



## Building the Network

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Once you have planned your network (see [Chapter 3, “Planning the Network”](#)), you can begin building network elements and their related aspects, such as groups, network partitions, and Network Maps.

This chapter contains the following sections:

- [4.1 What Network Elements Are Available?](#)
- [4.2 How Do I Add and Delete Network Elements?](#)
- [4.3 How Do I Build Groups?](#)
- [4.4 How Do I Configure the SNMP Community String?](#)
- [4.5 How Do I Build Network Maps?](#)
- [4.6 How Do I Discover the Network?](#)
- [4.7 How Do I Synchronize the Network?](#)
- [4.8 How Do I Test Connectivity?](#)

### 4.1 What Network Elements Are Available?

The Cisco MGM management domain contains and lists network elements (NEs) and groups of NEs. The management domain can be found as the top-level root node in the topology tree of the Domain Explorer. In the management domain, you can add, delete, and modify the following NE:

- **Groups**—Collection of groups or collection of NEs. NEs are often grouped geographically or by domain.
- **Network partitions**—Groups of users who have access to groups of NEs.
- **Network Maps**—Geographic representation of the NEs which displays the NEs in a map, and the number of alarms associated with the NE.

### 4.2 How Do I Add and Delete Network Elements?

This section contains the following information:

- [4.2.1 Prerequisites for Adding Network Elements](#)
- [4.2.2 Enabling Performance Monitoring](#)
- [4.2.3 Adding Network Elements](#)

- [4.2.4 Network Element Discovery](#)
- [4.2.5 Copying a Network Element from One Group to Another](#)
- [4.2.6 Moving a Network Element from One Group to Another](#)
- [4.2.7 Deleting Network Elements](#)
- [4.2.8 Restoring a Deleted Network Element](#)

## 4.2.1 Prerequisites for Adding Network Elements

You must enable the NE service before you can add an NE. You must also meet certain other specific prerequisites depending on the type of NE you are adding. The following aspects must be configured before adding NEs:

- Hostnames and IP addresses
- SNMP community strings
- Topology setup
- Performance monitoring (optional)

### 4.2.1.1 Enabling the NE Service

Before adding a new NE, you must enable the NE service for that NE.

The NE Service is enabled by default. However, if you need to enable the NE service:

- 
- Step 1** In the Domain Explorer window, choose **Administration > Control Panel**. The Control Panel appears.
  - Step 2** In the tree view of the Control Panel, expand **NE Service**.
  - Step 3** Select an NE type.
  - Step 4** In the property sheet of the Control Panel, click **Activate** in the Service Control field.
- 



**Note** The service is not started as a process unless you activate an NE for that particular service.

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### 4.2.1.2 Hostnames and IP Addresses

All NEs must be configured with unique hostnames and IP addresses.

## 4.2.2 Enabling Performance Monitoring

Performance monitoring is optional, but you must enable it if you want to collect performance parameters:

- 
- Step 1** In the Domain Explorer window, choose **Administration > Control Panel**. The Control Panel appears.
  - Step 2** In the tree view of the Control Panel, expand **PM Service**.

- Step 3** Select an NE type.
- Step 4** In the property sheet of the Control Panel, click **Activate** in the Service Status field.
- Step 5** In Error Level, choose the error level for alarms on the selected NE to include in the Error Log (Critical, Major, Minor, Informational, Debug, or Trace). Critical, major, minor, and informational errors are logged to the database; trace and debug information is logged to a log file.



**Caution** Cisco MGM performance will degrade significantly if the trace or debug option is left on. All operations will slow down and you may lose alarm and event notifications. Use trace or debug only when troubleshooting with a customer support engineer.

Threshold displays the number of NEs that will be serviced by one instance of the NE service.



**Note** The service is not started as a process unless you activate an NE for that particular service.

## 4.2.3 Adding Network Elements

From the Domain Explorer, you can add a single or multiple NEs using the Add Network Element(s) wizard:

- [4.2.3.1 Adding a Single Network Element](#)
- [4.2.3.2 Adding Multiple Network Elements](#)

### 4.2.3.1 Adding a Single Network Element

From the Domain Explorer, you can add a single NE:

- Step 1** Select a node in the Domain Explorer; then, choose **File > Add Network Element(s)**. You can also click the **Add Network Element(s)** tool. The Add Network Element(s) wizard appears. See [Figure 4-1](#).



**Note** You cannot add a new NE to the Discovered Network Elements or Deleted Network Elements group.

- Step 2** Enter the following information (see [Table 4-1](#) for more details):
- a. NE Model
  - b. NE Type
  - c. NE Addition—Click the **Single NE Addition** radio button
  - d. IP address

- Step 3** Click **Next**.



**Note** If you click **Finish** in this window, default values will be assigned to the remaining fields.

**Step 4** Enter the following information:

a. NE ID



**Note**

Do not use “MGM” as an NE ID because the Alarm Browser might contain Cisco MGM alarms with the source ID “MGM.” It will be difficult to distinguish between NE alarms and Cisco MGM alarms if they both have the same source ID (“MGM”). For the same reason, do not cause Cisco MGM to automatically populate an NE whose NE ID is “MGM.”

If the NE ID field is left blank, it will default to the IP address. After communication is established, Cisco MGM discovers the NE ID from the NE.

b. Operational state

c. SNMP Community String

d. SNMP Community String (Set)

