CHAPTER 6

# Deploying a Site, Object, or Network

## Introduction to Deployment

This chapter describes how to deploy a site, object, or network. Deployment is the term used within CMNM to mean the addition of objects to the CEMF network model. CMNM provides two methods to deploy Cisco MGC nodes and subobjects:

- Manual deployment uses the standard CEMF deployment framework.
- Seed file deployment allows you to specify, on a bulk basis rather than on an individual basis, the components to be managed.

  Seed file configuration requires that you define the Cisco MGC network or object (or a portion of it) in an external file that is read by CMNM. Based on the contents of this file, CMNM deploys the file to Cisco MGC nodes and subnodes.

You can also manage software images and configurations on the Cisco MGC node devices. For more information, see the "Managing Software Images and Configurations" section on page 6-16.

### Meeting Password Requirements

IDs and passwords must be consistent across all of the devices being deployed, or deployment does not fully succeed. As a result, you must use an additional CEMF dialog to specify the correct login ID and password for the devices. In addition, you have to manually discover the logical connectivity network for those devices.

Anytime a password is changed on a device, you must make a corresponding change in CMNM. Otherwise CMNM's saved passwords will not match those on the devices; polling and connectivity network discovery fail. The same is true for SNMP community strings on the Cisco SLTs and LAN switch.

- When using manual deployment, the deployment wizard templates prompt for the appropriate IDs and passwords.
- When using seed-file deployment, you are prompted to enter the name of the seed-file, the login IDs, and passwords.

## Deploying a Network Using a Seed File

For bulk deployment, you can use a deployment seed file. This seed file contains all of the information necessary to deploy an entire Cisco MGC network.

This seed file contains the IP addresses of all of the devices in the Cisco MGC network, plus the relationship (hierarchy) between the devices. Given this file, CMNM is able to automatically deploy all the elements in the network.

The data in the seed file includes, but is not limited to the:

- Logical names of each Cisco MGC node in the network
- IP address of each Cisco MGC host for each Cisco MGC node
- IP address of each Cisco SLT for each Cisco MGC node
- IP address of each LAN switch for each Cisco MGC node
- The physical location of the device

A sample seed file is shown in Example 6-1.

***Example 6-1 Sample Seed File***

```
MGC (name=mgc1, location=Raleigh) {
    HOST (ip=191.34.44.2, login=transpath)# Hosts
    HOST (ip=191.34.44.3, password=lab)
    2600 (ip=191.34.44.4, name=joe, read=public, location=SanJose)
    2600 (ip=191.34.44.5, name=bob)
    2900XL (ip=191.34.44.6)# LAN Switch
    5500 (ip=181.33.44.7, write=private)
}
BAMS (ip=181.33.44.8, name=bambam, location=Chicago)
BAMS (ip=181.33.44.9, name=pebbles, location=St-Louis)
MGC (name=mgc2) {
    HOST (ip=191.44.55.78, read=public, write=private)
    2600 (ip=191.44.55.80)# SLTs
    2600 (ip=191.44.55.81, location=Boston)
    # Switches
    2900XL (ip=191.44.55.82, name=tex, location=Boston)
    5500 (ip=191.44.55.83)
}
```

# Seed File Attributes

The seed file allows you to specify a number of attributes for each device. In some cases these attributes are required. Optional attributes assume a default value if they are not specified. The default values are specified in the seed file deployment dialog.

The supported attributes are described in Table 6-1.

***Table 6-1 Seed File Attributes***

| Attribute | Device Types | Required | Description |
|---|---|---|---|
| name | All | Only on Cisco MGC node and BAMS | Name of the object as seen in the GUI |
| ip | All except Cisco MGC node | Yes | IP Address of the network element |
| login | All except Cisco MGC node | No | Login ID for the device |
| password | All except Cisco MGC node | No | Password to log in to the device |

*Table 6-1 Seed File Attributes*

| | | | |
|---|---|---|---|
| rootPassword | Cisco MGC host, BAMS | No | Root (super-user) password for the device |
| enablePassword | Cisco 2611, 2900XL, 5500 | No | IOS and Catalyst enable password |
| read | All except Cisco MGC node | No | SNMP read-community string |
| write | All except Cisco MGC node | No | SNMP write-community string |
| location | All | No | Physical location of the device |

Each Cisco MGC node can have, at most, one active host. You can define a maximum of two hosts per Cisco MGC node, one representing the active Cisco MGC host and the other the standby Cisco MGC host. You do not have to define which host is active or standby; this is determined automatically by CMNM.

You must specify the name for each Cisco MGC node. Optionally, you can then specify names for the other elements. If no name is specified, a default name is generated. In addition, you can specify account information about the various devices: login IDs, passwords, and SNMP community strings. Each value is optional and, if missing, is initialized by the corresponding value in the seed file deployment dialog.

To perform seed file deployment, you launch a dialog from a MGC-Node-View node or other type of CEMF object. This dialog prompts you for the name of the seed file and the login ID and password for the Cisco MGC host devices. You also specify SNMP read- and write-community passwords for the Cisco SLT and LAN switch.

## Physical Location Field

When a device is deployed, it is placed into the Physical containment tree based on the physical location of the devices. That is, all devices in Chicago are placed under a region or site object named Chicago. When generating the seed file, you use the location attribute to specify where in the Physical containment tree each device should be deployed.

If you do not specify a physical location (the location attribute is optional), the objects are deployed in the same location as its logical parent. Otherwise, the object is deployed in a site named Default. If you specify a physical location, the devices are deployed under that object accordingly. If the specified location does not exist, CMNM automatically deploys a region object with the specified location name.

