv2”

Table F-230 Feature: PTPV2

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
DomainNum	Integer	Range: 0-127	PTPV2 Domain Number	Condition: (! \$Input.Basic.DisableRTM )
PTPV2Ignore	Boolean		PTPV2 Ignore Steps Removed	Condition: (! \$Input.Basic.DisableRTM )
PTPV2TwoStep	Boolean		PTPV2 Twostep	Condition: (! \$Input.Basic.DisableRTM )

## Network Element Type: RecoveredClock

**Table F-231** Network Element Type: RecoveredClock

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Recovered Clock From	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

**Table F-232** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SlotNum	Integer	Range: 0-14	Slot Number	This attribute is required and is not modifiable.
SubSlotNum	Integer	Range: 0-3	Sub Slot Number	This attribute is required and is not modifiable.
ClockType	String	Choices: <ul style="list-style-type: none"> <li>• master</li> <li>• slave</li> </ul>	Clock Type	

### Feature: ClockGroup



**Note** This attribute group is an array type.

**Table F-233** Feature: ClockGroup

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
ClockID	Integer	Range: 0-23	Clock ID	This attribute is required and is not modifiable.
RecoveryClockType	String	Choices: <ul style="list-style-type: none"> <li>• adaptive</li> </ul>	Recovery Clock Type	This attribute is required.
CEMInterface	String		CEM Interface	This attribute is required.
CEMGroup	Integer	Range: 0-2015	CEM Group Number	This attribute is required.

## Network Element Type: SonetAU4

Table F-234 Network Element Type: SonetAU4

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Range: 1-1	AU4 Number	This attribute is required and is not modifiable.

### Feature: Basic



Note

This feature is required.

## Network Element Type: SonetAU4Tug

Table F-235 Network Element Type: SonetAU4Tug

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Range: 1-3	AU4 Tug 3 Number	This attribute is required and is not modifiable.

### Feature: Basic



Note

This feature is required.

Table F-236 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
ModeType	String		Mode Type	This attribute is not modifiable.

## Network Element Type: SonetCEMGroup

Table F-237 Network Element Type: SonetCEMGroup

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Controller	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-238**     *Feature: Basic*

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Controller	String		Controller	This attribute is required and is not modifiable.
VTGNumber	Integer	Range: 1-7	VTG Number	Condition: ! \$Input.Basic.TugNumber This attribute is required and is not modifiable.
VTGLineNumber	Integer	Range: 1-4	T1 Line Number	Condition: ! \$Input.Basic.TugNumber This attribute is required and is not modifiable.
TugNumber	Integer	Range: 1-7	Tug Number	Condition: ! \$Input.Basic.VTGNumber This attribute is required and is not modifiable.
TugLineNumber	Integer	Range: 1-3	E1 Line Number	Condition: ! \$Input.Basic.VTGNumber This attribute is required and is not modifiable.
Unframed	Boolean		Unframed	This attribute is not modifiable.
BeginTimeSlot	Integer	<ul style="list-style-type: none"> <li>No condition: Range: 1-24</li> <li>Condition: \$Input.Basic.TugNumber Range: 1-31</li> </ul>	Begin Time Slot	Condition: !\$Input.Basic.Unframed This attribute is required and is not modifiable.
EndTimeSlot	Integer	<ul style="list-style-type: none"> <li>No condition: <ul style="list-style-type: none"> <li>Range: 1-24</li> <li>Default Value: \$!Input.Basic.BeginTimeSlot</li> </ul> </li> <li>Condition: \$Input.Basic.TugNumber <ul style="list-style-type: none"> <li>Range: 1-31</li> <li>Default Value: \$!Input.Basic.BeginTimeSlot</li> </ul> </li> </ul>	End Time Slot	Condition: !\$Input.Basic.Unframed This attribute is not modifiable.

Table F-238 Feature: Basic (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
CEMClass	String	CEM Class		
DejitterBuffer	Integer	Range: 1-500	Dejitter Buffer (in ms)	
PayloadSize	Integer	Range: 32-1312	Payload Size	Condition: \$Node.DeviceType.startsWi th("Cisco76")
IdlePattern	String		Idle Pattern (in Hex 0-FF)	
DummyMode	String	Choices: <ul style="list-style-type: none"> <li>last-frame</li> <li>user-defined</li> </ul>	Dummy Mode	Condition: \$Node.DeviceType.startsWi th("Cisco76")
DummyPattern	String		Dummy Pattern (in Hex 0-FF)	Condition: \$Node.DeviceType.startsWi th("Cisco76")

## Feature: XConnect

Table F-239 Feature: XConnect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PeerIP	IPAddress		Peer IP Address	This attribute is required.
VCIDValue	Integer	Range: 1-4,294,967,295	VC ID	This attribute is required.
Encapsulation	String	<ul style="list-style-type: none"> <li>Condition: (\$Node.DeviceType.st artsWith("Cisco76") &amp;&amp; \$IOSVersion.GE("12. 2(33)SRC"))</li> <li>Choices: <ul style="list-style-type: none"> <li>mpls</li> <li>l2tpv3</li> </ul> </li> <li>No condition: Choices: <ul style="list-style-type: none"> <li>mpls</li> </ul> </li> </ul>	Encapsulation Type	
PWClass	String		Pseudowire Class	
SequencingType	String	Choices: <ul style="list-style-type: none"> <li>both</li> <li>transmit</li> <li>receive</li> </ul>	Sequencing Type	Condition: (\$Node.DeviceType.startsWi th("Cisco76") && \$IOSVersion.GE("12.2(33)SR C")) && ( ! \$Input.XConnect.PWClass)

Table F-239 Feature: XConnect (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
BackupPeerIP	IPAddress		Backup Peer IP Address	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
BackupVCIDValue	Integer	Range: 1-4,294,967,295	Backup VC ID	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
BackupPWClass	String		Backup Pseudowire Class	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
EnableDelay	Integer	Range: 0-180	Backup Enable Delay	
NeverDisable	Boolean		Never Disable	
DisableDelay	Integer	Range: 0-180	Backup Disable Delay	Condition: ( ! \$Input.XConnect.NeverDisable

## Network Element Type: SonetSTS

Table F-240 Network Element Type: SonetSTS

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Range: 1-3	STS 1 Number	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

Table F-241 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
ModeType	String		Mode Type	This attribute is not modifiable.

## Network Element Type: SonetTug

Table F-242 Network Element Type: SonetTug

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		Tug 2 Number / T1 Line Number	This attribute is required and is not modifiable.

### Feature: Basic



**Note**

This feature is required.

Table F-243 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
TugNumber	Integer	Range: 1-7	Tug Number	This attribute is required and is not modifiable.
TugLineNumber	Integer	Range: 1-4	Tug 2 Line Number	This attribute is required and is not modifiable.
Framing	String	Choices: <ul style="list-style-type: none"> <li>crc4 (default)</li> <li>no-crc4</li> <li>unframed</li> </ul>	Framing	This attribute is required.

### Feature: ClockSource

Table F-244 Feature: ClockSource

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	Choices: <ul style="list-style-type: none"> <li>Enhanced</li> <li>Internal</li> <li>Line</li> <li>Recovered</li> </ul>	Type	This attribute is required.
RecoveredClockID	Integer	Range: 0-23	Recovered Clock ID	Condition: \$Input.ClockSource.Type && \$Input.ClockSource.Type == "Recovered" This attribute is required.

## Network Element Type: SonetVTG

**Table F-245** Network Element Type: SonetVTG

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String		VTG Number / T1 Line Number	This attribute is required and is not modifiable.

### Feature: Basic



**Note** This feature is required.

**Table F-246** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
VTGNumber	Integer	Range: 1-7	VTG Number	This attribute is required and is not modifiable.
VTGLineNumber	Integer	Range: 1-4	VTG Line Number	This attribute is required and is not modifiable.
Framing	String	Choices: <ul style="list-style-type: none"> <li>SF</li> <li>ESF (default)</li> <li>unframed</li> </ul>	Framing	This attribute is required.

### Feature: ClockSource

**Table F-247** Feature: ClockSource

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Type	String	Choices: <ul style="list-style-type: none"> <li>Enhanced</li> <li>Internal</li> <li>Line</li> <li>Recovered</li> </ul>	Type	This attribute is required.
RecoveredClockID	Integer	Range: 0-23	Recovered Clock ID	Condition: \$Input.ClockSource.Type && \$Input.ClockSource.Type == "Recovered" This attribute is required.

## Network Element Type: TDMConnect

Table F-248 Network Element Type: TDMConnect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	String	Length: 1-15	Connection Name	This attribute is required and is not modifiable.

### Feature: Basic



**Note**

This feature is required.

Table F-249 Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
SrcInt	String		Source Interface	This attribute is required and is not modifiable.
SrcTDM	Integer	Range: 0-30	Source TDM Group ID	This attribute is required and is not modifiable.
DestInt	String		Destination Interface	This attribute is required and is not modifiable.
DestTDM	Integer	Range: 0-30	Destination TDM Group ID	This attribute is required and is not modifiable.

## Network Element Type: TDMGroup

Table F-250 Network Element Type: TDMGroup

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.Basic.Controller.startsWith("T1")</code> Range: 0-23</li> <li>No condition: Range: 0-30</li> </ul>	TDM Group Number	This attribute is required and is not modifiable.

## Feature: Basic



**Note**

This feature is required.

**Table F-251** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
Controller	String		Controller	This attribute is required and is not modifiable.
BeginTimeSlot	Integer	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.Basic.Controller.startsWith("T1")</code> Range: 1-24</li> <li>Condition: <code>\$Input.Basic.Controller.startsWith("E1")</code> Range: 1-31</li> </ul>	Begin Time Slot	This attribute is required.
EndTimeSlot	Integer	<ul style="list-style-type: none"> <li>Condition: <code>\$Input.Basic.Controller.startsWith("T1")</code> <ul style="list-style-type: none"> <li>Range: 1-24</li> <li>Default Value: <code>!Input.Basic.BeginTimeSlot</code></li> </ul> </li> <li>Condition: <code>\$Input.Basic.Controller.startsWith("E1")</code> <ul style="list-style-type: none"> <li>Range: 1-31</li> <li>Default Value: <code>!Input.Basic.BeginTimeSlot</code></li> </ul> </li> </ul>	End Time Slot	

## Network Element Type: VirtualCEMGroup

**Table F-252** Network Element Type: VirtualCEMGroup

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
RDN	Integer	Range: 0-63	CEM Group Number	This attribute is required and is not modifiable.

## Feature: Basic


**Note**

This feature is required.

**Table F-253** Feature: Basic

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
InterfaceName	String		Interface Name	
CEMClass	String		CEM Class	

## Feature: XConnect

**Table F-254** Feature: XConnect

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
PeerIP	IPAddress		Peer IP Address	This attribute is required.
VCIDValue	Integer	Range: 1-4,294,967,295	VC ID	This attribute is required.
Encapsulation	String	<ul style="list-style-type: none"> <li>Condition: (\$Node.DeviceType.startsWith("Cisco76") &amp;&amp; \$IOSVersion.GE("12.2(33)SRC"))</li> <li>Choices: <ul style="list-style-type: none"> <li>- mpls</li> <li>- l2tpv3</li> </ul> </li> <li>Condition: \$Node.DeviceType.startsWith("Cisco76")</li> <li>Choices: <ul style="list-style-type: none"> <li>- mpls</li> </ul> </li> </ul>	Encapsulation Type	
PWClass	String		Pseudowire Class	
SequencingType	String	Choices: <ul style="list-style-type: none"> <li>• both</li> <li>• transmit</li> <li>• receive</li> </ul>	Sequencing Type	Condition: (\$Node.DeviceType.startsWith("Cisco76") && \$IOSVersion.GE("12.2(33)SRC")) && (! \$Input.XConnect.PWClass)
BackupPeerIP	IPAddress		Backup Peer IP Address	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )

Table F-254 Feature: XConnect (continued)

Attribute Name	Type	Restriction(s)	GUI Display Name	Comments
BackupVCIDValue	Integer	Range: 1-4,294,967,295	Backup VC ID	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
BackupPWClass	String		Backup Pseudowire Class	Condition: ( \$Input.XConnect.Encapsulation ) && ( \$Input.XConnect.Encapsulation == "mpls" )
EnableDelay	Integer	Range: 0-180	Backup Enable Delay	
NeverDisable	Boolean		Never Disable	
DisableDelay	Integer	Range: 0-180	Backup Disable Delay	Condition: ( ! \$Input.XConnect.NeverDisable





## Northbound Trap Examples

### CISCO-EPM-NOTIFICATION MIB Traps

The following examples show some CISCO-EPM-NOTIFICATION-MIB traps that were generated by MWTM.