e. NE Service Level User Name

f. NE Service Level Pass Word

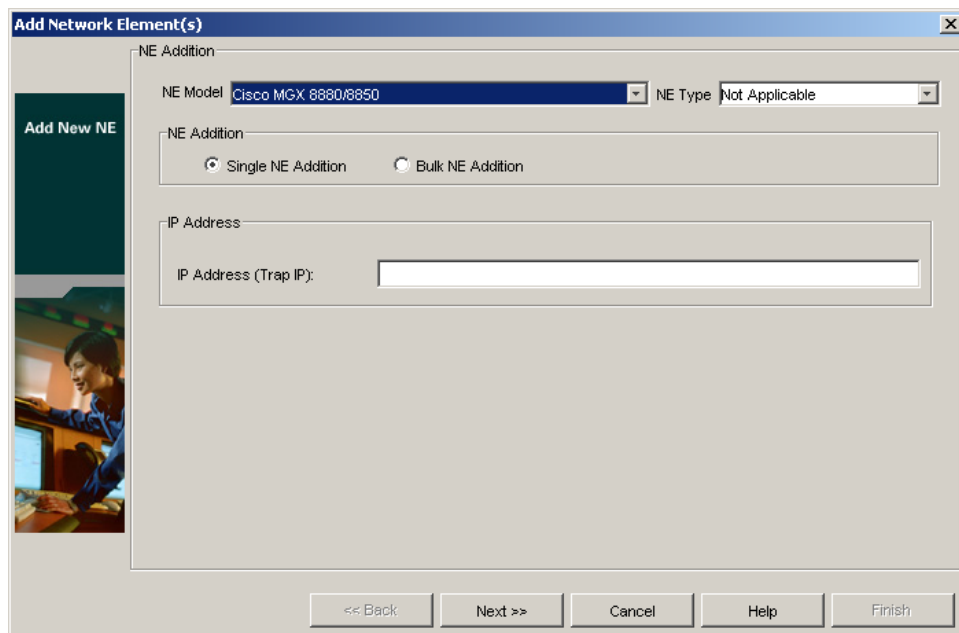
g. Description

**Step 5** Click **Finish** to add the new NE to the Domain Explorer tree.

**Step 6** Wait two to five minutes while the Cisco MGM server completes the node discovery.

**Step 7** Check to see if the communication state is correct. If Cisco MGM cannot connect to the NE, the NE displays an unavailable communication state icon in the Domain Explorer tree.

**Figure 4-1** Add Network Elements Window



### 4.2.3.2 Adding Multiple Network Elements

From the Domain Explorer, you can add multiple NEs

- Step 1** Select a node in the Domain Explorer; then, choose **File > Add Network Element(s)**. You can also click the **Add Network Element(s)** tool. The Add Network Element(s) wizard appears. See [Figure 4-1](#).



**Note** You cannot add a new NE to the Discovered Network Elements or Deleted Network Elements group.

- Step 2** Enter the following information (see [Table 4-1](#) for more details):
- NE Model
  - NE Type
  - NE Addition—(not available with Not Managed/Other Vendor NEs)—Click the **Bulk NE Addition** radio button
  - IP Address Range—Enter the IP addresses in the **From** and **To** fields of the NE and click **Add**
  - IP Address Selection—Add or remove IP addresses using the **Add** and **Remove** buttons.

- Step 3** Click **Next**.



**Note** If you click **Finish** in this window, default values will be assigned to the remaining fields.

- Step 4** Enter the following information:
- NE ID—*Display only*.
  - Operational state
  - SNMP community string
  - NE Service Level User Name
  - NE Service Level Pass Word
  - Description

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

- Step 6** Select the grouping option for the NEs.

- Step 7** Click **Finish** to add the NEs to the Domain Explorer tree.

Wait two to five minutes while the Cisco MGM server completes the node discovery.

Table 4-1 Field Descriptions for the Add Network Element(s) Wizard

Screen	Field	Description
NE Addition	NE Model	Allows you to select the NE model (Cisco MGX 8880/Cisco MGX 8850).
	NE Type	The NE Type is not available.
	NE Addition	Select Single NE Addition to add only one NE. Select Bulk NE Addition to add several NEs simultaneously. The available fields will change, depending on which item you select.
	IP Address (for single NE additions)	Allows you to enter a unique IP address for the NE. It must be in the form <i>ddd.ddd.ddd.ddd</i> , where <i>ddd</i> is a decimal octet expressed as an integer between 0 and 255. The first octet cannot be a zero.  <b>Note</b> Prior to the NE ID discovery, Cisco MGM uses the NE IP address as a temporary NE ID.  <b>Note</b> The IP address field is unavailable when adding Not Managed/Other Vendor NEs.
	From IP Address (for bulk NE additions)	Enter the beginning IP address for the range of NEs you want to add.
	To IP Address (for bulk NE additions)	Enter the ending IP address for the range of NEs you want to add. Click <b>Add</b> to add the range to the Select IP field.
	IP Address Selection	Select one or more IPs in the Deleted IP field and click <b>Add</b> to add them to the Selected IP field. Select one or more IPs in the Selected IP field and click <b>Remove</b> to remove them from the Selected IP field. Only the IPs in the Selected IP fields are affected by clicking <b>Next</b> .

Table 4-1 Field Descriptions for the Add Network Element(s) Wizard (continued)

Screen	Field	Description
NE Properties	NE ID	<p>Allows you to enter a unique name for the NE in the form of an ASCII text string. Apostrophes (') and quotation marks (") are not accepted. The NE ID you enter should be the same as the NE ID that is configured on the NE itself. If it is not the same, this field will be updated with the NE hostname.</p> <p><b>Note</b> Do not use "MGM" as an NE ID because the Alarm Browser might contain Cisco MGM alarms with the source ID "MGM." It will be difficult to distinguish between NE alarms and Cisco MGM alarms if they both have the same source ID ("MGM"). For the same reason, do not cause Cisco MGM to automatically populate an NE whose NE ID is "MGM."</p> <p><b>Note</b> If the NE ID field is left blank, it will default to the IP address. After communication is established, Cisco MGM discovers the NE ID from the NE.</p>
	Operational State	<p>Allows you to specify the operational state of the NE. There are three states:</p> <ul style="list-style-type: none"> <li>• Under Maintenance—The NE is temporarily under maintenance but requires monitoring.</li> <li>• In Service—The NE is currently deployed and requires monitoring.</li> <li>• Out of Service—The NE has been marked Out of Service and does not require monitoring.</li> </ul>
	SNMP Community String	Allows you to enter the SNMP community string for the NE. By default, the SNMP get community string is <b>public</b> and SNMP set community string is <b>private</b> .
	NE Service Level User Name	Allows you to enter the user name. The default is cisco.
	NE Service Level Pass Word	Allows you to enter the password. The default is cisco.
	Description	Allows you to enter a description of the NE.



**Note** Errors encountered while adding NEs are listed in the Error Log.

## 4.2.4 Network Element Discovery

The Cisco MGM discovery service collects information from individual NEs; discovers new NEs; updates network-level information (such as physical topology); and updates device-level information (such as inventory and alarms).



**Note** The Discovered Network Elements group can only be viewed by SuperUsers and NetworkAdmins in cases where all NEs are assigned to them.