Cisco MGC node objects are not physical devices and, as such, are not deployed into the Physical containment tree. However, the seed file lets you specify a location for Cisco MGC nodes. This is done so dependent children of the Cisco MGC node can, by default, be placed in the specified location. For example, assume that you specify that a Cisco MGC node is in the site Cincinnati. All of its children that do not specifically specify a location are, by default, placed in the Cincinnati site.

# Specifying a Deployment Seed File

To deploy a network using a seed file:

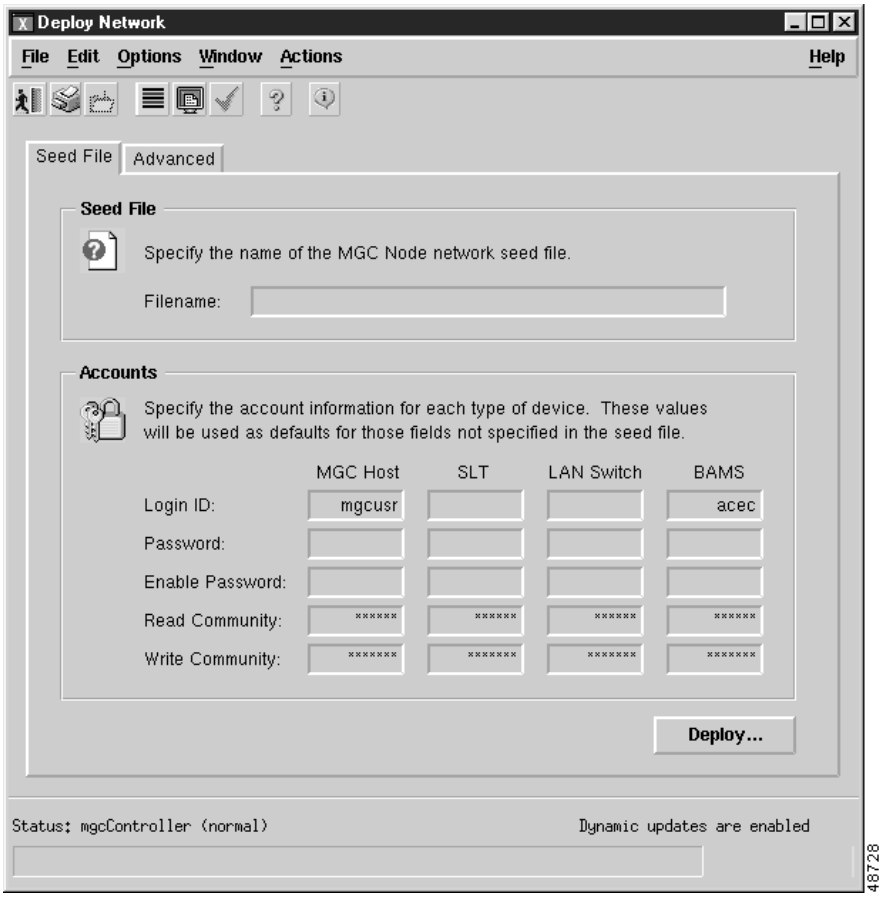
**Step 1** From the Map Viewer screen, select the MGC-Node-View icon.

**Step 2** Right-click to display the pull-down menu, select **Deployment**, then **Deploy Network Seed File**.

**Note** Only one Cisco MGC node can be deployed at a time. Each requires a seperate seed file.

You see the screen in Figure 6-1.

***Figure 6-1 Deploy Network Screen—Seed File Tab***



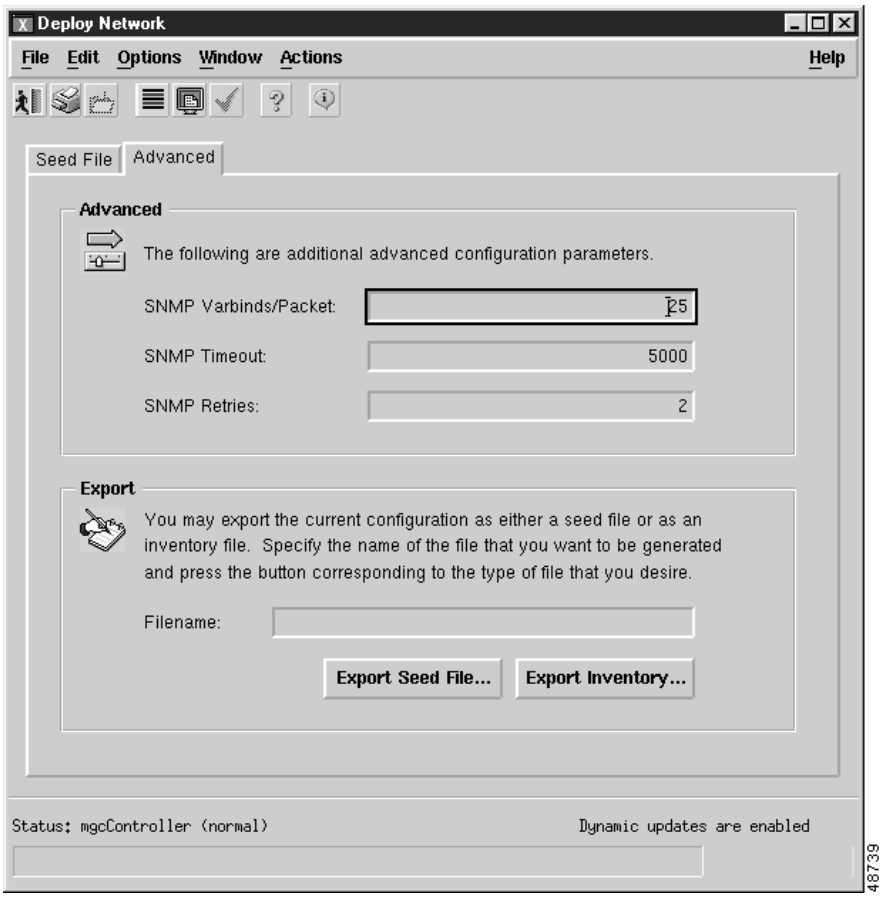

**Step 3** Enter a filename in the seed file Filename field.

**Step 4** If any fields for a type of device are not specified in the seed file, you can enter account information for each type of device on this screen.