- [Example 1 — New Event, page G-1](#)
- [Example 2 — Updated Event Count, page G-3](#)
- [Example 3 — Acknowledged Event, page G-5](#)
- [Example 4 — Clear Event, page G-7](#)
- [Example 5 — Deleted Event, page G-9](#)

#### Example 1 — New Event

```
No.      Time      Source      Destination      Protocol  Info
   2  104.900222  172.18.126.237  172.18.175.72    SNMP      TRAP-V1
CISCO-EPM-NOTIFICATION-MIB::cenAlarmVersion.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmTimestamp.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmUpdatedTimestamp.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmInstanceID.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatus.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatusDefinition.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmType.0 CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategory.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategoryDefinition.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddressType.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddress.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectClass.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddressType.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddress.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmDescription.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverity.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverityDefinition.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmTriageValue.0
CISCO-EPM-NOTIFICATION-MIB::cenEventIDList.0 CISCO-EPM-NOTIFICATION-MIB::cenUserMessage1.0
CISCO-EPM-NOTIFICATION-MIB::cenUserMessage2.0
CISCO-EPM-NOTIFICATION-MIB::cenUserMessage3.0 CISCO-EPM-NOTIFICATION-MIB::cenAlarmMode.0
CISCO-EPM-NOTIFICATION-MIB::cenPartitionNumber.0
CISCO-EPM-NOTIFICATION-MIB::cenPartitionName.0
CISCO-EPM-NOTIFICATION-MIB::cenCustomerIdentification.0
CISCO-EPM-NOTIFICATION-MIB::cenCustomerRevision.0 CISCO-EPM-NOTIFICATION-MIB::cenAlertID.0
```

Frame 2 (1031 bytes on wire, 1031 bytes captured)

```

Ethernet II, Src: Cisco_10:ac:0a (00:07:ec:10:ac:0a), Dst: SunMicro_ec:e9:c1
(00:03:ba:ec:e9:c1)
Internet Protocol, Src: 172.18.126.237 (172.18.126.237), Dst: 172.18.175.72
(172.18.175.72)
User Datagram Protocol, Src Port: 48750 (48750), Dst Port: 45010 (45010)
Simple Network Management Protocol
  Version: 1 (0)
  Community: public
  PDU type: TRAP-V1 (4)
  Enterprise: 1.3.6.1.4.1.9.9.311 (CISCO-EPM-NOTIFICATION-MIB::ciscoEpmNotificationMIB)
  Agent address: 172.18.126.237 (172.18.126.237)
  Trap type: ENTERPRISE SPECIFIC (6)
  Specific trap type: 2
  Timestamp: 58789
  Object identifier 1: 1.3.6.1.4.1.9.9.311.1.1.2.1.2.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmVersion.0)
  Value: STRING:
  Object identifier 2: 1.3.6.1.4.1.9.9.311.1.1.2.1.3.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmTimestamp.0)
  Value: Timeticks: (58789) 0:09:47.89
  Object identifier 3: 1.3.6.1.4.1.9.9.311.1.1.2.1.4.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmUpdatedTimestamp.0)
  Value: Timeticks: (58789) 0:09:47.89
  Object identifier 4: 1.3.6.1.4.1.9.9.311.1.1.2.1.5.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmInstanceID.0)
  Value: STRING: 1409
  Object identifier 5: 1.3.6.1.4.1.9.9.311.1.1.2.1.6.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatus.0)
  Value: INTEGER: 0
  Object identifier 6: 1.3.6.1.4.1.9.9.311.1.1.2.1.7.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatusDefinition.0)
  Value: STRING: 0, New
  Object identifier 7: 1.3.6.1.4.1.9.9.311.1.1.2.1.8.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmType.0)
  Value: INTEGER: unknown(1)
  Object identifier 8: 1.3.6.1.4.1.9.9.311.1.1.2.1.9.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategory.0)
  Value: INTEGER: 1
  Object identifier 9: 1.3.6.1.4.1.9.9.311.1.1.2.1.10.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategoryDefinition.0)
  Value: STRING: 1,Trap
  Object identifier 10: 1.3.6.1.4.1.9.9.311.1.1.2.1.11.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddressType.0)
  Value: INTEGER: ipv4(1)
  Object identifier 11: 1.3.6.1.4.1.9.9.311.1.1.2.1.12.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddress.0)
  Value: STRING: "172.18.126.237"
  Object identifier 12: 1.3.6.1.4.1.9.9.311.1.1.2.1.13.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectClass.0)
  Value: STRING: ITP Node
  Object identifier 13: 1.3.6.1.4.1.9.9.311.1.1.2.1.14.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddressType.0)
  Value: INTEGER: ipv4(1)
  Object identifier 14: 1.3.6.1.4.1.9.9.311.1.1.2.1.15.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddress.0)
  Value: STRING: "172.18.17.16"
  Object identifier 15: 1.3.6.1.4.1.9.9.311.1.1.2.1.16.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmDescription.0)
  Value: STRING: "sgm-76-91a.cisco.com (clli_7691a) - Reported Fan state Warning on
Internal Chassis Fan."
  Object identifier 16: 1.3.6.1.4.1.9.9.311.1.1.2.1.17.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverity.0)
  Value: INTEGER: 5

```

```

Object identifier 17: 1.3.6.1.4.1.9.9.311.1.1.2.1.18.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverityDefinition.0)
Value: STRING: 5, Major
Object identifier 18: 1.3.6.1.4.1.9.9.311.1.1.2.1.19.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmTriageValue.0)
Value: INTEGER: 0
Object identifier 19: 1.3.6.1.4.1.9.9.311.1.1.2.1.20.0
(CISCO-EPM-NOTIFICATION-MIB::cenEventIDList.0)
Value: STRING: "1409"
Object identifier 20: 1.3.6.1.4.1.9.9.311.1.1.2.1.21.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage1.0)
Value: STRING: FanAlarm
Object identifier 21: 1.3.6.1.4.1.9.9.311.1.1.2.1.22.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage2.0)
Value: STRING: 2007-01-17,10:35:55.617,-0500
Object identifier 22: 1.3.6.1.4.1.9.9.311.1.1.2.1.23.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage3.0)
Value: STRING: 2007-01-17,10:35:55.617,-0500
Object identifier 23: 1.3.6.1.4.1.9.9.311.1.1.2.1.24.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmMode.0)
Value: INTEGER: alert(2)
Object identifier 24: 1.3.6.1.4.1.9.9.311.1.1.2.1.25.0
(CISCO-EPM-NOTIFICATION-MIB::cenPartitionNumber.0)
Value: Gauge32: 1
Object identifier 25: 1.3.6.1.4.1.9.9.311.1.1.2.1.26.0
(CISCO-EPM-NOTIFICATION-MIB::cenPartitionName.0)
Value: STRING: Node=sgm-76-91a.cisco.com-FanAlarm-1
Object identifier 26: 1.3.6.1.4.1.9.9.311.1.1.2.1.27.0
(CISCO-EPM-NOTIFICATION-MIB::cenCustomerIdentification.0)
Value: STRING: Node=sgm-76-91a.cisco.com
Object identifier 27: 1.3.6.1.4.1.9.9.311.1.1.2.1.28.0
(CISCO-EPM-NOTIFICATION-MIB::cenCustomerRevision.0)
Value: STRING:
Object identifier 28: 1.3.6.1.4.1.9.9.311.1.1.2.1.29.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlertID.0)
Value: STRING: 1409

```

## Example 2 — Updated Event Count

No.	Time	Source	Destination	Protocol	Info
3	143.147726	172.18.126.237	172.18.175.72	SNMP	TRAP-V1
CISCO-EPM-NOTIFICATION-MIB::cenAlarmVersion.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmTimestamp.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmUpdatedTimestamp.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmInstanceID.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatus.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatusDefinition.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmType.0 CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategory.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategoryDefinition.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddressType.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddress.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectClass.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddressType.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddress.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmDescription.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverity.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverityDefinition.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmTriageValue.0					
CISCO-EPM-NOTIFICATION-MIB::cenEventIDList.0 CISCO-EPM-NOTIFICATION-MIB::cenUserMessage1.0					
CISCO-EPM-NOTIFICATION-MIB::cenUserMessage2.0					
CISCO-EPM-NOTIFICATION-MIB::cenUserMessage3.0 CISCO-EPM-NOTIFICATION-MIB::cenAlarmMode.0					

```

CISCO-EPM-NOTIFICATION-MIB::cenPartitionNumber.0
CISCO-EPM-NOTIFICATION-MIB::cenPartitionName.0
CISCO-EPM-NOTIFICATION-MIB::cenCustomerIdentification.0
CISCO-EPM-NOTIFICATION-MIB::cenCustomerRevision.0 CISCO-EPM-NOTIFICATION-MIB::cenAlertID.0

Frame 3 (1034 bytes on wire, 1034 bytes captured)
Ethernet II, Src: Cisco_10:ac:0a (00:07:ec:10:ac:0a), Dst: SunMicro_ec:e9:c1
(00:03:ba:ec:e9:c1)
Internet Protocol, Src: 172.18.126.237 (172.18.126.237), Dst: 172.18.175.72
(172.18.175.72)
User Datagram Protocol, Src Port: 48750 (48750), Dst Port: 45010 (45010)
Simple Network Management Protocol
  Version: 1 (0)
  Community: public
  PDU type: TRAP-V1 (4)
  Enterprise: 1.3.6.1.4.1.9.9.311 (CISCO-EPM-NOTIFICATION-MIB::ciscoEpmNotificationMIB)
  Agent address: 172.18.126.237 (172.18.126.237)
  Trap type: ENTERPRISE SPECIFIC (6)
  Specific trap type: 2
  Timestamp: 62614
  Object identifier 1: 1.3.6.1.4.1.9.9.311.1.1.2.1.2.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmVersion.0)
  Value: STRING:
  Object identifier 2: 1.3.6.1.4.1.9.9.311.1.1.2.1.3.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmTimestamp.0)
  Value: Timeticks: (62614) 0:10:26.14
  Object identifier 3: 1.3.6.1.4.1.9.9.311.1.1.2.1.4.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmUpdatedTimestamp.0)
  Value: Timeticks: (62614) 0:10:26.14
  Object identifier 4: 1.3.6.1.4.1.9.9.311.1.1.2.1.5.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmInstanceID.0)
  Value: STRING: 1409
  Object identifier 5: 1.3.6.1.4.1.9.9.311.1.1.2.1.6.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatus.0)
  Value: INTEGER: 1
  Object identifier 6: 1.3.6.1.4.1.9.9.311.1.1.2.1.7.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatusDefinition.0)
  Value: STRING: 1, Update
  Object identifier 7: 1.3.6.1.4.1.9.9.311.1.1.2.1.8.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmType.0)
  Value: INTEGER: unknown(1)
  Object identifier 8: 1.3.6.1.4.1.9.9.311.1.1.2.1.9.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategory.0)
  Value: INTEGER: 1
  Object identifier 9: 1.3.6.1.4.1.9.9.311.1.1.2.1.10.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategoryDefinition.0)
  Value: STRING: 1, Trap
  Object identifier 10: 1.3.6.1.4.1.9.9.311.1.1.2.1.11.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddressType.0)
  Value: INTEGER: ipv4(1)
  Object identifier 11: 1.3.6.1.4.1.9.9.311.1.1.2.1.12.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddress.0)
  Value: STRING: "172.18.126.237"
  Object identifier 12: 1.3.6.1.4.1.9.9.311.1.1.2.1.13.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectClass.0)
  Value: STRING: ITP Node
  Object identifier 13: 1.3.6.1.4.1.9.9.311.1.1.2.1.14.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddressType.0)
  Value: INTEGER: ipv4(1)
  Object identifier 14: 1.3.6.1.4.1.9.9.311.1.1.2.1.15.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddress.0)
  Value: STRING: "172.18.17.16"
  Object identifier 15: 1.3.6.1.4.1.9.9.311.1.1.2.1.16.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmDescription.0)