The discovery process starts when a new NE is added to Cisco MGM. When discovery completes, all information associated with the NE (such as inventory, configuration, and physical topology) is collected and updated in Cisco MGM. By default, periodic, routine discovery occurs every 24 hours, beginning from the time the Cisco MGM server starts.

## 4.2.5 Copying a Network Element from One Group to Another

Groups for multiple NEs can easily be created in Cisco MGM. For information about creating groups, see Section 4.3 [How Do I Build Groups?](#) The same NE can be copied into different groups.

- 
- Step 1** In the Domain Explorer Hierarchy pane, select the NE to be copied.
- Step 2** Choose **Edit > Copy** (or click the **Copy** tool). This copies the NE to the clipboard. (Notice that the NE ID now appears in italics).
- Step 3** Select the group or management domain node where the NE will be pasted and choose **Edit > Paste** (or click the **Paste** tool). This pastes the contents of the clipboard under the selected node.



**Note** An NE cannot be pasted into the Discovered Network Elements or Deleted Network Elements group. Also, it cannot be pasted into a group where the same instance of the NE already exists.

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**Tip** The drag-and-drop feature can also be used to copy NEs. Hold down the **Ctrl** key on the keyboard and use the mouse to drag and drop the NE to a new location.

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Topology modification using drag and drop or copy, cut and paste is not allowed for users with Assign NEs property (Provisioner, Operator, and custom user profile) since they cannot see the entire domain.



**Note** Since they cannot see the entire domain, users with the Assign NEs property (Provisioner, Operator, and some custom user profiles) are not allowed to modify topology using copy, cut, paste, or drag and drop.

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## 4.2.6 Moving a Network Element from One Group to Another

Cisco MGM provides drag-and-drop capabilities to allow you to easily move NEs from one group to another.

- 
- Step 1** In the Domain Explorer Hierarchy pane, select the NE to be moved.
- Step 2** Choose **Edit > Cut**, then **Edit > Paste**. You can also use the mouse to drag and drop the selected NE to a new location.



**Note** You are not allowed to copy or move NEs into the Discovered Network Elements group.

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**Note** Topology modification using drag and drop or copy, cut and paste is not allowed for users with Assign NEs property (Provisioner, Operator, custom user profile) since they cannot see the entire domain.

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## 4.2.7 Deleting Network Elements

From the Domain Explorer Hierarchy pane, you can delete a single NE, multiple NEs, or out-of-service NEs:

- [4.2.7.1 Deleting a Single Network Element](#)
- [4.2.7.2 Deleting Multiple Network Elements](#)
- [4.2.7.3 Removing a Deleted Network Element](#)

### 4.2.7.1 Deleting a Single Network Element

To delete a single NE:

- 
- Step 1** In the Domain Explorer Hierarchy pane, select the NE that will be deleted. The Network Element Properties sheet appears.
- Step 2** There are two options to place an NE Out of Service:
- In the **Status** tab of the Network Element Properties sheet, set the Operational State field to **Out of Service**; then, click **Save**.
  - In the Domain Explorer, right click on the node and choose **Mark Out of Service**.
- Step 3** In the Domain Explorer Hierarchy pane, select the NE to be deleted again.
- Step 4** You can delete either a selected instance of the NE or all instances of the NE:
- Deleting the selected instance of the NE—Only the specific NE that you selected in the Domain Explorer Hierarchy pane is deleted. To delete the selected instance of the NE, choose **Edit > Delete**; then, click **Yes**. If this is the last instance of the NE, the NE is placed in the Deleted Network Elements group.
  - Deleting all instances of the NE—All NEs in the user domain that have the same NE ID are deleted. To delete all instances of the selected NE, choose **Edit > Delete All**; then, click **OK**. The NE is placed in the Deleted Network Elements group.

No client views for an NE can be opened in the Deleted Network Elements group. Also, no properties of a deleted NE can be modified. The deleted NE and its associated data are removed from all client views except the Domain Explorer.

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**Note**

Only out-of-service NEs can be placed in the Deleted Network Elements group.

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### 4.2.7.2 Deleting Multiple Network Elements

To delete multiple NEs:

- 
- Step 1** For each NE that will be deleted:
- a. In the Domain Explorer Hierarchy pane, select the NE that will be deleted. The Network Element Properties sheet appears.
  - b. Place the NE Out of Service. There are two options:

- In the **Status** tab of the Network Element Properties sheet, set the Operational State field to **Out of Service**; then, click **Save**.
- In the Domain Explorer, right click on the node and choose **Mark Out of Service**.

**Step 2** In the Domain Explorer Hierarchy pane, select again all the NEs that will be deleted. To select multiple NEs, press and hold down the **Ctrl** button; then, click each NE that will be deleted.

**Step 3** You can delete the selected instance of the NEs or all instances of the NEs:

- Deleting the selected instance of the NE—Only the specific NEs that you selected in the Domain Explorer Hierarchy pane will be deleted. To delete the selected instance of the NEs, choose **Edit > Delete**; then, click **Yes** on the confirmation dialog box. If the selected NEs are the last instance of the NE, the NEs are placed in the Deleted Network Elements group.
- Deleting all instances of the NEs—All NEs in the user domain that have the same NE ID as the NE being deleted will be deleted. To delete all instances of the selected NEs, choose **Edit > Delete All**; then, click **OK** in the confirmation dialog box. The NEs are placed in the Deleted Network Elements group.

**Note**

Both the Delete and Delete All menu options are enabled if at least one of the selected NEs can be deleted. The confirmation dialog box lists the NEs that can and cannot be deleted.

**Note**

You can use the mouse to drag and drop the selected NEs to the Deleted Network Elements group only if all the selected NEs can be deleted.

### 4.2.7.3 Removing a Deleted Network Element

A deleted NE is placed in the Deleted Network Elements group.

**Step 1** In the Domain Explorer Hierarchy pane, click the Deleted Network Elements group.

**Step 2** Click the NE that will be removed from the Cisco MGM domain.

**Step 3** Choose **Edit > Delete**; then, click **Yes**. This removes the NE from the client view and deletes all records associated with the NE from the database.

**Note**

- Wait until all records associated with the NE are deleted from the database before adding them back again. Pruning operation takes about 5 minutes.
- The Deleted Network Elements group is seen by users who have add\_delete\_NE\_group operation permission. You can purge or undelete an NE that is in the Deleted Network Elements group only if that NE was assigned to you.

## 4.2.8 Restoring a Deleted Network Element

You can restore an NE to its previous location in the Domain Explorer Hierarchy pane from the Deleted Network Elements group.