**Step 5** To enter advanced information, click the **Advanced** tab.

You see the screen in Figure 6-2.

*Figure 6-2 Deploy Network Screen—Advanced Tab*




**Step 6** You can enter SNMP configuration parameters. You can also export the current configuration as a seed file or an inventory file.

An inventory file contains a description of all of the devices in the Cisco MGC network, including:

- IP address
- Hardware type
- Operating system and software versions

The inventory file lists all of the Cisco MGC node devices in the network. For each Cisco MGC node device, information about each sub-device in the node is listed. For example:

```
MGC (name=node1) {
HOST(name=host1,ip=1.2.3.4,os=Solaris 2.6,...)
2600(name=slt1,ip=3.4.5.6,os=IOS 12.3,image=boot3.1b,...)
5500(name=sw1,ip=2.3.4.5,os=CATOS 5.3,image=rboot3,...)
BAM(name=bam1,ip=5.6.4.3,os=Solaris 2.6,...)
}
MGC (name=node2) {
...
}
```

The attributes exported for the various device types are shown in Table 6-2.

*Table 6-2 Inventory Export Attributes*

| Attribute | Types | Description |
|---|---|---|
| name | All | Name of the object in the CEMF display |
| ip | All except Cisco MGC | IP address of the device |
| os | All except Cisco MGC | Operating system name and version |
| boot | Cisco SLT/LAN switch | Name of the OS boot image |
| hostID | Cisco MGC host/BAMS | Solaris host ID |
| hostName | Cisco MGC host/BAMS | Name of the host |

**Step 7** When you are finished, click the **Seed File** tab to return to the screen in Figure 6-1 and click **Deploy**.

You see the screen in Figure 6-3.

*Figure 6-3 Deploy Confirmation Prompt*


**Step 8** Click **Yes**.

The network is deployed.

# Manually Deploying a Site, Object, or Network

The deployment wizard is the graphical user interface (GUI) used to create new objects representing the network elements to be managed with CMNM. The deployment wizard uses deployment profiles to prompt you for the information that is required by the deployment process. It can be accessed from different windows within CMNM as outlined below.

**Note** Only one deployment wizard can be open at any time. If you attempt to open a second wizard, you see the message:

The Deployment Wizard is already active. Select it from the Window menu, or check for iconified or hidden windows.

Complete the first deployment task before proceeding.

CMNM defines a number of templates that allow you to manually configure Cisco MGC nodes and subobjects. The templates include:

- Template to deploy a top-level Cisco MGC node (This template also allows you to deploy a Cisco MGC host pair as a child of the Cisco MGC node.)

- Template to deploy a top-level gateway (Cisco MGX 8260)
- Template to deploy a top-level BAMS
- Template to deploy a Cisco MGC host pair as child of a Cisco MGC node
- Template to deploy a Cisco SLT as a child of a Cisco MGC node
- Template to deploy a LAN switch as a child of a Cisco MGC node

The deployment wizard reads the templates and presents screens prompting for information about the devices.

# Deployment Attributes

Table 6-3 describes deployment attributes.

***Table 6-3 Deployment Attributes Table***

| Attribute | Device Type | Required | Description |
|---|---|---|---|
| Name | All | Yes | Name of the object as seen in the GUI |
| IP | All except Cisco MGC node | Yes | IP address of the network element |
| Login | Cisco MGC host, Cisco SLT, LAN switch, BAMS | Yes for Cisco MGC host | Login ID for the device |
| Password | Cisco MGC host, Cisco SLT, LAN switch, BAMS | Yes | Password to login to the device |
| Root password | Cisco MGC host | Yes | Root (super-user) password for the host |
| Enable password | Cisco SLT, LAN switch, BAMS | Yes | IOS/Catalyst enable password |
| Read Community | All except Cisco MGC node | Yes | SNMP read-community string |
| Write community | All except Cisco MGC node | Yes | SNMP write-community string |