```

```

Value: STRING: "sgm-76-91a.cisco.com (clli_7691a) - Reported Fan state Warning on
Internal Chassis Fan."
Object identifier 16: 1.3.6.1.4.1.9.9.311.1.1.2.1.17.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverity.0)
Value: INTEGER: 5
Object identifier 17: 1.3.6.1.4.1.9.9.311.1.1.2.1.18.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverityDefinition.0)
Value: STRING: 5,Major
Object identifier 18: 1.3.6.1.4.1.9.9.311.1.1.2.1.19.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmTriageValue.0)
Value: INTEGER: 0
Object identifier 19: 1.3.6.1.4.1.9.9.311.1.1.2.1.20.0
(CISCO-EPM-NOTIFICATION-MIB::cenEventIDList.0)
Value: STRING: "1409"
Object identifier 20: 1.3.6.1.4.1.9.9.311.1.1.2.1.21.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage1.0)
Value: STRING: FanAlarm
Object identifier 21: 1.3.6.1.4.1.9.9.311.1.1.2.1.22.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage2.0)
Value: STRING: 2007-01-17,10:35:55.617,-0500
Object identifier 22: 1.3.6.1.4.1.9.9.311.1.1.2.1.23.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage3.0)
Value: STRING: 2007-01-17,10:36:33.848,-0500
Object identifier 23: 1.3.6.1.4.1.9.9.311.1.1.2.1.24.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmMode.0)
Value: INTEGER: alert(2)
Object identifier 24: 1.3.6.1.4.1.9.9.311.1.1.2.1.25.0
(CISCO-EPM-NOTIFICATION-MIB::cenPartitionNumber.0)
Value: Gauge32: 2
Object identifier 25: 1.3.6.1.4.1.9.9.311.1.1.2.1.26.0
(CISCO-EPM-NOTIFICATION-MIB::cenPartitionName.0)
Value: STRING: Node=sgm-76-91a.cisco.com-FanAlarm-1
Object identifier 26: 1.3.6.1.4.1.9.9.311.1.1.2.1.27.0
(CISCO-EPM-NOTIFICATION-MIB::cenCustomerIdentification.0)
Value: STRING: Node=sgm-76-91a.cisco.com
Object identifier 27: 1.3.6.1.4.1.9.9.311.1.1.2.1.28.0
(CISCO-EPM-NOTIFICATION-MIB::cenCustomerRevision.0)
Value: STRING:
Object identifier 28: 1.3.6.1.4.1.9.9.311.1.1.2.1.29.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlertID.0)
Value: STRING: 1409

```

## Example 3 — Acknowledged Event

No.	Time	Source	Destination	Protocol	Info
4	148.624134	172.18.126.237	172.18.175.72	SNMP	TRAP-V1
CISCO-EPM-NOTIFICATION-MIB::cenAlarmVersion.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmTimestamp.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmUpdatedTimestamp.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmInstanceID.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatus.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatusDefinition.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmType.0 CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategory.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategoryDefinition.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddressType.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddress.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectClass.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddressType.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddress.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmDescription.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverity.0					

```

CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverityDefinition.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmTriageValue.0
CISCO-EPM-NOTIFICATION-MIB::cenEventIDList.0 CISCO-EPM-NOTIFICATION-MIB::cenUserMessage1.0
CISCO-EPM-NOTIFICATION-MIB::cenUserMessage2.0
CISCO-EPM-NOTIFICATION-MIB::cenUserMessage3.0 CISCO-EPM-NOTIFICATION-MIB::cenAlarmMode.0
CISCO-EPM-NOTIFICATION-MIB::cenPartitionNumber.0
CISCO-EPM-NOTIFICATION-MIB::cenPartitionName.0
CISCO-EPM-NOTIFICATION-MIB::cenCustomerIdentification.0
CISCO-EPM-NOTIFICATION-MIB::cenCustomerRevision.0 CISCO-EPM-NOTIFICATION-MIB::cenAlertID.0

```

```

Frame 4 (1044 bytes on wire, 1044 bytes captured)
Ethernet II, Src: Cisco_10:ac:0a (00:07:ec:10:ac:0a), Dst: SunMicro_ec:e9:c1
(00:03:ba:ec:e9:c1)
Internet Protocol, Src: 172.18.126.237 (172.18.126.237), Dst: 172.18.175.72
(172.18.175.72)
User Datagram Protocol, Src Port: 48750 (48750), Dst Port: 45010 (45010)
Simple Network Management Protocol
  Version: 1 (0)
  Community: public
  PDU type: TRAP-V1 (4)
  Enterprise: 1.3.6.1.4.1.9.9.311 (CISCO-EPM-NOTIFICATION-MIB::ciscoEpmNotificationMIB)
  Agent address: 172.18.126.237 (172.18.126.237)
  Trap type: ENTERPRISE SPECIFIC (6)
  Specific trap type: 2
  Timestamp: 63162
  Object identifier 1: 1.3.6.1.4.1.9.9.311.1.1.2.1.2.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmVersion.0)
  Value: STRING:
  Object identifier 2: 1.3.6.1.4.1.9.9.311.1.1.2.1.3.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmTimestamp.0)
  Value: Timeticks: (63162) 0:10:31.62
  Object identifier 3: 1.3.6.1.4.1.9.9.311.1.1.2.1.4.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmUpdatedTimestamp.0)
  Value: Timeticks: (63162) 0:10:31.62
  Object identifier 4: 1.3.6.1.4.1.9.9.311.1.1.2.1.5.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmInstanceID.0)
  Value: STRING: 1409
  Object identifier 5: 1.3.6.1.4.1.9.9.311.1.1.2.1.6.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatus.0)
  Value: INTEGER: 1
  Object identifier 6: 1.3.6.1.4.1.9.9.311.1.1.2.1.7.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatusDefinition.0)
  Value: STRING: 1, Update
  Object identifier 7: 1.3.6.1.4.1.9.9.311.1.1.2.1.8.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmType.0)
  Value: INTEGER: unknown(1)
  Object identifier 8: 1.3.6.1.4.1.9.9.311.1.1.2.1.9.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategory.0)
  Value: INTEGER: 1
  Object identifier 9: 1.3.6.1.4.1.9.9.311.1.1.2.1.10.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategoryDefinition.0)
  Value: STRING: 1, Trap
  Object identifier 10: 1.3.6.1.4.1.9.9.311.1.1.2.1.11.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddressType.0)
  Value: INTEGER: ipv4(1)
  Object identifier 11: 1.3.6.1.4.1.9.9.311.1.1.2.1.12.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddress.0)
  Value: STRING: "172.18.126.237"
  Object identifier 12: 1.3.6.1.4.1.9.9.311.1.1.2.1.13.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectClass.0)
  Value: STRING: ITP Node
  Object identifier 13: 1.3.6.1.4.1.9.9.311.1.1.2.1.14.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddressType.0)
  Value: INTEGER: ipv4(1)

```

```

Object identifier 14: 1.3.6.1.4.1.9.9.311.1.1.2.1.15.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddress.0)
Value: STRING: "172.18.17.16"
Object identifier 15: 1.3.6.1.4.1.9.9.311.1.1.2.1.16.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmDescription.0)
Value: STRING: "sgm-76-91a.cisco.com (cli_7691a) - Reported Fan state Warning on
Internal Chassis Fan."
Object identifier 16: 1.3.6.1.4.1.9.9.311.1.1.2.1.17.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverity.0)
Value: INTEGER: 5
Object identifier 17: 1.3.6.1.4.1.9.9.311.1.1.2.1.18.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverityDefinition.0)
Value: STRING: 5,Major
Object identifier 18: 1.3.6.1.4.1.9.9.311.1.1.2.1.19.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmTriageValue.0)
Value: INTEGER: 0
Object identifier 19: 1.3.6.1.4.1.9.9.311.1.1.2.1.20.0
(CISCO-EPM-NOTIFICATION-MIB::cenEventIDList.0)
Value: STRING: "1409"
Object identifier 20: 1.3.6.1.4.1.9.9.311.1.1.2.1.21.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage1.0)
Value: STRING: FanAlarm
Object identifier 21: 1.3.6.1.4.1.9.9.311.1.1.2.1.22.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage2.0)
Value: STRING: 2007-01-17,10:35:55.617,-0500
Object identifier 22: 1.3.6.1.4.1.9.9.311.1.1.2.1.23.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage3.0)
Value: STRING: 2007-01-17,10:36:41.331,-0500
Object identifier 23: 1.3.6.1.4.1.9.9.311.1.1.2.1.24.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmMode.0)
Value: INTEGER: alert(2)
Object identifier 24: 1.3.6.1.4.1.9.9.311.1.1.2.1.25.0
(CISCO-EPM-NOTIFICATION-MIB::cenPartitionNumber.0)
Value: Gauge32: 2
Object identifier 25: 1.3.6.1.4.1.9.9.311.1.1.2.1.26.0
(CISCO-EPM-NOTIFICATION-MIB::cenPartitionName.0)
Value: STRING: Node=sgm-76-91a.cisco.com-FanAlarm-1
Object identifier 26: 1.3.6.1.4.1.9.9.311.1.1.2.1.27.0
(CISCO-EPM-NOTIFICATION-MIB::cenCustomerIdentification.0)
Value: STRING: Node=sgm-76-91a.cisco.com
Object identifier 27: 1.3.6.1.4.1.9.9.311.1.1.2.1.28.0
(CISCO-EPM-NOTIFICATION-MIB::cenCustomerRevision.0)
Value: STRING: ems-svr453
Object identifier 28: 1.3.6.1.4.1.9.9.311.1.1.2.1.29.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlertID.0)
Value: STRING: 1409

```

## Example 4 — Clear Event

No.	Time	Source	Destination	Protocol	Info
5	160.493700	172.18.126.237	172.18.175.72	SNMP	TRAP-V1
CISCO-EPM-NOTIFICATION-MIB::cenAlarmVersion.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmTimestamp.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmUpdatedTimestamp.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmInstanceID.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatus.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatusDefinition.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmType.0 CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategory.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategoryDefinition.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddressType.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddress.0					

```

CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectClass.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddressType.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddress.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmDescription.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverity.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverityDefinition.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmTriageValue.0
CISCO-EPM-NOTIFICATION-MIB::cenEventIDList.0 CISCO-EPM-NOTIFICATION-MIB::cenUserMessage1.0
CISCO-EPM-NOTIFICATION-MIB::cenUserMessage2.0
CISCO-EPM-NOTIFICATION-MIB::cenUserMessage3.0 CISCO-EPM-NOTIFICATION-MIB::cenAlarmMode.0
CISCO-EPM-NOTIFICATION-MIB::cenPartitionNumber.0
CISCO-EPM-NOTIFICATION-MIB::cenPartitionName.0
CISCO-EPM-NOTIFICATION-MIB::cenCustomerIdentification.0
CISCO-EPM-NOTIFICATION-MIB::cenCustomerRevision.0 CISCO-EPM-NOTIFICATION-MIB::cenAlertID.0

```

```

Frame 5 (1031 bytes on wire, 1031 bytes captured)
Ethernet II, Src: Cisco_10:ac:0a (00:07:ec:10:ac:0a), Dst: SunMicro_ec:e9:c1
(00:03:ba:ec:e9:c1)
Internet Protocol, Src: 172.18.126.237 (172.18.126.237), Dst: 172.18.175.72
(172.18.175.72)
User Datagram Protocol, Src Port: 48750 (48750), Dst Port: 45010 (45010)
Simple Network Management Protocol
  Version: 1 (0)
  Community: public
  PDU type: TRAP-V1 (4)
  Enterprise: 1.3.6.1.4.1.9.9.311 (CISCO-EPM-NOTIFICATION-MIB::ciscoEpmNotificationMIB)
  Agent address: 172.18.126.237 (172.18.126.237)
  Trap type: ENTERPRISE SPECIFIC (6)
  Specific trap type: 2
  Timestamp: 64349
  Object identifier 1: 1.3.6.1.4.1.9.9.311.1.1.2.1.2.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmVersion.0)
  Value: STRING:
  Object identifier 2: 1.3.6.1.4.1.9.9.311.1.1.2.1.3.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmTimestamp.0)
  Value: Timeticks: (64349) 0:10:43.49
  Object identifier 3: 1.3.6.1.4.1.9.9.311.1.1.2.1.4.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmUpdatedTimestamp.0)
  Value: Timeticks: (64349) 0:10:43.49
  Object identifier 4: 1.3.6.1.4.1.9.9.311.1.1.2.1.5.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmInstanceID.0)
  Value: STRING: 1409
  Object identifier 5: 1.3.6.1.4.1.9.9.311.1.1.2.1.6.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatus.0)
  Value: INTEGER: 1
  Object identifier 6: 1.3.6.1.4.1.9.9.311.1.1.2.1.7.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatusDefinition.0)
  Value: STRING: 1, Update
  Object identifier 7: 1.3.6.1.4.1.9.9.311.1.1.2.1.8.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmType.0)
  Value: INTEGER: unknown(1)
  Object identifier 8: 1.3.6.1.4.1.9.9.311.1.1.2.1.9.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategory.0)
  Value: INTEGER: 1
  Object identifier 9: 1.3.6.1.4.1.9.9.311.1.1.2.1.10.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategoryDefinition.0)
  Value: STRING: 1, Trap
  Object identifier 10: 1.3.6.1.4.1.9.9.311.1.1.2.1.11.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddressType.0)
  Value: INTEGER: ipv4(1)
  Object identifier 11: 1.3.6.1.4.1.9.9.311.1.1.2.1.12.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddress.0)
  Value: STRING: "172.18.126.237"