- 
- Step 1** In the Domain Explorer Hierarchy pane, click the Deleted Network Elements group.
- Step 2** Click the NE that will be restored.
- Step 3** Choose **Edit > Undelete**.
- All instances of the NE are restored to their previous locations in the Domain Explorer Hierarchy pane.
- 

**Note**

If the original parent group no longer exists, Cisco MGM does not recreate the group. Instead, Cisco MGM restores the NE under the management domain node.

The Deleted Network Elements group is seen by users who have `add_delete_NE_group` operation permission. You can purge or undelete an NE that is in the Deleted Network Elements group only if that NE was assigned to you.

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## 4.3 How Do I Build Groups?

A group is a collection of objects which are related in some way; for example, they may all be the same type of equipment or all belong to the same customer.

NEs in the Domain Explorer are organized in groups, which are comprised of NEs and/or other groups. NEs are often grouped geographically or by domain. The same NE or group can be assigned to different groups.

The Group Properties pane displays information about the group that is currently selected in the Domain Explorer Hierarchy pane. [Table 2-1](#) describes the Status tab fields. [Table 2-2](#) describes the Identification tab fields.

This section contains the following information:

- [4.3.1 Adding Groups](#)
- [4.3.2 Copying Groups](#)
- [4.3.3 Moving Groups](#)
- [4.3.4 Deleting Groups](#)

### 4.3.1 Adding Groups

- 
- Step 1** Select a node or group in the Domain Explorer Hierarchy pane.

**Note**

Adding a new group to the Discovered NEs or Deleted NEs group is not allowed.

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- Step 2** Choose **File > New Group** (or click the **Add a New Group** tool). The New Group dialog box appears.

**Step 3** Enter the following information in the New Group dialog box.

**Table 4-2** *Field Descriptions for the New Group Dialog Box*

Field	Description
Group ID	Enter a unique name for the group.
Location Name	Enter a geographic location for the group.
Description	Enter a description of the group.

**Step 4** Click **OK**.

## 4.3.2 Copying Groups

Domains for multiple users can easily be created in Cisco MGM. Just copy the same groups in different domains, so that users who work different shifts can use the same group.

- Step 1** In the Domain Explorer Hierarchy pane, select the group to be copied.
- Step 2** Choose **Edit > Copy** (or click the **Copy** tool). This copies the group to the clipboard. (Notice the group name now appears in italics.)
- Step 3** Select the location where the group will be pasted and choose **Edit > Paste** (or click the **Paste** tool). This pastes the contents of the clipboard under the selected group.



**Note** A group cannot be pasted into the Discovered NEs or Deleted NEs group.



**Tip** The drag and drop feature can also be used to copy groups. Hold down the **Ctrl** key and use the mouse to drag and drop the group to a new location.

Since they cannot see the entire domain, users with the Assign NEs property (Provisioner, Operator, and some custom user profiles) are not allowed to modify topology using copy, cut, paste, or drag and drop.

## 4.3.3 Moving Groups

Cisco MGM provides drag-and-drop capabilities to easily move groups in the Domain Explorer Hierarchy pane.

- Step 1** In the Domain Explorer Hierarchy pane, select the group to be moved.
- Step 2** Use the mouse to drag and drop the selected group to a new location.



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**Note** Groups cannot be moved into the Discovered NEs or Deleted NEs groups.

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**Tip**

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The Cut and Paste tools can also be used to move groups.

Since they cannot see the entire domain, users with the Assign NEs property (Provisioner, Operator, and some custom user profiles) are not allowed to modify topology using copy, cut, paste, or drag and drop.

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## 4.3.4 Deleting Groups

Cisco MGM allows you to delete a single group or multiple groups:

- [4.3.4.1 Deleting a Single Group](#)
- [4.3.4.2 Deleting Multiple Groups](#)

### 4.3.4.1 Deleting a Single Group

- 
- Step 1** In the Domain Explorer Hierarchy pane, select the group to be deleted.
- Step 2** You can delete either the selected instance of the group or all instances of the group:
- To remove the selected instance of the group, choose **Edit > Delete**; then, click **Yes** in the confirmation dialog box.
  - To remove all instances of the selected group, choose **Edit > Delete All**; then, click **Yes** in the confirmation dialog box.



---

**Note** Before deleting the last instance of a group, the group must be empty. Move all of the NEs and groups that the group contains to a different group.

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### 4.3.4.2 Deleting Multiple Groups

- Step 1** In the Domain Explorer Hierarchy pane, select the group to be deleted. Select multiple groups by pressing and holding down the **Ctrl** key, then click each group that will be deleted.
- Step 2** You can delete either the selected instance of the groups or all instances of the groups:
- To remove the selected instance of the groups, choose **Edit > Delete**; then, click **Yes** in the confirmation dialog box.
  - To remove all instances of the selected groups, choose **Edit > Delete All**; then, click **Yes** in the confirmation dialog box.



#### Note

Before deleting the last instance of a group, the group must be empty. Move all of the NEs and groups that the group contains to a different group.

## 4.4 How Do I Configure the SNMP Community String?

Cisco MGM configures the community strings for SNMP management and supports various multi-service-switching devices.



#### Caution

The community strings on the devices and the community strings used by Cisco MGM do not sync up automatically (except at the initial stage when the community strings on the devices are at default). You have to explicitly change them on both sides (using the Network Element Property pane in the Domain Explorer on Cisco MGM and the command line interface (CLI) on the switch). See [4.4.2 Changing Community Strings Using the Domain Explorer](#) and [4.4.3 Changing Community Strings Using the CLI](#). If this is not done, all SNMP requests fail, and the Cisco MGM database is inconsistent with the network.

To configure the SNMP community string, you must change the community strings on the devices through the CLI. SSH or Telnet to the switch to configure the community strings at the switches. The community strings are configured for the Cisco MGX PXM45-based products (Cisco MGX 8880, and Cisco MGX 8850 (PXM45)).

[Table 4-3](#) describes the various options involved in configuring the SNMP.