# Opening the Deployment Wizard

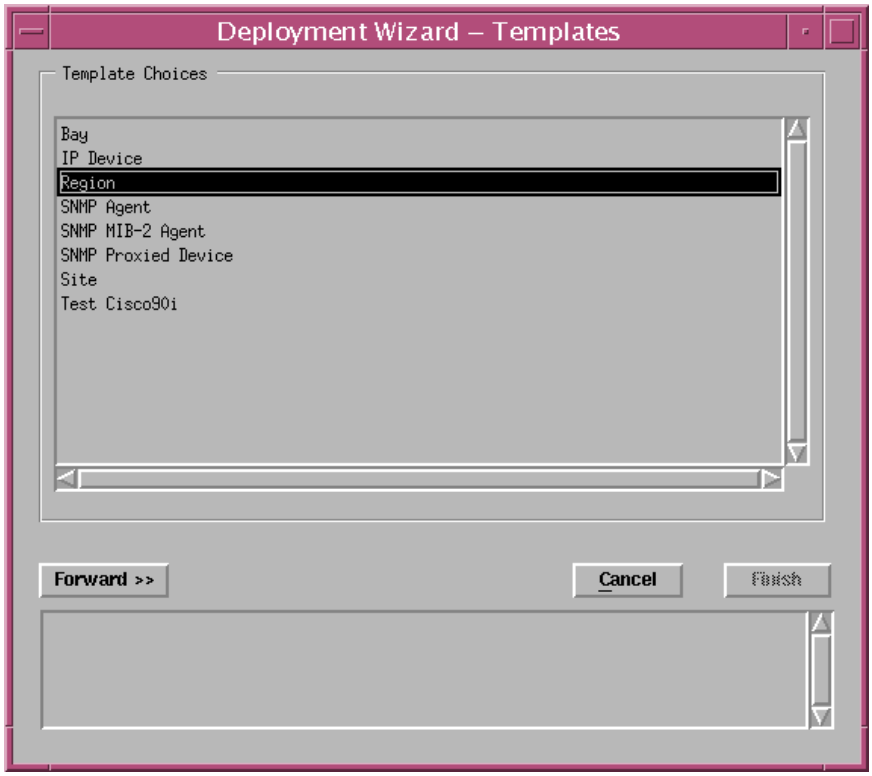
To open the deployment wizard:

**Step 1** Right-click the object below which you want to deploy.

**Step 2** From the pop-up menu, select **Deployment**, then select **Deploy Generic Objects**.

You see the screen in Figure 6-4.

*Figure 6-4 Deployment Wizard Screen—Templates*




# Deploying a Cisco MGC Node

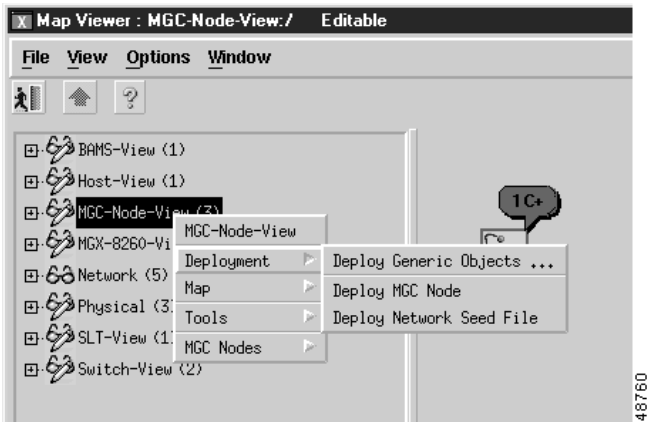
To deploy a Cisco MGC node:

**Step 1** Open the Map Viewer window.

**Step 2** Click to select a MGC-Node-View icon from the left panel of the Map Viewer window.

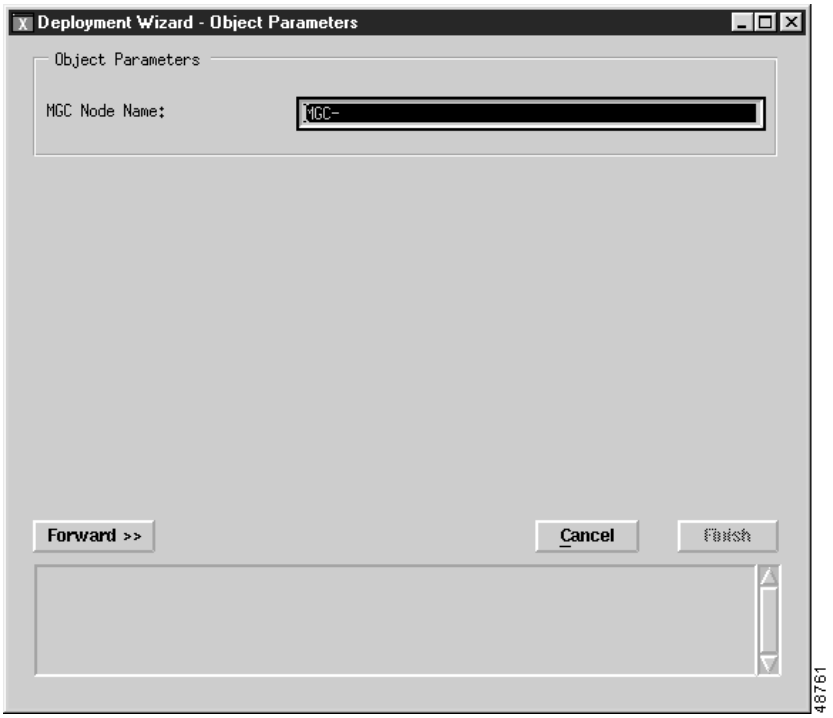
**Step 3** Right-click the **MGC-Node-View** icon, select **Deployment**, then **Deploy MGC Node**, as shown in Figure 6-5.

*Figure 6-5 Map Viewer Screen—Deployment>Deploy MGC Node Option*




You see the screen in Figure 6-6.

*Figure 6-6 Deployment Wizard Screen—Object Parameters*




**Step 4** Enter the name of the Cisco MGC node (no spaces). Click **Forward**.

You see a screen that summarizes the deployment you have created and allows you to commit or reject the deployment.

**Step 5** Click **Finish**.

You are informed if deployment has been successful. A Cisco MGC icon appears on the right pane of the Map Viewer window.

**Step 6** Deploy Cisco MGC hosts by following the instructions in the “Deploying a Cisco MGC Host” section on page 6-10.