```

```

Object identifier 12: 1.3.6.1.4.1.9.9.311.1.1.2.1.13.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectClass.0)
Value: STRING: ITP Node
Object identifier 13: 1.3.6.1.4.1.9.9.311.1.1.2.1.14.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddressType.0)
Value: INTEGER: ipv4(1)
Object identifier 14: 1.3.6.1.4.1.9.9.311.1.1.2.1.15.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddress.0)
Value: STRING: "172.18.17.16"
Object identifier 15: 1.3.6.1.4.1.9.9.311.1.1.2.1.16.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmDescription.0)
Value: STRING: "sgm-76-91a.cisco.com - Reported Fan state Normal on Internal Chassis
Fan."
Object identifier 16: 1.3.6.1.4.1.9.9.311.1.1.2.1.17.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverity.0)
Value: INTEGER: 0
Object identifier 17: 1.3.6.1.4.1.9.9.311.1.1.2.1.18.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverityDefinition.0)
Value: STRING: 0,Normal
Object identifier 18: 1.3.6.1.4.1.9.9.311.1.1.2.1.19.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmTriageValue.0)
Value: INTEGER: 0
Object identifier 19: 1.3.6.1.4.1.9.9.311.1.1.2.1.20.0
(CISCO-EPM-NOTIFICATION-MIB::cenEventIDList.0)
Value: STRING: "1409"
Object identifier 20: 1.3.6.1.4.1.9.9.311.1.1.2.1.21.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage1.0)
Value: STRING: FanAlarm
Object identifier 21: 1.3.6.1.4.1.9.9.311.1.1.2.1.22.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage2.0)
Value: STRING: 2007-01-17,10:35:55.617,-0500
Object identifier 22: 1.3.6.1.4.1.9.9.311.1.1.2.1.23.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage3.0)
Value: STRING: 2007-01-17,10:36:51.205,-0500
Object identifier 23: 1.3.6.1.4.1.9.9.311.1.1.2.1.24.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmMode.0)
Value: INTEGER: alert(2)
Object identifier 24: 1.3.6.1.4.1.9.9.311.1.1.2.1.25.0
(CISCO-EPM-NOTIFICATION-MIB::cenPartitionNumber.0)
Value: Gauge32: 3
Object identifier 25: 1.3.6.1.4.1.9.9.311.1.1.2.1.26.0
(CISCO-EPM-NOTIFICATION-MIB::cenPartitionName.0)
Value: STRING: Node=sgm-76-91a.cisco.com-FanAlarm-1
Object identifier 26: 1.3.6.1.4.1.9.9.311.1.1.2.1.27.0
(CISCO-EPM-NOTIFICATION-MIB::cenCustomerIdentification.0)
Value: STRING: Node=sgm-76-91a.cisco.com
Object identifier 27: 1.3.6.1.4.1.9.9.311.1.1.2.1.28.0
(CISCO-EPM-NOTIFICATION-MIB::cenCustomerRevision.0)
Value: STRING: ems-svr453
Object identifier 28: 1.3.6.1.4.1.9.9.311.1.1.2.1.29.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlertID.0)
Value: STRING: 1409

```

## Example 5 — Deleted Event

No.	Time	Source	Destination	Protocol	Info
6	223.839602	172.18.126.237	172.18.175.72	SNMP	TRAP-V1
CISCO-EPM-NOTIFICATION-MIB::cenAlarmVersion.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmTimestamp.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmUpdatedTimestamp.0					
CISCO-EPM-NOTIFICATION-MIB::cenAlarmInstanceID.0					

```

CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatus.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatusDefinition.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmType.0 CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategory.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategoryDefinition.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddressType.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddress.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectClass.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddressType.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddress.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmDescription.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverity.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverityDefinition.0
CISCO-EPM-NOTIFICATION-MIB::cenAlarmTriageValue.0
CISCO-EPM-NOTIFICATION-MIB::cenEventIDList.0 CISCO-EPM-NOTIFICATION-MIB::cenUserMessage1.0
CISCO-EPM-NOTIFICATION-MIB::cenUserMessage2.0
CISCO-EPM-NOTIFICATION-MIB::cenUserMessage3.0 CISCO-EPM-NOTIFICATION-MIB::cenAlarmMode.0
CISCO-EPM-NOTIFICATION-MIB::cenPartitionNumber.0
CISCO-EPM-NOTIFICATION-MIB::cenPartitionName.0
CISCO-EPM-NOTIFICATION-MIB::cenCustomerIdentification.0
CISCO-EPM-NOTIFICATION-MIB::cenCustomerRevision.0 CISCO-EPM-NOTIFICATION-MIB::cenAlertID.0

```

```

Frame 6 (1031 bytes on wire, 1031 bytes captured)
Ethernet II, Src: Cisco_10:ac:0a (00:07:ec:10:ac:0a), Dst: SunMicro_ec:e9:c1
(00:03:ba:ec:e9:c1)
Internet Protocol, Src: 172.18.126.237 (172.18.126.237), Dst: 172.18.175.72
(172.18.175.72)
User Datagram Protocol, Src Port: 48750 (48750), Dst Port: 45010 (45010)
Simple Network Management Protocol
  Version: 1 (0)
  Community: public
  PDU type: TRAP-V1 (4)
  Enterprise: 1.3.6.1.4.1.9.9.311 (CISCO-EPM-NOTIFICATION-MIB::ciscoEpmNotificationMIB)
  Agent address: 172.18.126.237 (172.18.126.237)
  Trap type: ENTERPRISE SPECIFIC (6)
  Specific trap type: 2
  Timestamp: 70684
  Object identifier 1: 1.3.6.1.4.1.9.9.311.1.1.2.1.2.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmVersion.0)
  Value: STRING:
  Object identifier 2: 1.3.6.1.4.1.9.9.311.1.1.2.1.3.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmTimestamp.0)
  Value: Timeticks: (70684) 0:11:46.84
  Object identifier 3: 1.3.6.1.4.1.9.9.311.1.1.2.1.4.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmUpdatedTimestamp.0)
  Value: Timeticks: (70684) 0:11:46.84
  Object identifier 4: 1.3.6.1.4.1.9.9.311.1.1.2.1.5.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmInstanceID.0)
  Value: STRING: 1409
  Object identifier 5: 1.3.6.1.4.1.9.9.311.1.1.2.1.6.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatus.0)
  Value: INTEGER: 2
  Object identifier 6: 1.3.6.1.4.1.9.9.311.1.1.2.1.7.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmStatusDefinition.0)
  Value: STRING: 2, Delete
  Object identifier 7: 1.3.6.1.4.1.9.9.311.1.1.2.1.8.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmType.0)
  Value: INTEGER: unknown(1)
  Object identifier 8: 1.3.6.1.4.1.9.9.311.1.1.2.1.9.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategory.0)
  Value: INTEGER: 1
  Object identifier 9: 1.3.6.1.4.1.9.9.311.1.1.2.1.10.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmCategoryDefinition.0)
  Value: STRING: 1,Trap

```

```

Object identifier 10: 1.3.6.1.4.1.9.9.311.1.1.2.1.11.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddressType.0)
Value: INTEGER: ipv4(1)
Object identifier 11: 1.3.6.1.4.1.9.9.311.1.1.2.1.12.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmServerAddress.0)
Value: STRING: "172.18.126.237"
Object identifier 12: 1.3.6.1.4.1.9.9.311.1.1.2.1.13.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectClass.0)
Value: STRING: ITP Node
Object identifier 13: 1.3.6.1.4.1.9.9.311.1.1.2.1.14.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddressType.0)
Value: INTEGER: ipv4(1)
Object identifier 14: 1.3.6.1.4.1.9.9.311.1.1.2.1.15.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmManagedObjectAddress.0)
Value: STRING: "172.18.17.16"
Object identifier 15: 1.3.6.1.4.1.9.9.311.1.1.2.1.16.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmDescription.0)
Value: STRING: "sgm-76-91a.cisco.com - Reported Fan state Normal on Internal Chassis
Fan."
Object identifier 16: 1.3.6.1.4.1.9.9.311.1.1.2.1.17.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverity.0)
Value: INTEGER: 0
Object identifier 17: 1.3.6.1.4.1.9.9.311.1.1.2.1.18.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmSeverityDefinition.0)
Value: STRING: 0,Normal
Object identifier 18: 1.3.6.1.4.1.9.9.311.1.1.2.1.19.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmTriageValue.0)
Value: INTEGER: 0
Object identifier 19: 1.3.6.1.4.1.9.9.311.1.1.2.1.20.0
(CISCO-EPM-NOTIFICATION-MIB::cenEventIDList.0)
Value: STRING: "1409"
Object identifier 20: 1.3.6.1.4.1.9.9.311.1.1.2.1.21.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage1.0)
Value: STRING: FanAlarm
Object identifier 21: 1.3.6.1.4.1.9.9.311.1.1.2.1.22.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage2.0)
Value: STRING: 2007-01-17,10:35:55.617,-0500
Object identifier 22: 1.3.6.1.4.1.9.9.311.1.1.2.1.23.0
(CISCO-EPM-NOTIFICATION-MIB::cenUserMessage3.0)
Value: STRING: 2007-01-17,10:36:51.205,-0500
Object identifier 23: 1.3.6.1.4.1.9.9.311.1.1.2.1.24.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlarmMode.0)
Value: INTEGER: alert(2)
Object identifier 24: 1.3.6.1.4.1.9.9.311.1.1.2.1.25.0
(CISCO-EPM-NOTIFICATION-MIB::cenPartitionNumber.0)
Value: Gauge32: 3
Object identifier 25: 1.3.6.1.4.1.9.9.311.1.1.2.1.26.0
(CISCO-EPM-NOTIFICATION-MIB::cenPartitionName.0)
Value: STRING: Node=sgm-76-91a.cisco.com-FanAlarm-1
Object identifier 26: 1.3.6.1.4.1.9.9.311.1.1.2.1.27.0
(CISCO-EPM-NOTIFICATION-MIB::cenCustomerIdentification.0)
Value: STRING: Node=sgm-76-91a.cisco.com
Object identifier 27: 1.3.6.1.4.1.9.9.311.1.1.2.1.28.0
(CISCO-EPM-NOTIFICATION-MIB::cenCustomerRevision.0)
Value: STRING: ems-svr453
Object identifier 28: 1.3.6.1.4.1.9.9.311.1.1.2.1.29.0
(CISCO-EPM-NOTIFICATION-MIB::cenAlertID.0)
Value: STRING: 1409

```





## SOAP Message Examples

---

This appendix lists the Simple Object Access Protocol (SOAP) message examples that are transmitted.

- [SOAP Request, page H-1](#)
- [SOAP Response, page H-1](#)
- [SOAP Fault, page H-2](#)

### SOAP Request

An MWTM 6.1 SOAP request is sent as an HTTP POST operation. The following example is a SOAP request message that a client is requesting to get a note for event ID 1000:

```
POST /nbapi/event HTTP/1.1
Content-Length: 309
SOAPAction: ""
Content-Type: text/xml;charset=utf-8
Host: ems-sv258:1774
Connection: Keep-Alive

<?xml version="1.0" ?>
<soapenv:Envelope
  xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:ns1="http://cisco.com/mwtm">
  <soapenv:Body>
    <ans:getNote xmlns:ans="http://cisco.com/mwtm">
      <eventID>1000</eventID>
    </ans:getNote>
  </soapenv:Body>
</soapenv:Envelope>
```

### SOAP Response

An MWTM 6.1 SOAP response is received by the requester as an HTTP response.

The following example is a SOAP response message that a server is responding to get a note request with the attached note:

```
HTTP/1.1 200 OK
Date: Fri, 14 Apr 2006 02:15:17 GMT
Server: Apache/1.3.32 (Unix) mod_jk/1.2.6
```

```

SOAPAction: ""
Content-Length: 330
Connection: Keep-Alive
Content-Type: text/xml; charset=utf-8

<?xml version="1.0" ?>
<soapenv:Envelope
  xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:ns1="http://cisco.com/mwmt">
  <soapenv:Body>
    <ans:getNoteResponse xmlns:ans="http://cisco.com/mwmt">
      <note>An example note</note>
    </ans:getNoteResponse>
  </soapenv:Body>
</soapenv:Envelope>

```

## SOAP Fault

A SOAP fault indicates that an error has occurred when fulfilling the requested operation. The following example is a SOAP fault message that a server is responding with when an unexpected error has occurred:

```

HTTP/1.1 500 Internal Server Error
Date: Fri, 14 Apr 2006 02:34:55 GMT
Server: Apache/1.3.32 (Unix) mod_jk/1.2.6
SOAPAction: ""
Content-Length: 533
Connection: close
Content-Type: text/xml; charset=utf-8

<?xml version="1.0" ?>
<soapenv:Envelope
  xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema"
  xmlns:ns1="http://cisco.com/mwmt">
  <soapenv:Body>
    <soapenv:Fault
      xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/">
      <faultcode>soapenv:Server</faultcode>
      <faultstring>UNEXPECTED_ERROR</faultstring>
      <detail>
        <ns1:APIStatus>
          <StatusCode>1000</StatusCode>
          <Message>UNEXPECTED_ERROR : test </Message>
        </ns1:APIStatus>
      </detail>
    </soapenv:Fault>
  </soapenv:Body>
</soapenv:Envelope>

```

In this fault message, the SOAP faultcode is **soapenv:Server**. This SOAP fault includes detailed content: an **APIException** element, which includes an **APIStatus** data type. **APIStatus** error code is 1, with a detailed message of **UNEXPECTED\_ERROR : text**.