**Table 4-3** *SNMP Configuration Options*

Option	Description
Domain Explorer, Network Element Property pane, NE Authentication tab	<p>After saving the community strings information, the Cisco MGM processes use the new community strings for SNMP accesses.</p> <p>Since users must configure the community strings on both the devices through CLI, and at the Cisco MGM stations through the Domain Explorer, there is a possibility of typing in mismatched community strings. This results in the node with the mismatched community strings either not discovered or unreachable to Cisco MGM.</p> <p><b>Note</b> Configured community strings cannot contain underscore ( _ ) or at ( @ ) signs. Also, spaces are not allowed in community strings and Service Level passwords.</p>
SNMP access security	Enter the <b>cnfsnmp</b> command on Cisco MGM by using a secured shell to change the community strings and passwords.

These tasks are used to configure the SNMP community string:

- [4.4.1 Setting Up Nonstandard Community Strings](#)
- [4.4.2 Changing Community Strings Using the Domain Explorer](#)
- [4.4.3 Changing Community Strings Using the CLI](#)
- [4.4.4 Changing Service Level Passwords Using the Domain Explorer](#)
- [4.4.5 Changing the Service Level Passwords Using the CLI](#)

## 4.4.1 Setting Up Nonstandard Community Strings

The standard community strings are defined as default community strings. If you configure the standard community strings to a different value, the standard community strings are then defined as nonstandard community strings.

To set up nonstandard community strings or to change an Service Level password, use the NE Authentication tab in the Domain Explorer.



**Note**

This method will affect only Cisco MGM. You must make sure that community strings and passwords within Cisco MGM are in agreement with those on the switches.

## 4.4.2 Changing Community Strings Using the Domain Explorer

To change the SNMP `get` and `set` community strings for selected nodes:

- 
- Step 1** In the Domain Explorer Hierarchy pane, select the node.
  - Step 2** In the NE Authentication tab, you can change the SNMP Community String to change the SNMP `get` community string, or change the SNMP Set Only Community String.
  - Step 3** Click **Save**.
- 

## 4.4.3 Changing Community Strings Using the CLI

To change the SNMP `get` community strings for selected nodes:

- 
- Step 1** Open a terminal window and SSH or Telnet to the switch.
  - Step 2** Enter the `cnfsnmp` command to change the SNMP `get` community string for the selected nodes as follows:

```
xxyyzz% cnfsnmp community [ro|rw]
```

where `ro` is the SNMP `get` community string and `rw` is the SNMP set only community string

- Step 3** Configure the SNMP `get` community string for the selected switch as follows:

```
xxyyzz%cnfsnmp community public ro
xxyyzz%
```

Then check that the community string has changed. Enter:

```
dspsnmp
```

You will see output similar to the following example:

```
xxyyzz.7.PXM.a > dspsnmp
xxyyzz System Rev: 05.00 Dec. 14, 2004 20:04:14 GMT
MGX8850 Node Alarm: MAJOR
Community (rw): private
Community (ro): public
System Location: building 3
System Contact:
```

To change the SNMP `set` community strings for a node or switch:



### Note

The following procedure changes the SNMP set community string for the node that you SSH or Telnet to, not for all instances of that node. You must change the SNMP set community string on all instances of the node.

- 
- Step 1** Open a terminal window and SSH or Telnet to the switch.



**Step 2** Enter the **cnfsnmp** command to change the SNMP `set` community string for all nodes as follows:

```
xyyyz% cnfsnmp community private rw
xyyyz%
```

Then check that the community string has changed. Enter:

```
dspsnmp
```

You will see output similar to the following example:

```
xyyyz.7.PXM.a > dspsnmp
xyyyz System Rev: 05.00 Dec. 14, 2004 20:04:14 GMT
MGX8850 Node Alarm: MAJOR
Community (rw): private
Community (ro): public
System Location: building 3
System Contact:
```

## 4.4.4 Changing Service Level Passwords Using the Domain Explorer

To change the Service Level password for the current Service Level user for all nodes:

- 
- Step 1** In the Domain Explorer Hierarchy pane, select the node.
  - Step 2** In the NE Authentication tab, change the NE Service Level Password. Confirm the change, enter the password in the Confirm NE Service Level Password field.
  - Step 3** Click **Save**.
- 

## 4.4.5 Changing the Service Level Passwords Using the CLI

To change the Service Level password for the current Service Level user:



### Note

The following procedure changes the Service Level Password for the node that you SSH or Telnet to, not for all instances of that node. You must change the Service Level Password on all instances of the node.

- 
- Step 1** Open a terminal window and SSH or Telnet to the switch.
  - Step 2** Enter the **cnfpasswd** command to change the Service Level password for all nodes. The following example is shown:

```
xyyyz.7.PXM.a >
xyyyz.7.PXM.a > cnfpasswd
Enter existing password:
Enter new password:
Re-enter new password:
Local password for user cisco changed.
```

- Step 3** When you are prompted for a password, you must:
- Enter the existing password.
  - Enter the new password.
  - Reenter the new password for confirmation.

## 4.5 How Do I Build Network Maps?

Network map backgrounds are provided by default as part of Cisco MGM, and are used to display a geographical layout of the network.

The Network Map consists of three areas:

- The right side displays a map with the individual groups, NEs, and link icons.
- The upper left side displays the position of the map on the right side with respect to a larger world map.
- The lower left side displays the domain, or group properties, including the number of alarms and ID.

This section contains the following information:

- [4.5.1 Customizing a Network Map](#)
- [4.5.2 Viewing a Node in the Network Map](#)
- [4.5.3 Modifying a Node Icon or a Map Background Image](#)
- [4.5.4 Saving Changes to the Network Map](#)

### 4.5.1 Customizing a Network Map

- Step 1** In the Domain Explorer Hierarchy pane, click a node and choose **File > Network Map** (or click the **Open Network Map** tool). See [Figure 4-2](#).



**Note** There is no Network Map for the Discovered NEs or Deleted NEs groups.

- Step 2** Use the Edit menu in the Network Map window to customize the Network Map. The Edit menu options are detailed in [Edit Menu Options Table 4-4](#).