**Step 7** Deploy Cisco SLTs by following the instructions in the "Deploying a Cisco SLT" section on page 6-10.

**Step 8** Deploy LAN switches by following the instructions in the "Deploying a LAN Switch" section on page 6-11.

**Step 9** Deploy Cisco MGX 8260s by following the instructions in the "Deploying a Cisco MGX 8260" section on page 6-11.

**Step 10** Deploy the optional Billing and Measurements Server by following the instructions in the "Deploying a Billing and Measurements Server (BAMS)" section on page 6-11.

## Deploying a Cisco MGC Host

**Step 1** Open the Map Viewer window.

**Step 2** Expand the MGC-Node-View icon and click to select a Cisco MGC node icon from the left panel of the Map Viewer window.

**Step 3** Right-click the **MGC node** icon and select **Deployment**, then **Deploy MGC Node Component**.

**Step 4** Click **Deploy an MGC Host** and click **Forward**.

**Step 5** Enter data for the host. See Table 6-3 on page 6-7 for descriptions of the fields. Click **Forward**.

**Step 6** Select a relationship and click **Forward**.

**Step 7** Click **Finish**.

A Common-Host icon appears on the right pane of the Map Viewer window. Also, a host icon appears on the left panel as a child node of the common-host node.

## Deploying a Cisco SLT

**Step 1** Open the Map Viewer window.

**Step 2** Expand the MGC-Node-View icon and click to select a Cisco MGC node icon from the left panel of the Map Viewer window.

**Step 3** Right-click the **MGC node** icon and select **Deployment**, then **Deploy MGC Node Component**.

**Step 4** Click **Deploy an SLT** and click **Forward**.

**Step 5** Enter data for the Cisco SLT. See Table 6-3 on page 6-7 for descriptions of the fields. Click **Forward**.

**Step 6** Select a relationship and click **Forward**.

**Step 7** Click **Finish**.

A Cisco SLT icon appears on the right pane of the Map Viewer window.

# Deploying a LAN Switch

**Step 1** Open the Map Viewer window.

**Step 2** Expand the MGC-Node-View icon and click to select a Cisco MGC node icon from the left panel of the Map Viewer window.

**Step 3** Right-click the **MGC node** icon and select **Deployment**, then **Deploy MGC Node Component**.

**Step 4** Click **Deploy a 2900 XL Switch** or **Deploy a Catalyst 5500 Switch** and click **Forward**.

**Step 5** Enter data for the LAN switch. See Table 6-3 on page 6-7 for descriptions of the fields. Click **Forward**.

**Step 6** Select a relationship and click **Forward**.

**Step 7** Click **Finish**.

A LAN switch icon appears on the right pane of the Map Viewer window.

# Deploying a Cisco MGX 8260

**Step 1** Open the Map Viewer window.

**Step 2** Click to select a MGC-8260-View icon from the left panel of the Map Viewer window.

**Step 3** Right-click the **MGC-8260-View** icon and select **Deployment**, then **Deploy MGX 8260**.

**Step 4** Enter data for the media gateway. See Table 6-3 on page 6-7 for descriptions of the fields. Click **Forward**.

**Step 5** Select a relationship and click **Forward**.

**Step 6** Click **Finish**.

A media gateway icon appears on the right pane of the Map Viewer window.

# Deploying a Billing and Measurements Server (BAMS)

**Step 1** Open the Map Viewer window.

**Step 2** Click to select a BAMS-View icon from the left panel of the Map Viewer window.

**Step 3** Right-click the **BAMS-View** icon and select **Deployment**, then **Deploy BAMS**.

**Step 4** Enter data for the BAMS server. See Table 6-3 on page 6-7 for descriptions of the fields. Click **Forward**.

**Step 5** Select a relationship and click **Forward**.

**Step 6** Click **Finish**.

An icon appears on the right pane of the Map Viewer window.

# Subrack Discovery

When a Cisco SLT, LAN switch, Cisco MGC host, or BAMS is deployed, its subrack components are queried and deployed. The types of subrack components, as well as their relationships, differ based on the type of device.

CMNM performs the subrack discovery of various types of devices. When a device is deployed, CMNM checks the OID of the device. If possible, CMNM performs custom subrack discovery based on the device type. Otherwise, a generic discovery mechanism is used.

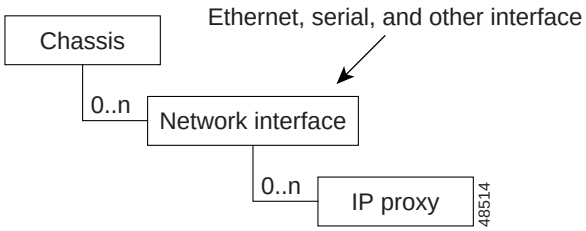
The various subrack discovery mechanisms are described in the following sections.

**Note** CMNM automatically discovers each device at an interval you may specify and keeps track of the time that each device was last discovered. When the specified interval has elapsed, CMNM automatically rediscovers the device.

## Cisco MGC Host and BAMS Discovery

The Cisco MGC host and BAMS discovery mechanism processes the ifTable of the device and deploys an object to represent each (supported) interface. BAMS also uses the CIAgent system component discovery mechanism. In addition, an object representing each (non-loopback) IP address is deployed as a child of its corresponding interface as shown in Figure 6-7.

***Figure 6-7 Cisco MGC Host and BAMS Discovery***




This subrack discovery mechanism is used for the Cisco MGC host, BAMS, and any unknown or unsupported device that is deployed.