### Note

**APIException** and **APIStatus** are defined in the MWTM 6.1 NAPI WSDL/XSD definitions (see [Appendix A, "MWTM 6.1 NAPI WSDL and XSD Definitions"](#)).



## MWTM 6.1 NBAPI Integration for Java Developers

---

The following sections describe the procedures needed to integrate MWTM 6.1 NBAPI into OSS applications:

- [Integrating the MWTM 6.1 NBAPI Into OSS Applications, page I-1](#)
- [Example Application Procedure, page I-8](#)

### Integrating the MWTM 6.1 NBAPI Into OSS Applications

#### Procedure

---

- Step 1** Download and install the latest version of Sun Java Developer Kit (JDK) 1.6 from the Sun Developer Network (SDN) website at <http://java.sun.com/index.jsp>.
- Step 2** Get the WSDL files and XSD files from the MWTM 6.1 server and save them into a directory. For the location of these files, see [Appendix A, “MWTM 6.1 NBAPI WSDL and XSD Definitions”](#).
- Step 3** Use the **wsimport** tool included in the JDK to generate the Java source code from the WSDL files. The command to run this tool should be similar to this (see [Example Application Procedure, page I-8](#)):

```
wsimport -d output -verbose -b C:\WSDL\Inventory.xsd C:\WSDL\InventoryAPI.wsdl
```

Refer to the help documentation for **wsimport** (see the Java website located at <http://java.sun.com/javase/6/docs/technotes/tools/share/wsimport.html> for more information).

- Step 4** Write your own MWTM 6.1 NBAPI Service classes. For example, if you need to call Event APIs, you should create an **EventAPIService** class. Likewise, for Inventory APIs, you should create an **InventoryAPIService** class and a **ProvisionAPIService** class for Provision APIs. At least two methods should be included in those classes:
- One is for the constructor.
  - The other is for the **getFunctionAPIPort** (you replace the Function with Event, Inventory, or Provision).
- You can freely name these classes as you like (see the [“MWTMEventAPIService.java”](#) section on [page I-2](#)).
- Step 5** In your application source code, at places where you need to call the MWTM 6.1 NBAPI:
- a. Create an instance object of the service class that you just created.

- b. Call the `getFunctionAPIPort` method of the service instance object to get the Function API access point object.
- c. Directly call the specific API you want on the API access point object (see “[GetFilteredEvents.java](#)” section on page I-3).

**Step 6** If the NBAPI calling involves some complex data structure objects defined in the XSD files, you have two ways to provide these objects. You can either:

- Manually construct these objects by following the specification in the generated source code.
- Use the Java XML Binding (JAXB) to convert the XML files to these objects. For more information, see the JAXB documentation located at <http://java.sun.com/webservices/docs/2.0/tutorial/doc/> or see the “[GetFilteredEvents.java](#)” section on page I-3.

**Step 7** Build and run your application (see [Example Application Procedure](#), page I-8).

---

## Example Code

In the following example, one small application is provided to show how to activate one API, `getFilteredEventsAsTraps`, in the Event category.

Two Java classes are included in this example:

- The [MWTMEventAPIService.java](#) class, which is for the API service.
- The [GetFilteredEvents.java](#) class, which is for the application entry point.

### MWTMEventAPIService.java

```

/*****
** Copyright (c) 2006 Cisco Systems, Inc. All rights reserved.
*****/
package com.samplecom.mwtm.sample;

import java.net.URL;
import javax.xml.namespace.QName;
import javax.xml.ws.Service;

import com.cisco.mwtm.nbapi.EventAPI;

/**
 * MWTM Event API Service Class.
 *
 * MWTMEventAPIService objects provide the client view of a MWTM Event
 * Web service.
 * <p>
 * MWTMEventAPIService acts as a factory of the following:
 * <ul>
 * <li> Proxies for MWTM Event service endpoint.
 * <li> Dynamic invocation of remote operations provided by MWTM Event
 * service.
 * </ul>
 *
 * @author Yanlin Hou
 * @version 1.0
 */
public class MWTMEventAPIService extends Service {

```

```

/* Qualified Name for Event Service defined in
 * MWTM Web Service Specification */
private final static QName EVENTAPISERVICE =
    new QName("http://cisco.com/mwtm", "EventAPIService");
/* Qualified Name for Event API Access Port defined in
 * MWTM Web Service Specification */
private final static QName EVENTAPIPORT =
    new QName("http://cisco.com/mwtm", "EventAPIPort");

/**
 * MWTMEventAPIService Constructor
 * The parameter for this method is like
 * http://MWTM-SERVER-NAME-OR-IPADDR:EVENT-SERVICE-
 * PORT/nbapi/event?wsdl
 * for example: http://localhost:1774/nbapi/event?wsdl
 *
 * @param wsdlLocation The URL of MWTM Event Service
 */
public MWTMEventAPIService(URL wsdlLocation) {
    super(wsdlLocation, EVENTAPISERVICE);
}

/**
 * Retrives MWTM Event API Port
 *
 * @return EventAPI object for Event Service Invocation
 */
public EventAPI getEventAPIPort() {
    return (EventAPI)super.getPort(EVENTAPIPORT, EventAPI.class);
}
}

```

## GetFilteredEvents.java

```

/*****
 ** Copyright (c) 2006 Cisco Systems, Inc. All rights reserved.
 *****/
package com.samplecom.mwtm.sample;

import java.net.URL;
import java.net.MalformedURLException;
import java.io.File;
import java.io.FileInputStream;

import javax.xml.XMLConstants;
import javax.xml.bind.JAXBContext;
import javax.xml.bind.JAXBElement;
import javax.xml.bind.JAXBException;
import javax.xml.bind.Unmarshaller;
import javax.xml.validation.SchemaFactory;

import com.cisco.mwtm.nbapi.APIStatus;
import com.cisco.mwtm.nbapi.APIStatus_Exception;
import com.cisco.mwtm.nbapi.EventAPI;
import com.cisco.mwtm.nbapi.EventFilter;
import com.cisco.mwtm.nbapi.TrapTarget;

/**
 * This Class demos how to call MWTM Event service

```

```

* to invoke the API getFilteredEventsAsTraps.
* <p>
* To use MWTM NBAPI, first thing is to get all the
* necessary WSDL and XSD files mentioned in the NBAPI
* specification documentation and use Java WS wsimport tool
* to generate the corresponding Java source files;
* Next create your own API service class, for example, for Event API,
* create EventAPIService, see the example MWTMEventAPIService.
* Next create an instance of the API Service you just created and
* get the service access port, for example, here EventAPI.
* Finally call the specific API you are interested through the
* service access port.
*
* In this example, we try to call getFilteredEventsAsTraps API
* in MWTM Event NBAPI. Users need to provide three parameters:
* <ul>
* <li> MWTM Server Name or IP Address and Web Service Port Number;
* <li> Event Filter Description XML File Name;
* <li> Event Trap Target Description XML File Name;
* </ul>
* The result will either show this call successful (how many events
* got sent out) or failed (Error Code and Error Message).
*
* @author Yanlin Hou
* @version 1.0
*
*/
public class GetFilteredEvents
{
    /**
     * Normal Exit Code
     */
    public static final int NORMAL_EXIT = 0;
    /**
     * Error Exit Code
     */
    public static final int ERROR_EXIT = 1;
    /**
     * Default MWTM Web Service Port Number
     */
    public static final String DEFAULT_NBAPI_PORT = "1774";

    /**
     * Application main entry point
     *
     * Three parameters are required:
     * <ul>
     * <li> MWTM Server Name or IP Address and Web Service Port
     *     Number;
     * <li> Event Filter Description XML File Name;
     * <li> Event Trap Target Description XML File Name;
     * </ul>
     * @param args
     */
    public static void main(String[] args)
    {
        // Check whether input parameters meet the requirement
        if (args.length != 3) {
            printHelpMessage();
            System.exit(ERROR_EXIT);
        }

        // Record all three parameters

```

```

String serverInfo = args[0];
String eventFilterFile = args[1];
String eventTrapTargetFile = args[2];

// Check whether the Event Filter XML file exists
if (!(new File(eventFilterFile).exists())) {
    System.err.println("Event Filter XML file " + eventFilterFile
        + " does not exist");
    System.err.println("Check your event filter file
        input");
    printHelpMessage();
    System.exit(ERROR_EXIT);
}

// Check whether the Trap Target XML file exists
if (!(new File(eventTrapTargetFile).exists())) {
    System.err.println("Event Trap Target XML file "
        + eventTrapTargetFile+ " does not exist");
    System.err.println("Check your event trap target file input");
    printHelpMessage();
    System.exit(ERROR_EXIT);
}

// Create the URL String of Event WSDL location
String wsdlLocation = "http://";
if (serverInfo.indexOf(':') == -1) {
    wsdlLocation += serverInfo + ":" + DEFAULT_NBAPI_PORT;
}
else {
    wsdlLocation += serverInfo;
}

wsdlLocation += "/nbapi/event?wsdl";

// Event API Access Port
EventAPI eventAPI = null;

try {
    eventAPI = new MWTMEventAPIService(
        new URL(wsdlLocation)).getEventAPIPort();
}
catch (MalformedURLException e) {
    System.err.println("WSDL Location " + wsdlLocation
        + " causing MalformedURLException");
    System.err.println("Check your server information input");
    printHelpMessage();
    System.exit(ERROR_EXIT);
}

/* Event Filter Object for one getFilteredEventsAsTraps parameter */
EventFilter eventFilter = null;
TrapTarget trapTarget = null;

/*
 * Here the following we use JAXB to convert XML file to
 * object. Please see corresponding documentation.
 */
try {
    JAXBContext jaxbContext = JAXBContext.
        newInstance("com.cisco.mwtm.nbapi");
    Unmarshaller unmarshaller =
        jaxbContext.createUnmarshaller();
    /* to validate whether provided XML meets the format
    * specification

```

```

        * defined in MWTM NBAPI Schema
        */
        URL schemaURL = new URL(wsdlLocation.
            substring(0,
wsdlLocation.lastIndexOf("wsdl") + "xsd=2");
        unmarshaller.setSchema(SchemaFactory.
newInstance(XMLConstants.W3C_XML_SCHEMA_NS_URI).
newSchema(schemaURL));
        JAXBElement<?> element = (JAXBElement<?>)
unmarshaller.unmarshal(new FileInputStream(eventFilterFile));
        eventFilter = (EventFilter)element.getValue();

        element = (JAXBElement<?>) unmarshaller.
            unmarshal(new
FileInputStream(eventTrapTargetFile));
        trapTarget = (TrapTarget)element.getValue();

    }
    catch (JAXBException je) {
        System.err.println("JAXBException happended during "
+"converting XML file to Object");
        System.err.println("Check your event filter or trap
target" + " file input");
        printHelpMessage();
        System.exit(ERROR_EXIT);
    }
    catch (Exception e) {
        System.err.println("Unexpected exception happened "
+ e.toString());
        printHelpMessage();
        System.exit(ERROR_EXIT);
    }

    System.out.println("Sending getFilteredEventsAsTraps " +
        "to the server ...");
    try {
        //Here is the API calling
        int numOfFilteredEvents = eventAPI.
            getFilteredEventsAsTraps(trapTarget, eventFilter);
        System.out.println("getFilteredEventsAsTraps " +
            "calling successful: " + numOfFilteredEvents
            + " events have been sent out as traps");
        System.out.println("Check trap receiver described by
"+ eventTrapTargetFile);
    }
    catch (APIStatus_Exception e) {
        APIStatus apiStatus = e.getFaultInfo();
        System.err.println("APIStatus_Exception happened " +
            "during NBAPI getFilteredEventsAsTraps calling");
        System.err.println("Error code is "
            + apiStatus.getStatusCode() + " error message is "
            + apiStatus.getMessage());
        System.exit(ERROR_EXIT);
    }
    System.exit(NORMAL_EXIT);
}

/**
 * Print the help message for this applcation.
 */
public static void printHelpMessage() {
    System.out.println("\nUsage Information:\n");
    System.out.println("GetFilterEvents MWTM-SERVER-INFO " +

```

```

        "EVENT-FILTER-FILENAME EVENT-TRAP-TARGET-FILENAME");
System.out.println("\tMWTM-SERVER-INFO: provide the destination" +
    " mwtm server information");
System.out.println("\t Format is like: " +
    "SERVER-NAME-OR-IPADDRESS[:NBAPI-SERVICE-PORTNUM]");
System.out.println("\t      NBAPI-SERVICE-PORTNUM is optional," +
    " if not provide, " + DEFAULT_NBAPI_PORT + " will be used");
System.out.println("\tEVENT-FILTER-FILENAME: " +
    "provide the event filter xml file path");
System.out.println("\t such file content should follow " +
    "the schema of EventFilter");
System.out.println("\tEVENT-TRAP-TARGET-FILENAME: " +
    "provide the event trap target xml file path");
System.out.println("\t such file content should follow " +
    "the schema of TrapTarget");
System.out.println();
    }
}

```

## XML Files

There are two additional XML files you need to call the API:

- [The eventFilter.xml File](#)
- [The eventTrapTarget.xml File](#)

### The eventFilter.xml File

```

<?xml version="1.0"?>
<ns:EventFilter xmlns:ns="http://cisco.com/mwtm">
  <Severity>Warning</Severity>
  <Severity>Minor</Severity>
  <Severity>Major</Severity>
  <Severity>Critical</Severity>
  <Severity>Informational</Severity>
  <Category>Status</Category>
  <Category>Discover</Category>
  <Category>Delete</Category>
  <Acknowledged>>false</Acknowledged>
</ns:EventFilter>

```

### The eventTrapTarget.xml File

```

<?xml version="1.0"?>
<ns:TrapTarget xmlns:ns="http://cisco.com/mwtm">
  <Hostname>TRAP_DESTINATION</Hostname>
  <Port>162</Port>
  <Community>2cepm</Community>
  <SNMPVersion>2c</SNMPVersion>
  <MTB>CISCO-EPM</MTB>
</ns:TrapTarget>

```



#### Note

In this example, replace **TRAP\_DESTINATION** with the trap receiver hostname or IP address.