**Table 4-4** Edit Menu Options

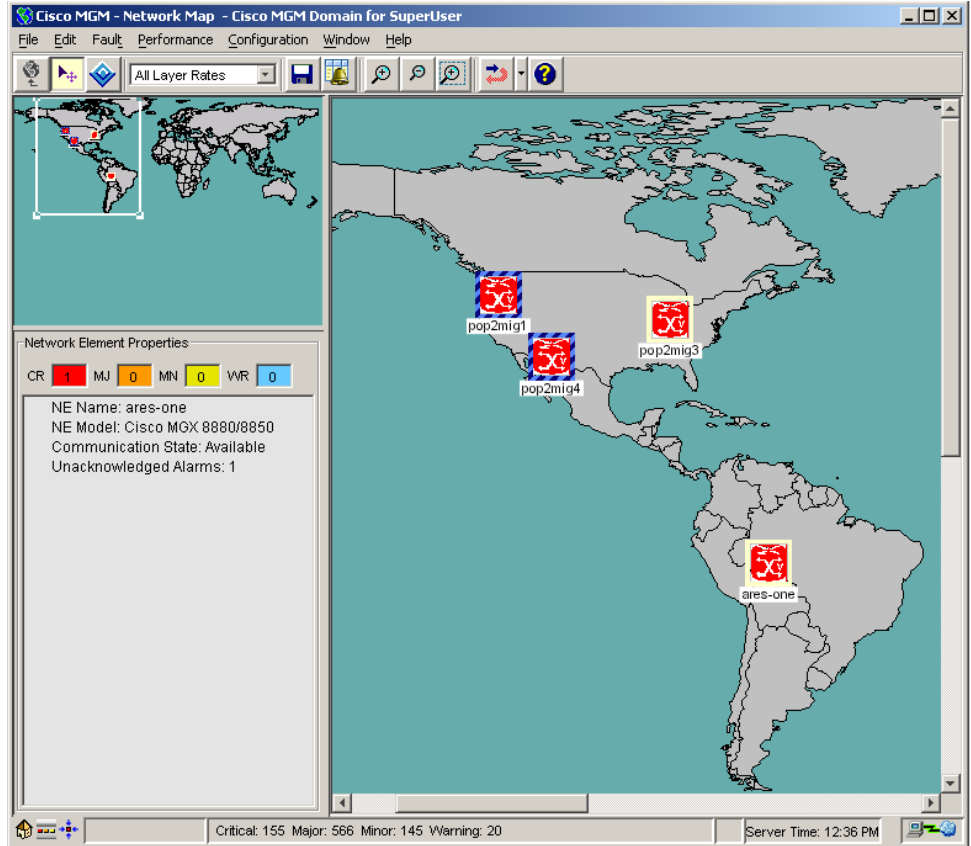
Edit Menu Option	Description
Enable Drag	Enables the drag-and-drop functionality.
Enable Offview	Enables the display of off-view icons in the selected Network Map window. If an NE has a link to an NE on a different map, the off-view NE is represented by an off-view icon. <b>Note</b> The off-view icon serves as a hyperlink to the map that contains the NE at the opposite end of the link.

**Table 4-4** *Edit Menu Options (continued)*

<b>Edit Menu Option</b>	<b>Description</b>
Change Map Background	Choose a different geographic background image for the selected view. Choose one of the image files packaged with Cisco MGM, or use another image file (not packaged with Cisco MGM).
Change Node Icon	Choose a new icon for the selected node.
Zoom In	Choose to change the magnification of the icons.
Zoom Out	Choose to make all nodes visible.
Zoom Area	Selects the area that you want to view. When selected, the pointer changes to a cross mark in the Network Map and allows you to select the area that you want to view.
Circular Layout	Arranges and displays the nodes in a circle.
Spring Layout	Arranges and displays the nodes according to the links that connect the NEs.
Table Layout	Arranges and displays the nodes in such a way that the nodes are arranged in a grid, or table. The nodes are arranged as close together as possible.
Declutter Layout	Arranges the existing nodes so that they do not overlap. This layout is used to handle nodes that appear on top of each other when you zoom out.

- Step 3** The off-view icons in the Network Map can be enabled or disabled. To enable or disable the off-view icons:
- Choose **Edit > User Preferences**.
  - Click the **Map Preferences** tab.
  - Check the **Show Off View Icons** check box to show off-view icons in the Network Map, or leave the check box unchecked to hide off-view icons.
  - Click **OK**.
- Step 4** Choose whether Cisco MGM truncates long map node names by the first characters or by the ending characters:
- Return to the Domain Explorer window and choose **Administration > Control Panel**.
  - Click **UI Properties**.
  - In the Domain Management area, specify the truncation preference and click **Save**.
- Step 5** Choose whether to use multiple windows or a single window for navigation:
- Choose **Edit > User Preferences**.
  - Click the **Map Preferences** tab.
  - Check the **Open Network Map in New Window** check box to open a new window for subsequent map views, or uncheck the check box to open subsequent map frames in the same window.
  - Click **OK**.

Figure 4-2 Network Map Window



## 4.5.2 Viewing a Node in the Network Map

Icons in the Network Map are displayed based on the nodes you select in the Domain Explorer.

Launching the Network Map from the following nodes displays different results:

- From the Cisco MGM domain in the Domain Explorer—Displays all the groups in the Cisco MGM Domain. If you double-click on a group in the Network Map, another Network Map window appears and all the NEs that belong to that group are displayed.
- From a particular group in the Domain Explorer—Displays all NEs that belong to that group.
- From a specific NE in the Domain Explorer—Displays the selected NE.

When the Network Map is launched from the Cisco MGM domain, it displays a world map with the individual groups, network partition, or NEs icons. To view a particular region or icon, adjust the zoom level or pan position.

### 4.5.2.1 Adjusting the Zoom Level or Pan Position

- 
- Step 1** In the Domain Explorer Hierarchy pane, click a node and choose **File > Network Map**. The Network Map appears and the node is preselected. See [Figure 4-2](#).
- Step 2** In the Network Map, choose **Edit > Zoom In**, **Edit > Zoom Out**, or **Edit > Zoom Area** to adjust the zoom level. You can also click the **Zoom In**, **Zoom Out**, or **Zoom Area** tool.
- Step 3** To adjust the pan position, click the box in the upper-left side of the Network Map and use the mouse to drag and drop it to the desired region. Use the scroll bars to pan the view to a different region.
- Step 4** To adjust the pan position area, use the mouse to click the corner of the box, and drag to include the required area.
- 

## 4.5.3 Modifying a Node Icon or a Map Background Image

[Appendix A, “Icons and Menus”](#) details the icons which are used in Cisco MGM.

The icons in the Network Map can be customized. Images smaller than 640 x 480 pixels by default appear surrounded by blank space in the upper-left corner of the window. Images larger than 1024 x 768 pixels by default appear with scroll bars. Icon images are 32 x 32 pixels. Cisco MGM supports nonanimated GIF and shapefile format icons and maps. Shapefile is a universal standard for data file that allows users to zoom in and zoom out without losing details.