### CIAgent System Component Discovery

For devices that support the CIAgent SNMP Agent (Cisco MGC host and BAMS), components are deployed that represent logical components of the UNIX system, as shown in Table 6-4

***Table 6-4 Components Deployed***

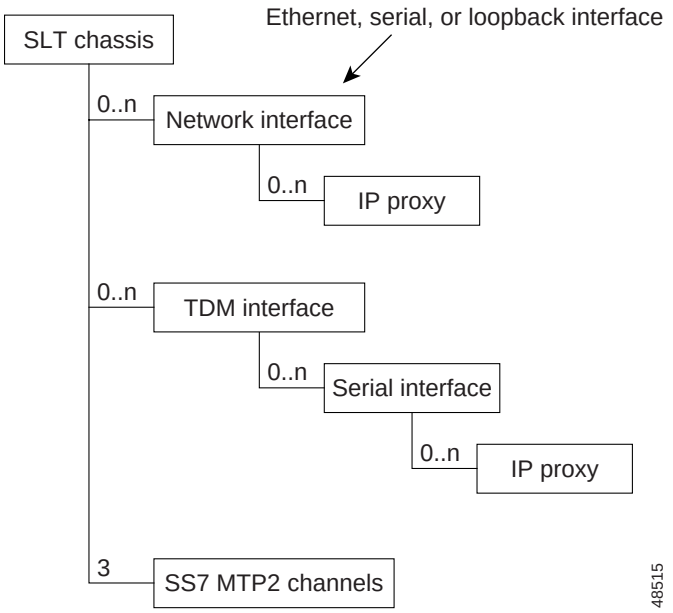
| Component Type | Description |
|---|---|
| RAM | Physical RAM in the UNIX machine |
| virtualmem | Virtual memory storage |
| Fixed disk | Local (non-ncs mounted) disk drive |
| Processor | Processor (CPU) |

# Cisco SLT Discovery

The Cisco 2611 series auto-discovery mechanism expands slightly on the Cisco MGC host and BAMS discovery mechanism. First, all TDM (DS1) interfaces are deployed. Second, in a non-V.35 configuration, serial interfaces are placed under their dependent TDM interface. IP address objects are deployed under their corresponding interface.

CMNM also models the three SS7 MTP2 channels on each Cisco SLT. From these channels, you can view current SS7 MTP2 statistics.

***Figure 6-8 Cisco SLT Chassis Discovery***




# Cisco 2900XL Discovery

CMNM models ports and modules (slots) on the Cisco 2900XL series devices. The Cisco 2900 XL has 24 ports built into the chassis. In addition the Cisco 2900XL has two slots into which different cards can be installed.

During auto-discovery, CMNM retrieves the tables shown in Table 6-5.

***Table 6-5 Cisco 2900XL Discovery Tables***

| Table | Description |
|---|---|
| CISCO-C2900-MIB.c2900ModuleTable | Contains all of the module (slot) information |
| CISCO-C2900-MIB.c2900PortTable | Defines all of the ports on the chassis |
| SNMPv2-MIB.ifTable | Defines all of the interfaces on the chassis |
| RFC1213-MIB.ipAddrTable | Lists all of the IP address on a port |
| CISCO-VTP-MIB.vtpVlanTable | Lists all VLANs on the chassis |

Each entry in the c2900ModuleTable is modeled as a switch2900XLSlot object. The attribute SNMP:CISCO-C2900-MIB.c2900ModuleIndex serves as an index into the table.

Each entry in the c2900PortTable is modeled as a switch2900XLPort object. In the CMNM object model, it is placed under its dependent slot. The c2900PortTable is indexed by two attributes, the module index and the port index. The module index indicates on which slot the port resides. Module index zero indicates that the ports are dependent on the chassis, and not on a slot. The attribute c2900PortIfIndex is used to correlate the c2900PortTable to the ifTable.

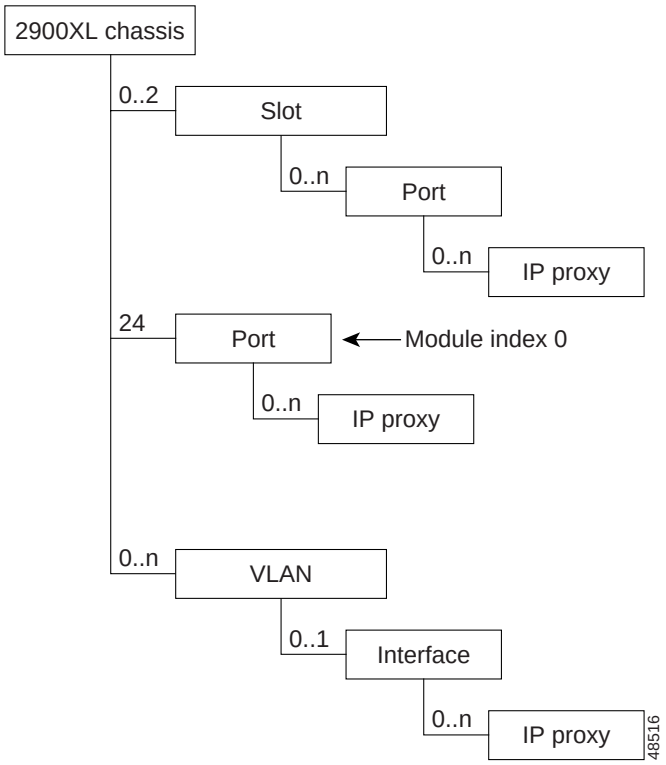
Each entry in the vtpVLANTable is modeled as a switch2900XLVLAN. In addition, each interface associated with the VLAN is displayed as children of its corresponding VLAN. In order to correlate interfaces from the ifTable to their corresponding VLANS in the vtpVLanTable, CMNM uses the description of the ifTable entry, which is of the form:

VLAN*x*

where *x* is the index of the corresponding entry in the vtpVlanTable.