# Example Application Procedure

The following procedure shows you how to build an example application. This example assumes that:

- JAVA\_Home is the JDK installation directory.
- MWTM\_SCHEMA is the directory that holds the saved WSDL and XSD files.
- APP\_SRC is the application sources code directory.
- APP\_CLASSES is the application classes directory.
- MWTM\_Server is the name of the IP address of the MWTM 6.1 server.

## Procedure

**Step 1** Run the **wsmimport** command to generate the Java source code from the WSDL/XSD files.

For the Solaris/Linux platform, run the command like this:

```
$JAVA_HOME/bin/wsmimport -s $APP_SRC -d $APP_CLASSES -p com.cisco.mwtm.nbapi
$MWTM_SCHEMA/EventAPI.wsdl
```

For the Windows platform, run the command like this:

```
%JAVA_HOME%\bin\wsmimport.bat -s %APP_SRC% -d %APP_CLASSES% -p com.cisco.mwtm.nbapi
%MWTM_SCHEMA%\EventAPI.wsdl
```

After wsmimport finishes, under the APP\_SRC and APP\_CLASSES, you will see that new files have been generated and the directory structure looks like either:

- com/cisco/mwtm/nbapi (for the Solaris or Linux platform)
- com\cisco\mwtm\nbapi (for the Windows platform)

**Step 2** Compile the Java source code.

For Solaris/Linux platform, run the command like this:

```
$JAVA_HOME/bin/javac -sourcepath $APP_SRC -d $APP_CLASSES -Xlint:deprecation
$APP_SRC/com/cisco/mwtm/nbapi/*.java $APP_SRC/com/samplecom/mwtm/sample/*.java
```

For the Windows platform, run the command like this:

```
%JAVA_HOME%\bin\javac -sourcepath %APP_SRC% -d %APP_CLASSES% -Xlint:deprecation
%APP_SRC%\com\cisco\mwtm\nbapi\*.java %APP_SRC%\com\samplecom\mwtm\sample\*.java
```

**Step 3** Run the application.

For the Solaris/Linux platform, enter:

```
$JAVA_HOME/bin/java -cp $APP_CLASSES com.samplecom.mwtm.sample.GetFilteredEvents
$MWTM_SERVER eventFilter.xml eventTrapTarget.xml
```

For Windows platform, enter:

```
%JAVA_HOME%\bin\java -cp %APP_CLASSES% com.samplecom.mwtm.sample.GetFilteredEvents
%MWTM_SERVER% eventFilter.xml eventTrapTarget.xml
```

The result is similar to the following:

```
Sending getFilteredEventsAsTraps to the server ...
getFilteredEventsAsTraps calling successful: 2090 events have been sent out as traps
Check trap receiver described by eventTrapTarget.xml
```



## MWTM 6.1 MIB Capabilities

The MIBCapability enumeration class lists the MIB capabilities defined for MWTM 6.1. These capabilities are described in the following tables:

- [CISCO-ASN-GATEWAY-MIB Capabilities](#)
- [CSG MIB Capabilities](#)
- [Device Type MIB Capabilities](#)
- [Generic MIB Capabilities](#)
- [GGSN MIB Capabilities](#)
- [Home Agent MIB Capabilities](#)
- [ITP MIB Capabilities](#)
- [NetNumber-Server MIB Capabilities](#)
- [RAN MIB Capabilities](#)
- [Titan MIB Capabilities](#)

**Table J-1** *CISCO-ASN-GATEWAY-MIB Capabilities*

Capability	Description
BWG	This is a BWG device.

**Table J-2** *CSG MIB Capabilities*

Capability	Description
CSG	This is a CSG1 device (has a CISCO-CSG-MIB). <b>Note</b> This capability checks if csgUserTable is not empty.
CSG2	This is a CSG2 device (has a CISCO-CONTENT-SERVICES-MIB).
CSG2_R2	This is a CSG2 device, and the release is R2 (has a CISCO-CONTENT-SERVICES-MIB). <b>Note</b> This capability tests for ccsLoadStatRadiusStartAllowed.

**Table J-3 Device Type MIB Capabilities**

Capability	Description
CISCO	This is a Cisco device.
ONS	This is an ONS device.
MWR	This is an MWR device.
SKYLA	This is a SKYLA card.
C2600	This is a 2600 device.
C3800	This is a 3800 device.
C7200	This is a 7200 device.
C7500	This is a 7500 device.
C7600	This is a 7600 device.
MWAM	This is a MWAM card.
SAMI	This is a SAMI card.
Linux	This is a Linux device.

**Table J-4 Generic MIB Capabilities**

Capability	Description
CISCO_ENHANCED_MEMORY_POOL	Device has a CISCO-ENHANCED-MEMORY-POOL-MIB. <b>Note</b> This capability is set only if compMemPoolTable is not empty.
CISCO_MEMORY_POOL	Device has a CISCO-MEMORY-POOL-MIB.
CISCO_PROCESS_MIB	Device has a CISCO-PROCESS-MIB.
CISCO_ICSDSU_MIB	Device has a TDM real time stats MIB.
CISCO_IETF_PW_MIB	Device has a CISCO-IETF-PW-MIB.
CISCO_IETF_PW_MIB_TABLE_NOT_EMPTY	Device has a CISCO-IETF-PW-MIB. <b>Note</b> This capability is set only if cpwVcTable and cpwVcPerfTotalTable are not empty.
CISCO_IP_LOCAL_POOL_MIB	Device has a CISCO-IP-LOCAL-POOL-MIB.
CISCO_ENVMON_TEMPERATURE_MIB	Device has a CISCO_ENVMON_TEMPERATURE_MIB for temperature-specific capability.
CISCO_ENVMON_VOLTAGE_MIB	Device has a CISCO_ENVMON_VOLTAGE_MIB for voltage specific capability.
CISCO_ENVMON_FAN_MIB	Device has a CISCO_ENVMON_FAN_MIB for fan specific capability.
CISCO_ENVMON_SUPPLY_MIB	Device has a CISCO_ENVMON_SUPPLY_MIB for power supply-specific capability.
CISCO_ENTITY_FRU_CONTROL_POWER_MIB	Device has a CISCO-ENTITY-FRU-CONTROL-MIB power status-specific capability.

**Table J-4 Generic MIB Capabilities (continued)**

Capability	Description
CISCO_ENTITY_FRU_CONTROL_MODULE_MIB	Device has a CISCO-ENTITY-FRU-CONTROL-MIB module status-specific capability.
CISCO_STACK_MIB	Device has a CISCO-STACK-MIB.
CISCO_AAA_SERVER_MIB	Device has a CISCO-AAA-SERVER-MIB.
IF_MIB	Device has an IF-MIB (ifXTable).
RFC1213	Device has an RFC-1213 MIB.
RFC1406	Device has an RFC-1406 MIB.

**Table J-5 GGSN MIB Capabilities**

Capability	Description
GGSN	This is a GGSN device.
GGSN8	Device is GGSN release 8 or greater.
SUPERVISES_SAMI	Device is a SUP card supervising one or more SAMI card(s).
PSD_CLIENT_MIB	Device has a CISCO-PSD-CLIENT-MIB.
GTP_MIB	Device has a CISCO-GTP-MIB.
GPRS_CHARGING_MIB	Device has a CISCO-GPRS-CHARGING-MIB.
GPRS_ACC_PT_MIB	Device has a CISCO-GPRS-ACC-PT-MIB.
GGSN_SERVICE_AWARE_MIB	Device has a CISCO-GGSN-SERVICE-AWARE-MIB.
GGSN_QOS_MIB	Device has a CISCO-GGSN-QOS-MIB.
GGSN_EXT_MIB	Device has a CISCO-GGSN-EXT-MIB.

**Table J-6 Home Agent MIB Capabilities**

Capability	Description
HA	Device is a Home Agent.  <b>Note</b> This capability is set only if RFC2006-MIB shows device is a Home Agent, and the CISCO-MOBILE-IP-MIB has implemented cmiHaMaximumBindings (HA 4.0 and above).
RFC2006_MIB	Device has an RFC2006-MIB (mobile IP).
CISCO_MOBILE_IP_MIB	Device has a CISCO-MOBILE-IP-MIB.
CISCO_MOBILE_IP_MIB_WITH_HA_MAX_BINDINGS	Device has a CISCO-MOBILE-IP-MIB with the cmiHaMaximumBindings variable.

**Table J-7 ITP MIB Capabilities**

Capability	Description
ITP	This is an ITP device.
ITP_SP	Device has a CISCO-ITP-SP-MIB.
ITP_GSP	Device has a CISCO-ITP-GSP-MIB.
ITP_GSP_T1E12	Device has a CISCO-ITP-GSP-MIB with cgspLinkQ752T1E12 object.
ITP_GSCCP_ADDR	Device has a CISCO-ITP-GSCCP-MIB with address table.
ITP_GSP_OFFLOAD	Device has a CISCO-ITP-GSP-MIB with offload feature.
ITP_GSCCP_X_INST	Device has a CISCO-ITP-GSCCP-MIB with cross instance translation.
ITP_MTP3_ERRORS	Device is ITP with MTP3 errors.
ITP_MONITOR	Device is ITP with monitor feature.
ITP_MLR	Device is ITP with MLR feature.
ITP_MLR_ADDR	Device is ITP with address table support.
ITP_MLR_V13	Device is ITP with v1.3 address table support.
ITP_GSP2_REDUN	Device is ITP with Redundancy support.
ITP_MONITOR_NOTIF	Device is ITP with monitor traps.
ITP_DSMR	Device is ITP with DSMR.
ITP_MSU_RATES	Device is ITP with MSU Rates MIB support.
ITP_VIRT_LS	Device is ITP with virtual linkset statistics support.
ITP_GSP2_PROCESSOR_NUMBER	Device is ITP with offload Processor Number to support sami.
ITP_GTT_V31	ITP with GTT File Format Version number 3.1.
ITP_GTT_V40	ITP with GTT File Format Version number 4.0.
ITP_GTT_V41	ITP with GTT File Format Version number 4.1.
ITP_GTT_V42	ITP with GTT File Format Version number 4.2.
ITP_GTT_V43	ITP with GTT File Format Version number 4.3.
ITP_GTT_V44	ITP with GTT File Format Version number 4.4.
TRAIN_MB	Device is an ITP MB train.
TRAIN_12_2_SW	Device is an ITP 12.2 sw train.
TRAIN_7600	Device is an ITP 7600 train.
TRAIN_12_4_SW	Device is an ITP 12.4 SW train.

**Table J-8 NetNumber-Server MIB Capabilities**

Capability	Description
CDT2	This is a CDT 2.0 device.

**Table J-9** *RAN MIB Capabilities*

<b>Capability</b>	<b>Description</b>
RANO	Device has a CISCO-IP-RAN-BACKHAUL-MIB.
RANO_BH_SH	Device has a CISCO-IP-RAN-BACKHAUL-MIB with Backhaul Shorthaul table.
RANO_BULK	Device has a CISCO-IP-RAN-BACKHAUL-MIB with Bulk table for SH stats.
RANO_OPTIMIZED_FLAG	Device has a CISCO-IP-RAN-BACKHAUL-MIB with Optimized Flag.