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**Note** The size of the map file should not exceed 100 KB.

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This section contains the following information:

- [4.5.3.1 Modifying a Node Icon](#)
- [4.5.3.2 Modifying a Map Background](#)

### 4.5.3.1 Modifying a Node Icon

- 
- Step 1** In the Domain Explorer Hierarchy pane, click a node and choose **File > Network Map**. See [Figure 4-2](#).
- Step 2** In the Network Map window, click a node and choose **Edit > Change Node Icon**. The Select Node Icon File dialog box appears.
- Step 3** Select a node icon from within the default file system at C:\Cisco\MediaGatewayManagerClient\images\mapicons for Windows systems or at /opt/CiscoMGMClient/images/mapicons for Unix systems.
- Step 4** After choosing an icon, click **Open**. The new icon appears in the Network Map.
- Step 5** Choose **File > Save** to save the changes.
-

### 4.5.3.2 Modifying a Map Background

- 
- Step 1** In the Domain Explorer Hierarchy pane, click a node and choose **File > Network Map**. See [Figure 4-2](#).
- Step 2** In the Network Map window, click in the map background and choose **Edit > Change Map Background** or right-click in the map background and choose **Change Map Background**. The Select Background Map dialog box appears.
- Step 3** Select a background image from within the default file system at C:\Cisco\MediaGatewayManagerClient\images\mapbkgnds for Windows systems or at /opt/CiscoMGMClient/images/mapbkgnds for Unix systems. Add user-defined images in this file system, or click **Create New Folder** and save user-defined images in a customized folder within this directory.
- Step 4** After choosing a map background, click **Open**. The new map background appears in the Network Map.
- Step 5** Choose **File > Save** to save the changes.
- 



#### Note

When you add NEs or groups to a group or to the top-level domain, the coordinates of those objects on the related Network Map are initially null, so Cisco MGM automatically positions the objects. If you move an object manually and save the map, the object has fixed coordinates. Therefore, if you open a map and find an icon in an unexpected position, the object most likely was never positioned manually and saved and was therefore positioned automatically. To fix the icon location, manually move the object to the correct position and save the map.

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### 4.5.4 Saving Changes to the Network Map

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- Step 1** In the Domain Explorer Hierarchy pane, click a node and choose **File > Network Map**. See [Figure 4-2](#).
- Step 2** After making the necessary changes to the map background, node icon, and node coordinates in the Network Map window, you can save your settings by using one of the following methods:
- **Save**—Choose **File > Save** (or click the **Save Changes** tool) to save your settings. Your settings become a custom map that does not affect the default map for the nodes currently displayed in the Network Map. Users who have not saved their custom map will still see the default map for those nodes.
  - **Save As Default**—Choose **File > Save As Default** to save your settings as the default settings. Your settings become the default map for the nodes under subgroups currently displayed in the Network Map and this default map is seen by users who have not saved their custom map for those nodes. There can only be one default setting per group of nodes in the Network Map.



#### Note

The Save As Default menu option is disabled on the Cisco MGM Management Domain node.

**Save As Default** is only available for nodes under sub-groups.

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- Revert To Default—Choose **File > Revert to Default** to cancel your settings and revert to previous settings. Any custom map you created for the nodes under subgroups currently displayed in the Network Map will be erased. The Network Map reverts to the default map assigned to these nodes.



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**Note** **Revert to Default** is only available for nodes under sub-groups.

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## 4.6 How Do I Discover the Network?

The Cisco MGM discovery service:

- Collects information from individual MGX8880 and MGX8850 NEs
- Discovers new NEs
- Updates device-level information (such as inventory and alarms).

Cisco MGM supports discovery for MGX8880 and MGX8850 chassis and sub-chassis components using IP addresses, address list, or IP address range as input.

The specific NE components to be discovered and displayed in the EMS GUI are:

- PXM45 card
- VXSM card
- VISM-PR card
- RPM-XF card
- RPM-PR card
- AXSM/B card
- AXSME card
- SRME card
- SRME/B card
- Connections

Cisco MGM provides sub-chassis component discovery (configuration upload and parse) and sync up, as well as, autonomous traps processing of configuration changes. Sync up is initiated periodically.



**Note**

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The Discovered Network Elements group can only be viewed by SuperUsers and NetworkAdmins in cases where all NEs are assigned to them. Therefore, in the Add Network Element(s) wizard, the grouping option “Group the Discovered NE(s) in the Discovered Network Elements Group” is not available.

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This section contains the following information:

- [4.6.1 Discovering NEs](#)

## 4.6.1 Discovering NEs

The network discovery service in Cisco MGM collects information from individual NEs, discovers new NEs added to the network, and computes network-level information, such as physical topology, and discrepancies.

When you add a new NE to Cisco MGM, the discovery process starts. When the process finishes, all of the NE information (such as inventory, configuration, physical topology, and discrepancies) is collected and Cisco MGM is updated.

## 4.7 How Do I Synchronize the Network?

The Cisco MGM server and managed nodes must be synchronized with the same date and time. If the Cisco MGM server and managed nodes do not have the same date and time, there might be inconsistencies in retrieving time-sensitive data.

This section contains the following information:

- [4.7.1 Viewing Clocking Sources](#)

### 4.7.1 Viewing Clocking Sources

Cisco MGM supports manual clock configuration. This configures both a primary and secondary clock source, which are distributed throughout the network. The secondary clock source takes over if the primary clock source fails. You can configure a network setup with one master clock source, and a secondary to ensure network clock stability.

On Cisco MGX 8850 (PXM45) switches, clock source configuration is done on a PXM45 card, and clock sourcing information is passed to other nodes over AXSM lines.

Clock synchronization is done directly on the Cisco MGM8880 using the CLI.

These topics are used to manage and configure clocking sources:

- [4.7.1.1 Configuring Global Clocking](#)
- [4.7.1.2 Displaying the List of Available Clock Sources](#)
- [4.7.1.3 Displaying the List of Manual Clock Sources](#)
- [4.7.1.4 Creating a Manual Clock Source](#)

#### 4.7.1.1 Configuring Global Clocking

To configure global clocking:

- 
- Step 1** In the Domain Explorer Hierarchy pane, right-click the node and choose **Configuration > MGX8880/8850 MGX > Configuration Center**.
  - Step 2** Drag and drop the node from the Hierarchy pane to the right hand pane.
  - Step 3** Click the **Elements** tab to display the Configuration Window for Elements.
  - Step 4** Click the **Clocking** tab to display Global Clocking Configuration window. See [Figure 4-3](#).
  - Step 5** Choose **Global Clocking Configuration** from the **Category** drop-down arrow.