The Cisco 2900XL subrack component appears as shown in Figure 6-9.

***Figure 6-9 Cisco 2900XL Chassis Discovery***




# Catalyst 5500 Discovery

CMNM models slots, VLANs, and ports on the Catalyst 5500 series devices. During auto- discovery, CMNM retrieves the tables shown in Table 6-6.

*Table 6-6 Catalyst 5500 Discovery Tables*

| Table | Description |
|---|---|
| CISCO-STACK-MIB.moduleTable | Defines all of the modules (slots) on the chassis |
| CISCO-STACK-MIB.portTable | Defines all of the ports on the chassis |
| CISCO-STACK-MIB.vlanTable | Defines all of the VLANs on the chassis |
| SNMPv2-MIB.ifTable | Defines all of the interfaces on the chassis |

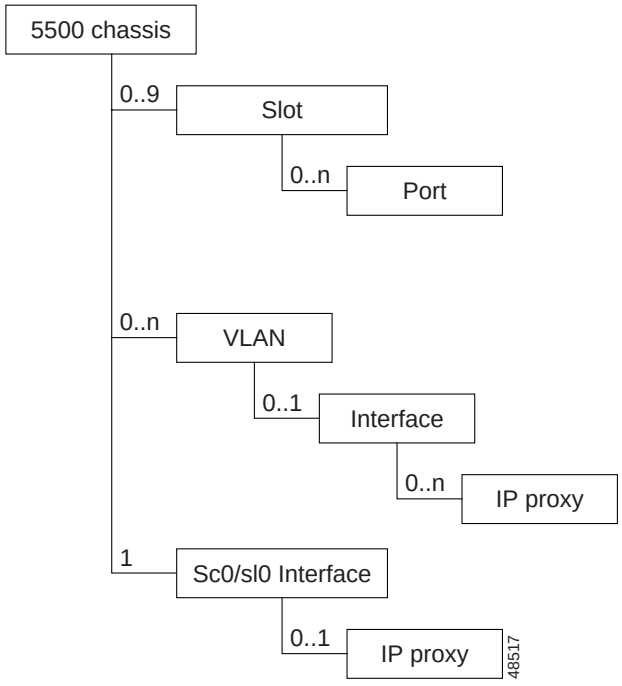
Each entry in the moduleTable is modeled as a switch5500Slot object and every entry in the portTable is modeled as a switch5500Port object. To correlate the information, the attribute portModuleIndex defines the slot on which the port is located and the portIfIndex is used to correlate the portTable to its corresponding interface in the ifTable.

Each entry in the vlanTable is modeled as a switch5500VLAN object. The attribute vlanIfIndex associates each element in the VLAN table to its corresponding interface in the ifTable. The associated interface is shown as a child of its corresponding VLAN.

The SC0 and SL0 interfaces are modeled directly under the chassis object. In the MIB, one interface has a valid IP address while the other has an IP address of 0.0.0.0. While both interfaces are modeled, only the valid IP is shown.

The Catalyst 5500 subrack component is shown in Figure 6-10.

*Figure 6-10 Catalyst 5500 Chassis Discovery*



## Cisco MGC Node Discovery

CMNM models and displays the trunking, signaling, and dial plan components associated with the active Cisco MGC host. When CMNM initially discovers a new Cisoc MGC node, it retrieves the configuration for the active Cisco MGC host by telneting into the active host, starting an MML session, and running the **prov-exp** command. This command puts the current configuration of the Cisco MGC host in a number of flat files as described in Table 6-7.

***Table 6-7 Cisco MGC Host Export Files***

| Filename | Description |
|---|---|
| config.mml | MML description of all the signaling components. |
| export_trnkgrp.dat | Line-by-line description of each of the trunk groups. |
| export_trunk.dat | Line-by-line description of each of the trunks. |
| routing.mml | MML description of all the routing components. |
| *XXX*.mml | MML description of the dial plan components, where *XXX* is the customer group ID. |

Once exported, the files are transfered back to the management system using FTP and are then parsed by CMNM. Hence CMNM can deploy objects that represent each of the signaling, trunking, and routing components.

# Synchronization

CMNM ensures that the EMS database (as provided by CEMF) is synchronized with the underlying network elements. All relevant management data within the EMS is automatically updated on receipt of a modification trap from the various network elements.

The traps in Table 6-8 are used to respond to changes in the network elements.

***Table 6-8 Network Element Configuration Traps***

| Network Element | Configuration Changed Trap |
|---|---|
| Cisco MGC host | POM: DynamicReconfiguration |
| LAN switch | coldStart, warmStart, configChange |
| Cisco SLT | reload, configChange |

When CMNM receives a POM:DynamicReconfiguration trap from the active Cisco MGC host, it resynchronizes its view of the connectivity network with that of the device.

# Managing Software Images and Configurations

CMNM lets you manage software images and configurations on the Cisco MGC node devices. You can:

- Back up (upload) the configuration of the Cisco MGC host, BAMS, Cisco SLT, and LAN switch.

- Restore (download) configuration on the Cisco MGC host, BAMS, Cisco SLT, and LAN switch.
- Download software modules and patches to Cisco MGC node devices.
- Back up (upload) software images from Cisco SLT and LAN switch.
- Automate or schedule configuration backups.