**Table J-10** *Titan MIB Capabilities*

<b>Capability</b>	<b>Description</b>
CDT3	This is a CDT 3.0 device.





## GLOSSARY

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### A

**Access Control List** See [ACL](#).

**ACL** Access Control List. It controls messages sent over SS7 networks using ITP

**Adjacent Point Code** See [APC](#).

**ANSI** American National Standards Institute. The principle standards development body in the USA. ANSI is a nonprofit, non-governmental body supported by over 1,000 trade organizations, professional societies, and companies. It is the USA's member body to ISO.

**APC** Adjacent Point Code. Point code of the adjacent ITP signaling point for the linkset. Contrast with *Local Point Code*.

**API** Application Programming Interface. A set of calling conventions which define how a service is invoked through a software package. The calls, subroutines, interrupts, and returns that comprise a documented interface so that a higher-level program such as an application can make use of the services of another application, operating system, network operating system, driver, or other lower-level software program.

**Application Programming Interface** See [API](#).

**AS** Application Server. Logical entity serving a specific routing key. The application server implements a set of one or more unique application server processes, of which one or more is normally actively processing traffic. An application server is a server computer in a computer network dedicated to running certain software applications. The term also refers to the software installed on such a computer to facilitate the serving (running) of other applications.

**ASP** Application Server Process. IP-based instance of an application server, such as Call Agents, HLRs, SMSCs, and so on. An application server process can implement more than one application server.

**ASPA** Application Server Process Association. ITP's virtual view of an application server process. The application server process association is defined on, and resides on, the ITP.

**Application Server** See [AS](#).

**Application Server Process** See [ASP](#).

**Application Server Process Association** See [ASPA](#).

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**B**

**Base Station Controller** See [BSC](#).

**Base Station System** See [BSS](#).

**Base Transceiver Station** See [BTS](#).

**browser** GUI-based hypertext client application, such as Internet Explorer, Netscape Navigator, or Firefox, enables a user to display and interact with text, images, and other information typically located on a web page at a website on the World Wide Web (WWW) or a local area network. Text and images on a web page can contain hyperlinks to other web pages at the same or different websites. Web browsers allow a user to quickly and easily access information provided on many web pages at many websites by traversing these links.

**BSC** Base Station Controller. Equipment that manages the radio resources in a GSM network (for example, BTSs).

**BSS** Base Station Subsystem. A subsystem in a GSM network that refers to the combined functions of the BTS and BSC.

**BTS** Base Transceiver Station. The equipment in a GSM network that is used to transmit radio frequencies over the air waves.

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**C**

**Capability Point Code** Point code shared by more than one signaling point, each of which is also assigned a “real” point code.

**CIC** Circuit Identification Code. Information identifying a circuit between a pair of exchanges, for which signaling is being performed.

**Circuit Identification Code** See [CIC](#).

**Cisco IOS and NX-OS software** Cisco Internetwork Operating System software. Cisco system software that provides common functionality, scalability, and security for many Cisco products. The Cisco IOS and NX-OS software allows centralized, integrated, and automated installation and management of internetworks, while ensuring support for a wide variety of protocols, media, services, and platforms.

**CLI** Command line interface. An interface that allows the user to interact with the Cisco IOS and NX-OS software operating system by entering commands and optional arguments.

**client** Node or software program that requests services from a server. The MWTM 6.1 user interface is an example of a client. See also [server](#).

<b>CLLI</b>	Common Language Location Identifier Code. Used within the Telecommunications industry to identify a specific physical location and piece of telco switching equipment. This is always an 11 character alphanumeric code that uniquely identifies the geographic location of the node, maintained by Telcordia.
<b>command line interface</b>	See <a href="#">CLI</a> .
<b>community string</b>	Text string that acts as a password and is used to authenticate messages sent between a management station and an ITP containing an SNMP agent. The community string is sent in every packet between the manager and the agent.
<b>congestion</b>	Condition in which a link has too many packets waiting to be sent. This condition could be caused by the failure of an element in the network. Possible levels are None, Low, High, and Very High, which correspond roughly to equivalent ANSI, China standard, ITU, NTT, and TTC congestion levels.
<b>Congestion window</b>	See <a href="#">CWND</a> .
<b>CWND</b>	Congestion window.
<hr/>	
<b>D</b>	
<b>Destination Point Code</b>	See <a href="#">DPC</a> .
<b>device</b>	See <a href="#">node</a> .
<b>device type</b>	In MWTM 6.1, the type of a discovered device, either a Cisco device or BTS or BSC device.
<b>discovered</b>	Object that has been discovered by MWTM 6.1. Also called <i>known</i> . Contrast with <i>unknown</i> .
<b>discovery</b>	Process by which MWTM 6.1 discovers in your network.
<b>display name</b>	User-specified name for a node.
<b>DNS</b>	Domain Name System. System used on the Internet for translating names of network nodes into addresses.
<b>DNS name</b>	Initial name of a node, as discovered by MWTM 6.1. <i>See also</i> <a href="#">node name</a> .
<b>domain name</b>	The style of identifier—a sequence of case-insensitive ASCII labels separated by dots (“bbn.com.”)—defined for subtrees in the internet Domain Name System [R1034] and used in other internet identifiers, such as hostnames, mailbox names, and URLs.
<b>Domain Name System</b>	See <a href="#">DNS</a> .
<b>DPC</b>	Destination Point Code. In ITP route tables, point code of the adjacent signaling point, the destination for packets on the selected signaling point.

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**E**

**Extensible Markup Language** See [XML](#).

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**F**

**FQDN** Fully Qualified Domain Name. Identifies a network element in the MWTM inventory tree. It is the full tree path from the root.

**Fully Qualified Domain Name** See [FQDN](#).

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**G**

**GSM** Global System for Mobile Communication. The most widely used digital mobile phone system and the de facto wireless telephone standard in Europe. Originally defined as a pan-European open standard for a digital cellular telephone network to support voice, data, text messaging and cross-border roaming. GSM is now one of the world's main 2G digital wireless standards.

**Global System for Mobile Communication** See [GSM](#).

**Global Title Translation** See [GTT](#).

**GTT** Global Title Translation. A global title is an application address, such as an 800 number, calling card number, or mobile subscriber identification number. Global Title Translation (GTT) is the process by which the SCCP translates a global title into the point code and subsystem number of the destination SSP where the higher-layer protocol processing occurs.

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**H**

**High Speed Link** See [HSL](#).

**host** Computer system on a network. Similar to the term node except that host usually implies a computer system, whereas node generally applies to any network system, including access servers and ITPs.

**hostname** The name of the operating system's server or computer which contains the major program files.

**HSL** High Speed Link. Link that can transmit at speeds of 1.544 Mbps on B and C signaling links over a T1 interface and at 2.048 Mbps over an E1 interface.

**HSMTMP2** High Speed MTP2. See also [MTP2](#).

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<b>HTML</b>	Hypertext Markup Language. Simple hypertext document formatting language that uses tags to indicate how a given part of a document should be interpreted by a viewing application, such as a web browser.
<b>HTTPS</b>	Hypertext Transfer Protocol over Secure Socket Layer, or HTTP over SSL. This is a web protocol developed by Netscape and built into its browser that encrypts and decrypts user page requests as well as the pages that are returned by the web server. HTTPS is really just the use of Netscape's Secure Socket Layer (SSL) as a sublayer under its regular HTTP application layering. (HTTPS uses port 443 instead of HTTP port 80 in its interactions with the lower layer, TCP/IP.) SSL uses a 40-bit key size for the RC4 stream encryption algorithm, which is considered an adequate degree of encryption for commercial exchange.
<b>hypertext</b>	Electronically-stored text that allows direct access to other texts by way of encoded links. Hypertext documents can be created using HTML, and often integrate images, sound, and other media that are commonly viewed using a browser.
<b>Hypertext Markup Language</b>	See <a href="#">HTML</a> .
<b>Hypertext Transfer Protocol over Secure Socket Layer</b>	See <a href="#">HTTPS</a> .
<hr/>	
<b>ignore</b>	Exclude an object when aggregating and displaying MWTM status information.
<b>International Telecommunication Union</b>	See <a href="#">ITU</a> .
<b>internet protocol</b>	See <a href="#">IP</a> .
<b>IP</b>	Internet Protocol. Network layer protocol in the TCP/IP stack offering a connectionless internetwork service. IP provides features for addressing, type-of-service specification, fragmentation and reassembly, and security. Documented in RFC 791.
<b>IP Address</b>	32-bit address assigned to hosts using TCP/IP. An IP address belongs to one of five classes (A, B, C, D, or E) and is written as 4 octets separated by periods (dotted decimal format). Each address consists of a network number, an optional subnetwork number, and a host number. The network and subnetwork numbers together are used for routing, while the host number is used to address an individual host within the network or subnetwork. A subnet mask is used to extract network and subnetwork information from the IP address.

**ITP** IP Transfer Point. Part of Cisco's hardware and software SS7-over-IP (SS7oIP) solution. ITP provides a reliable, cost-effective medium for migrating Signaling System 7 (SS7), the telecommunications network signaling technology, to the mobile wireless industry IP environment. ITP off-loads SS7 Short Messaging Service (SMS) traffic onto the IP network, replacing the mobile service provider's signaling network with a redundant IP cloud.

**ITU** International Telecommunication Union. Formerly the CCITT (Consultative Committee for International Telephony and Telegraphy), it is an international organization founded in 1865, now part of the United Nations System, that sets communications standards for global telecom networks. The ITU is comprised of more than 185 member countries. The Union began the 21st century streamlined into three sectors: Telecommunication Standardization (ITU-T), Radiocommunication (ITU-R) and Telecommunication Development (ITU-D).

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## K

**known** Device type for which the MWTM has determined the device type.

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## L

**link** In ITP, the connection between nodes.

**linkset** In ITP, a grouped set of links. In the MWTM, a representation of two linksets associated with two nodes, one for each side of a logical connection.

**linktype** In the MWTM, the type of a discovered link, either SCTP IP or serial.

**local IP address** IP address used by the MWTM client to connect to the MWTM server.

**Local Point Code** Point code of the primary signaling point for a linkset.

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## M

**M3UA** MTP3 User Adaptation Layer. Generally deployed in an application server, running as an Application Server Process (ASP), M3UA, combined with SS7 SCCP-User Adaptation Layer (SUA), provides access to SS7 through a signaling gateway.

**managed object** Application server, application server process, application server process association, link, linkset, node, Signaling Gateway Mate Protocol, or signaling point that is being managed by the MWTM.

**mask** Bit combination used in the MWTM to indicate the significant bits of the point code.

For ANSI and China standard networks using the default 24-bit point code format, the default mask is 255.255.255.

For ITU networks using the default 14-bit point code format, the default mask is 7.255.7.

For NTT and TTC networks using the default 16-bit point code format, the default mask is 31.15.127.

<b>Message Transfer Part2</b>	See <a href="#">MTP2</a> .
<b>Message Transfer Part3</b>	See <a href="#">MTP3</a> .
<b>MIB</b>	Management Information Base. A directory listing information that is used and maintained by a network's management protocol, such as SNMP.
<b>MTP2</b>	Message Transfer Part Level 2. Resides at Layer 2 in the SS7 protocol stack, it is responsible for the reliable transmission of signaling units over an individual Signaling Link. MTP2 reliability is achieved through retransmission techniques.
<b>MTP3</b>	Message Transfer Part Level 3. It provides message routing between signaling points in the SS7 network. It re-routes traffic away from failed links and signaling points and controls traffic when congestion occurs.

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## N

<b>NBAPI</b>	Northbound Application Programming Interface.
<b>NE</b>	Network Element. This is a device that resides inside a managed network. Typically, a network element provides some services to a network operator, such as ATM or Frame Relay virtual circuits, MPLS, and IP. NEs host MIBs and the objects in these MIBs can be used by network management systems.
<b>Network Element</b>	See <a href="#">NE</a> .
<b>Nippon Telegraph and Telephone Corporation</b>	See <a href="#">NTT</a> .
<b>NMS</b>	Network Management System. Network Management System is a term that describes a computer-based software application suite dedicated to the management of networks of NEs. Typically, the NMS provides abstractions (such as signaling links and virtual connections) appropriate to the overall running of a network; that is, it is not exclusively concerned with the details of one NE. Communication between an NMS and NEs is typically executed via an EMS, where the latter might reside on the NE. Above the NMS, the OSS is found.
<b>node</b>	Endpoint of a network connection or a junction common to two or more lines in a network. Nodes can be processors, controllers, or workstations. Nodes, which vary in routing and other functional capabilities, can be interconnected by links, and serve as control points in the network.  In RAN networks, a node is a Cisco Mobile Wireless Router (MWR 1941-DC-A).
<b>node name</b>	Name of a node. This is either the DNS name of the node, or a user-specified name. See also <a href="#">DNS name</a> .
<b>NTT</b>	Nippon Telegraph and Telephone Corporation. It is made up of two local carriers and a long-distance provider. The world's #1 telecommunications firm, NTT is a holding company for regional local phone companies NTT East and NTT West, which enjoy de facto monopolies in their markets, and long-distance carrier NTT Communications. NTT also operates a leading ISP and it owns 62% of Japan's dominant cellular carrier, NTT DoCoMo.