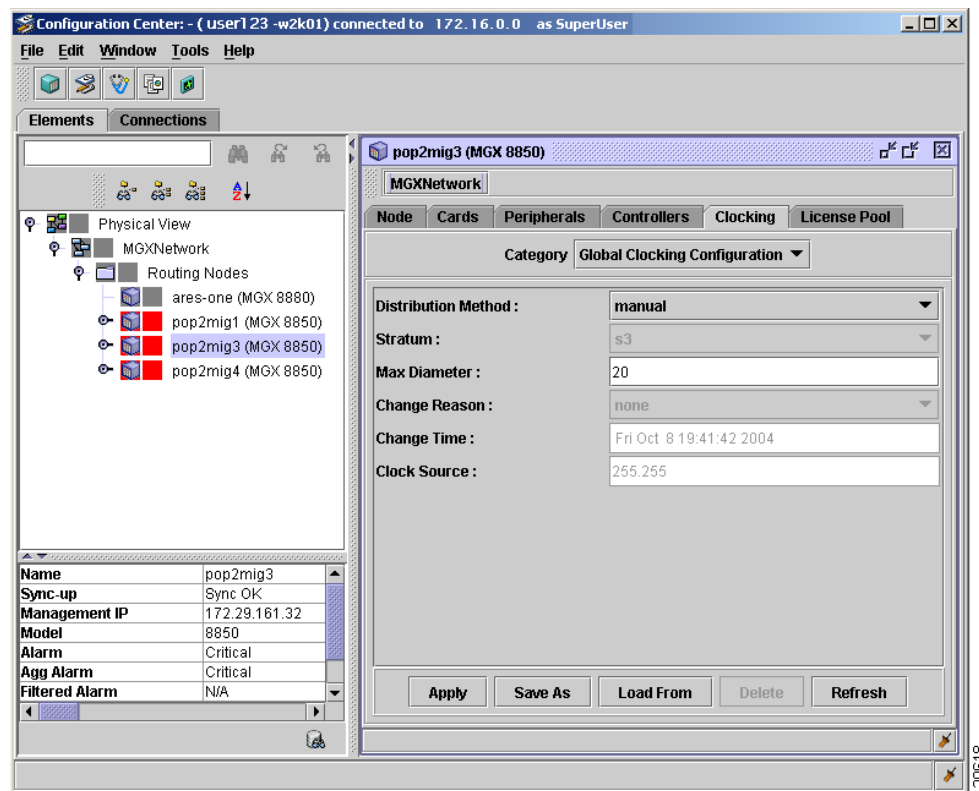
- Step 6** The **Distribution Method** is **manual**. This specifies that the network clock source is statically configured in the device.
- Step 7** Enter the maximum network diameter, measured in hops, in the **Max Diameter** field. The range is from 3-20. The default value is 20.



**Note** Change Time—The time when the global clocking was configured.  
Clock Source—The clock source from the list of available clocking source

- Step 8** Click **Apply** to apply the global clocking configuration settings.

**Figure 4-3** Configuration Center—Clocking Tab



### 4.7.1.2 Displaying the List of Available Clock Sources

To display the available clock sources:

- Step 1** In the Domain Explorer, right-click the PNNI node from the Hierarchy pane and choose **Configuration Center**.
- Step 2** Click the **Elements** tab to display the Configuration Window for Elements.

- Step 3** Click the **Clocking** tab to display Clocking Configuration window. See [Figure 4-3](#).
- Step 4** Choose **Available Clock Sources** to display the list of available clock sources from the **Category** drop-down arrow.
- 

### 4.7.1.3 Displaying the List of Manual Clock Sources

To display a list of manual clock sources:

- Step 1** In the Domain Explorer, right-click the PNNI node from the Hierarchy pane and choose **Configuration Center**.
- Step 2** Click the **Elements** tab to display the Configuration Window for Elements.
- Step 3** Click the **Clocking** tab to display Clocking Configuration window. See [Figure 4-3](#).
- Step 4** Choose **Manual Clock Sources** from the **Category** drop-down arrow.
- 

### 4.7.1.4 Creating a Manual Clock Source

To create a manual clock source:

- Step 1** In the Domain Explorer, right-click the PNNI node from the Hierarchy pane and choose **Configuration Center**.
- Step 2** Click the **Elements** tab to display the Configuration Window for Elements.
- Step 3** Click the **Clocking** tab to display Clocking Configuration window. See [Figure 4-3](#).
- Step 4** Choose **Manual Clock Sources** from the **Category** drop-down arrow.
- Step 5** Click **Create** to display the Manual Clock Source Configuration Window.
- Step 6** Choose one of the following clock source options from the **Priority** drop-down arrow:
- **primary**— Configures an available network clock source to be the primary manual clock source.
  - **secondary**—Configures an available network clock source to be the secondary manual clock source.
  - **default**—Configures an available network clock source to be the default manual clock source.
- Step 7** Enter the index value that is used to identify the primary, secondary, or default manual clock source in the **Clock Source Index** field.
- Step 8** Enter the description of the clock source in the **Clock Source** field.
- Step 9** Ensure that the health of the clock source is correct from the **Health** drop-down arrow.
- Step 10** Click **Apply** to create a manual clock source.
-

## 4.8 How Do I Test Connectivity?

**Note**

A diagnostic check can be run at the node level to verify that selected nodes are being managed correctly by Cisco MGM. See [“5.2.10.2 Running a Diagnostic Check at the Node Level”](#).

Testing NE connectivity occurs at the management protocol level (SNMP, or CORBA).

- 
- Step 1** In the Domain Explorer Hierarchy pane, select the NE and choose **Fault > Diagnostic Center**.
- Step 2** Click the **Manageability** tab to display the Node Login Information.
- Step 3** Enter the Service Level username and password.
- Step 4** Click **Check Manageability**. The following Manageability Check Results are displayed:
- Node ID
  - Node Name
  - IP Reachability
  - FTP Configuration
  - Community String Configuration
  - Trap IP Configuration
-