- Cancel or modify scheduled operations.
- Maintain a record of all software and configuration modifications.

The following sections detail the support for image and configuration management.

# TFTP Server

CMNM uses a TFTP server to maintain software images and device configurations. All files that are downloaded to devices come from this TFTP server. Likewise, all backups from the devices are saved to the TFTP server.

The TFTP server makes use of the standard UNIX filesystem and can be maintained by anyone with the proper UNIX permissions. The system administrator is free to place new images or configurations on the server and archive or delete old software images and configurations. CMNM does not provide any explicit support for standard filesystem maintenance functions.

The location of the TFTP directory is found in the INETD configuration file /etc/inted.conf. At startup, CMNM queries the contents of this file to figure out the location of the TFTP directory. By default, the directory (if the entry in the inetd.conf file is commented out) is /tftpboot.

# Uploading and Downloading Cisco SLT and LAN Switch Images and Configurations

CMNM lets you move IOS images and configurations to and from the Cisco SLT and LAN switch.

The download process:

- Telnets into the select devices.
- Enters enable mode.
- Copies the configuration or image from the TFTP server:

  **copy tftp flash** (to copy software image)

  **copy tftp running-config** (to copy running configuration)
- Reboots the device (if necessary):

  **reload** (for Cisco SLT)

  **reset system** (for LAN switch)

  **confirm**

The upload process:

- Telnets into the devices.
- Enters enable mode.
- Copies the configuration or image back to the TFTP server.

  **copy flash tftp** (to copy software image)

  **copy config tftp** (to copy running Catalyst configuration)

  **copy running-config tftp** (to copy running IOS configuration)
- Copies or renames the file as specified by the user.

To upload or download Cisco SLT and LAN switch configurations:

**Step 1** Under MGC-Node-View, select a node, expand it, select a Cisco SLT or LAN switch, right-click the Cisco SLT or LAN switch icon, select **Tools**, then **SLT Upload/Download** or **LAN Switch Upload/Download**.

**Step 2** Select one or more devices from the list on the left of the screen.

**Step 3** In the Transfer box, enter the information about the Cisco SLT or LAN switch:

- Name of the image or configuration file on the TFTP server
- Transfer type (configuration, image, or patch)
- IP address, login ID, and password of the TFTP server

**Step 4** Indicate at the bottom of the screen whether the device should be rebooted.

**Step 5** If you want to schedule the transfer, enter the scheduling information in the Schedule box.

**Note** To see the currently scheduled transfer operations, click the **Current** tab.

**Step 6** When you have finished, click **Download** or **Upload** as appropriate.

# Uploading and Downloading Cisco MGC Host and BAMS Images and Configurations

CMNM lets you upload and download Cisco MGC host configurations to a Cisco MGC host. You can upload BAMS configurations.

The Cisco SLT and LAN switch configurations and images are in a single file. The Cisco MGC host and BAMS configurations and patches are in many different files and directories. Hence when you specify a configuration on the TFTP server, CMNM assumes it is a directory containing all of the necessary data:

- MGC Host configurations are specified as a directory containing an MML batch-file along with supporting files (like the output from the Voice Services Provisioning Tool).
- MGC Host software patches are specified as a directory containing the software image to be installed. The installation script must be in this directory.

The download process performs a number of different steps depending on the type of device and data. In general, the following steps are performed:

- Telnets into the devices.
- Copies the configuration or patch from the TFTP server to the device.
- Runs the installation script to install the new software or runs whatever utility is necessary to load a new configuration.
- Activates the configuration or image (if necessary). This may involve rebooting the device.

Voice Services Provisioning Tool does not let you upload software images. CMNM lets you upload configuration data only from the Cisco MGC host and BAMS.

The configuration upload process performs the following steps:

- Telnets into devices.
- Extracts the current configuration (using, for example, the **prov_exp** command)

- Copies the configuration to the TFTP server.

When downloading a patch to a Cisco MGC host, CMNM performs the following steps:

- Warns you that the Cisco MGC host software will be shut down during the upgrade.
- Retrieves the patch from the TFTP repository.
- Copies the patch to the target Cisco MGC host:
  - Ensures that enough disk space is available.
  - Uses /var/tmp as the temporary storage location.
- Telnets to the target Cisco MGC host (as root for pkgadd privileges)
- Stops the Cisco MGC host daemons:
  - /etc/init.d/CiscoMGC stop
  - Waits until the processes physically stop (using UNIX ps).
- Installs the software:

  **pkgadd -n -d ./***pkgfile*
- Runs pkginfo to ensure the package was installed correctly.
- Starts the Cisoc MGC host daemons:

  /etc/init.d/CiscoMGC start
- Ensures that the processes actually stared (using UNIX ps).

To upload or download Cisco MGC host configurations or upload a BAMS configuration:

**Step 1** Under Host-View, select a host, right-click the host icon, select **Tools**, then **MGC Host Upload/Download** or under BAMS-View, select a BAMS, right-click the BAMS icon, select **Tools**, then **BAMS Upload/Download**.

**Step 2** Select one or more devices from the list on the left of the screen.

**Step 3** In the Transfer box, enter the information about the Cisco MGC hosts or BAMS:

- Name of the directory on the TFTP server containing the configuration files or name of the directory on the TFTP server where the configuration is to be stored
- Transfer type (configuration, image, or patch)
- IP address, login ID, and password of the TFTP server

**Step 4** If you want to schedule the transfer, enter the scheduling information in the Schedule box.

**Note** To see the currently scheduled transfer operations, click the **Current** tab.

**Step 5** When you have finished, click **Download** or **Upload** as appropriate.