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**O**

- object** Application server, application server process, application server process association, link, linkset, node, Signaling Gateway Mate Protocol, or signaling point that has been discovered by the MWTM.
- OSS** Operations Support System. Methods and procedures that support the daily operation of a carrier's infrastructure, including order processing, equipment assignment, and so on.
- ONS** Optical Networking System. Cisco proprietary optical networking product.
- Optical Networking System** See [ONS](#).
- Operations Support System** See [OSS](#).

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**P**

- PCR** Preventive Cyclic Redundancy. It is the error detection method used when SS7 is transmitted over satellite links. When using PCR, all of the transmitted signaling units are continually retransmitted until they are acknowledged by the distant end. Once acknowledged, the signaling units are dropped from the transmission buffer.
- Permanent Virtual Circuit** See [PVC](#).
- pointcode** A unique address code that identifies a service provider within a signaling network. Also called primary point code. See [Capability Point Code](#), [Destination Point Code](#), and [Local Point Code](#).
- polling** Access method in which a primary network device inquires, in an orderly fashion, whether secondaries have data to transmit. The inquiry occurs in the form of a message to each secondary that gives the secondary the right to transmit.
- port** In IP terminology, an upper-layer process that receives information from lower layers. Ports are numbered, and each numbered port is associated with a specific process. For example, SMTP is associated with port 25. A port number is also called a well-known address.
- Preventive Cyclic Redundancy** See [PCR](#).
- process** Internal component of the MWTM.
- PVC** Permanent Virtual Circuit. Virtual circuit that is permanently established. PVCs save bandwidth associated with circuit establishment and tear down in situations where certain virtual circuits must exist all the time.

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**Q**

- QoS** Quality of service. Measure of performance for a transmission system that reflects its transmission quality and service availability.

- Quality of service** See [QoS](#).
- QSAAL** The Q.2931 signaling ATM adaptation layer.

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## R

- Radio Network Controller** See [RNC](#).
- RAN** Radio Access Network-Optimization. The Cisco RAN Optimization solution optimizes GSM and UMTS traffic at the cell site and enables end-to-end IP services, reducing OpEx, increasing RAN efficiency, and delivering new revenue-generating services.
- Cisco MWR 1900 Series mobile wireless routers compress and optimize GSM and UMTS traffic, reducing leased line costs, and using the recaptured backhaul bandwidth to transport IP data services. The routers support traditional narrowband (T1/E1, microwave) and high-speed (xDSL, WiMax, Metro Ethernet) RAN backhaul networks, for scalability and cost reduction.
- The Cisco MWR also provides aggregation and optimization services for backhaul traffic at the core site. It connects multiple cell-site mobile wireless routers to a base station controller/radio network controller (BSC/RNC).
- RANSVC (RAN-SM)** Cisco RAN Service Module. The RAN Service Module supports the Cisco IOS® Software operating system with RAN-specific feature sets to enable optimization of mixed generation cell-site backhaul links. The RAN-SM supports 2G, 2.5G, and 3G voice and data traffic, optimizing the traffic to only transmit essential data and reducing the total traffic load on the backhaul network. The solution is completely RAN-vendor-agnostic, making it compatible even with proprietary Abis interface specifications.
- The Global System for Mobile Communication (GSM) RAN optimization feature optimizes GSM Abis interface traffic between the base transceiver station (BTS) and base station controller (BSC). The feature removes nonessential traffic, such as idle and silence frames, which can result in optimization gains of up to 50 percent, depending on traffic profiles. Optimized traffic frames are converted to IP packets and transmitted to the remote IP peer where any removed frames are reinserted and then forwarded to the base station subsystem (BSS) node.
- The Universal Mobile Telecommunications Service (UMTS) RAN optimization feature optimizes the Iub interface between the Node B and radio network controller (RNC) elements. It supports ATM-based traffic and performs cell optimization and conversion to IP packets. The conversion to IP allows the software to route each permanent virtual circuit (PVC) through a defined IP path, allowing different PVCs to use the most efficient backhaul technologies available at the cell site.
- The RAN Service Module is Installed in the Cisco ONS 15454 SONET/SDH Multiservice Provisioning Platform.
- RAN Service Module** See [RANSVC \(RAN-SM\)](#).
- RDN** Relative Distinguished Name. An RDN uniquely identifies a child inventory object under a given network element (NE).
- Remote Procedure Call** See [RPC](#).

**RNC** Radio Network Controller. It is the element in the UMTS radio network (UTRAN) responsible for control of the Node-Bs in the radio network, that is to say the base stations which are distributed throughout the country. The RNC carries out some of the mobility management functions and is the point where encryption is done before user data is sent to and from the mobile. The RNC connects to the Circuit Switched Core Network through Media Gateway (MGW) and to the SGSN (Serving GPRS Support Node) in the Packet Switched Core Network.

**RPC** Remote Procedure Call. This is a protocol that allows a computer program running on one host to cause code to be executed on another host without the programmer needing to explicitly code for this. When the code in question is written using object-oriented principles, RPC is sometimes referred to as remote invocation or remote method invocation.

---

## S

**SCCP** Signaling Connection Control Part. A component of the SS7 protocol suite that provides additional functions to those of the message transfer part (MTP). SCCP provides both connectionless and connection-oriented network services to transfer signaling information across telecommunication networks, such as GSM.

**SCCP User Adaptation** See [SUA](#).

**SCP** Service Control Point. An element of an SS7-based Intelligent Network which performs various service functions, such as number translation, call setup and teardowns, and so on.

**SCTP** Stream Control Transmission Protocol. An end-to-end, connection-oriented protocol that transports data in independent sequenced streams.

**serial** Method of data transmission in which the bits of a data character are transmitted sequentially over a single channel.

**server** Node or software program that provides services to clients. See also [client](#).

**Service Control Point** See [SCP](#).

**Service Switching Point** See [SSP](#).

**SGM** Signaling Gateway Manager. Cisco proprietary product that provides monitoring and management capabilities for Cisco IP Transfer Point (ITP) networks

**SGMP** Pair of signaling gateways that exchange necessary state information using the Signaling Gateway Mate Protocol (SGMP). See [Application Server](#), [Application Server Process](#), and [Application Server Process Association](#).

**Signaling Connection Control Part** See [SCCP](#).

**Signaling Gateway Mate Protocol** See [SGMP](#).

<b>signaling point</b>	See <a href="#">SP</a> .
<b>Signaling Transfer Point</b>	See <a href="#">STP</a> .
<b>SMTP</b>	Simple Mail Transfer Protocol. The de facto standard for e-mail transmissions across the Internet.
<b>SNMP</b>	Simple Network Management Protocol. The network management protocol used almost exclusively in TCP/IP networks. SNMP provides a means to monitor and control network devices, and to manage configurations, statistics collection, performance, and security.
<b>SOAP</b>	Simple Object Access Protocol. A communication protocol between remote applications (see <a href="http://www.w3.org/TR/soap/">http://www.w3.org/TR/soap/</a> ).
<b>SP</b>	Signaling point. An SCP, SSP, or STP, or an ITP instance.
<b>SSP</b>	Service Switching Point. An SS7 signaling node which interacts with the service control point (SCP) to implement special service code features.
<b>SQL</b>	Structured Query Language. A standard interactive and programming language for getting information from and updating a database. Although SQL is both an ANSI and an ISO standard, many database products support SQL with proprietary extensions to the standard language. Queries take the form of a command language that lets you select, insert, update, find out the location of data, and so forth.
<b>Structured Query Language</b>	See <a href="#">SQL</a> .
<b>status</b>	Current condition, such as known or unknown, of a network object.
<b>Stream Control Transmission Protocol</b>	See <a href="#">SCTP</a> .
<b>status polling</b>	Regularly scheduled polling of nodes performed by the MWTM.
<b>STP</b>	Signaling Transfer Point. A node in an SS7 network that routes messages between nodes. STPs transfer messages between incoming and outgoing signaling links, but with the exception of network management information, do not originate or terminate messages. STPs are deployed in pairs. If one STP fails, the mates takes over, ensuring that service continues without interruption.
<b>SUA</b>	SCCP User Adaptation. SUA describes a transport mechanism for delivering SS7 SCCP-User Part messages as well as certain SCCP network management events over SCTP transport to IP-based application processors or databases. The SUA SG terminates the SS7 MTP2, MTP3, and SCCP protocol layers and delivers TCAP, RANAP and/or any other SCCP-User protocol messages. The Application Server Process (ASP) is the IP-based instance of an application process or database (e.g. HLRs, SMSCs, etc.)

---

**T**

<b>TCP</b>	Transmission Control Protocol. Connection-oriented transport layer protocol that provides reliable full-duplex data transmission. TCP is part of the TCP/IP protocol stack.
------------	---

**Telecommunication Technology Committee** See [TTC](#).

**timeout** Event that occurs when one network device expects to hear from another network device within a specified period of time, but does not. The resulting timeout usually results in a retransmission of information or the dissolving of the session between the two devices.

**trap** Unsolicited message sent by an SNMP agent to an NMS, console, or terminal to indicate the occurrence of a significant event, such as a specifically defined condition or a threshold that has been reached.

**trap forwarding** Forwarding MWTM events to other hosts, in the form of SNMP traps. This enables the MWTM to integrate with high-level event- and alarm-monitoring systems, such as the Cisco Info Center (CIC) and Micromuse's Netcool suite of products. These systems can provide a single high-level view of all alarm monitoring in your network, making it easier to detect and resolve problems.

**TTC** Telecommunication Technology Committee. The Telecommunication Technology Committee (TTC) was established as a private standardization organization in October 1985.

The purpose of this committee is to contribute to standardization in the field of telecommunications by establishing protocols and standards for telecommunications networks and terminal equipment as well as to disseminate those standards.

---

## U

**UMTS** Universal Mobile Telecommunications Service. It is a third-generation (3G) broadband, packet-based transmission of text, digitized voice, video, and multimedia at data rates up to 2 megabits per second (Mbps). UMTS offers a consistent set of services to mobile computer and phone users, no matter where they reside in the world. UMTS is based on the GSM communication standard. It is also endorsed by major standards bodies and manufacturers as the planned standard for mobile users around the world.

**unknown** Device type for which the MWTM is unable to determine the device type. If a node, the node failed to respond to an SNMP request. If a linkset or link, either the associated node failed to respond to an SNMP request, or the MWTM found that the linkset or link no longer exists. Contrast with *discovered*.

**utilization** Amount of an object's send or receive capacity that is being used, expressed as a percentage or in Erlangs.

---

## W

**Web Service Definition Language** See [WSDL](#).

**W3** World Wide Web Consortium. The World Wide Web Consortium develops interoperable technologies (specifications, guidelines, software, and tools) to lead the web to its full potential. W3C is a forum for information, commerce, communication, and collective understanding (see <http://www.w3.org/>).

**World Wide Web** See [WWW](#).

- WSDL** Web Service Definition Language. An interface definition language for web service (see <http://www.w3.org/TR/wsdl>).
- WWW** World Wide Web. Large network of Internet servers providing hypertext and other services to terminals running client applications such as a browser. See also [browser](#).

---

## X

- XML** Extensible Markup Language. An open standard for describing data content.
- XML Schema Definition** See [XSD](#).
- XSD** XML Schema Definition. A recommendation of the World Wide Web Consortium (W3C), specifies how to formally describe the elements in an Extensible Markup Language (XML) document. This description can be used to verify that each item of content in a document adheres to the description of the element in which the content is to be placed.
- In general, a schema is an abstract representation of an object's characteristics and relationship to other objects. An XML schema represents the interrelationship between the attributes and elements of an XML object (for example, a document or a portion of a document). To create a schema for a document, you analyze its structure, defining each structural element as you encounter it. For example, within a schema for a document describing a website, you would define a website element, a web page element, and other elements that describe possible content divisions within any page on that site. Just as in XML and HTML, elements are defined within a set of tags.
- XSD has several advantages over earlier XML schema languages, such as document type definition (DTD) or Simple Object XML (SOX). For example, it's more direct: XSD, in contrast to the earlier languages, is written in XML, which means that it doesn't require intermediary processing by a parser. Other benefits include self-documentation, automatic schema creation, and the ability to be queried through XML Transformations (XSLT).





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