



Directory Administration Tool

This chapter describes the Directory Administration Tool (DAT) including information about:

- [How to Login](#)
- [How to Manage Devices](#)
- [How to Manage Groups](#)
- [How to Manage Applications](#)
- [Managing Directory Setup](#)
- [How to Manage Bulk Data](#)
- [Managing IMGW Parameters](#)

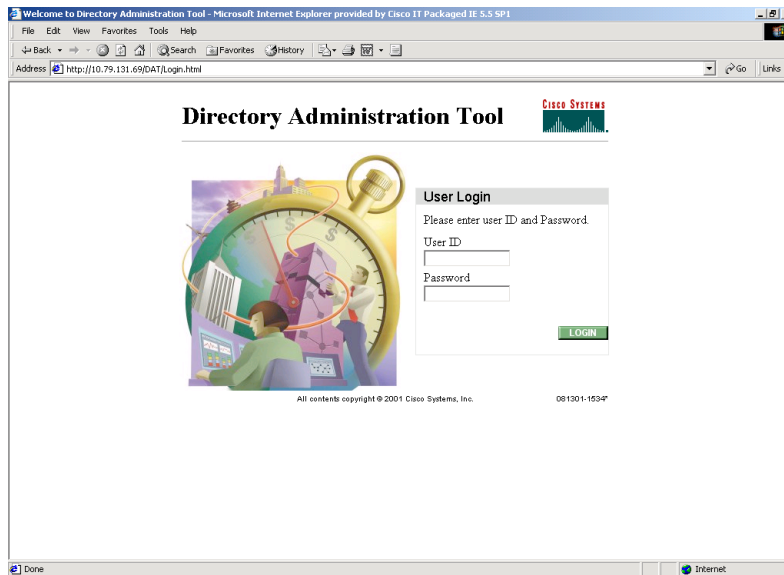
The Data administration Tool (DAT) presents you with a web-based user interface that allows you to populate and manage the data in the directories. You can View/Add/Delete/Modify CNS agent-enabled devices and legacy devices and switches devices (see [“Intelligent Modular Gateway” section on page 1-10](#)), groups of devices, and applications in the directory. Also, you can View/Add/Delete/Modify events specific to each application. DAT also provides you with the additional capability of bulk data upload.

How to Login

To connect to the DAT user interface, follow these steps:

-
- Step 1** From the Tools main menu of the Cisco CNS Configuration Engine 1.4 user interface, click **DAT**. The login window appears (see [Figure 4-1](#)).

Figure 4-1 Directory Administration Tool Login Window



Step 2 Enter your **User ID**.

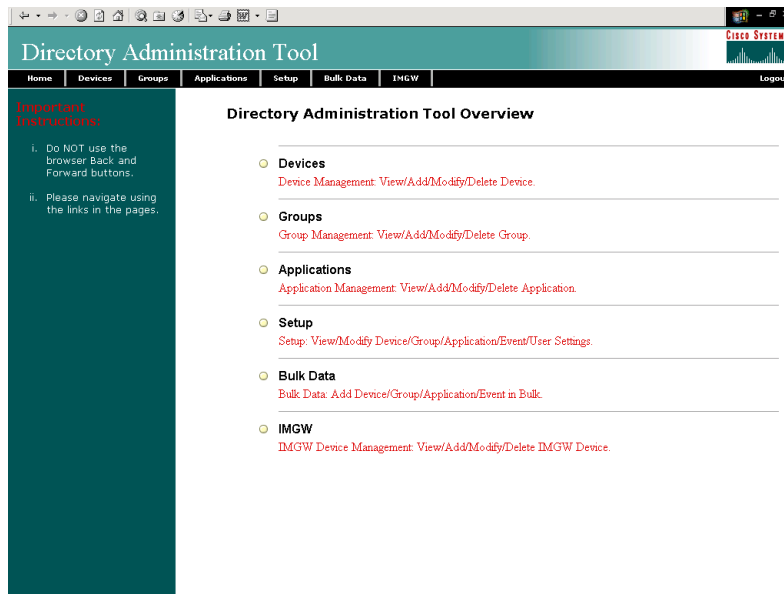
This is the user name for the Cisco CNS Configuration Engine 1.4 administrative account that you entered during **Setup**.

Step 3 Enter your password.

Step 4 Click **LOGIN**.

The Directory Administration Tool Home page appears (see Figure 4-2).

Figure 4-2 Directory Administration Tool Home Page



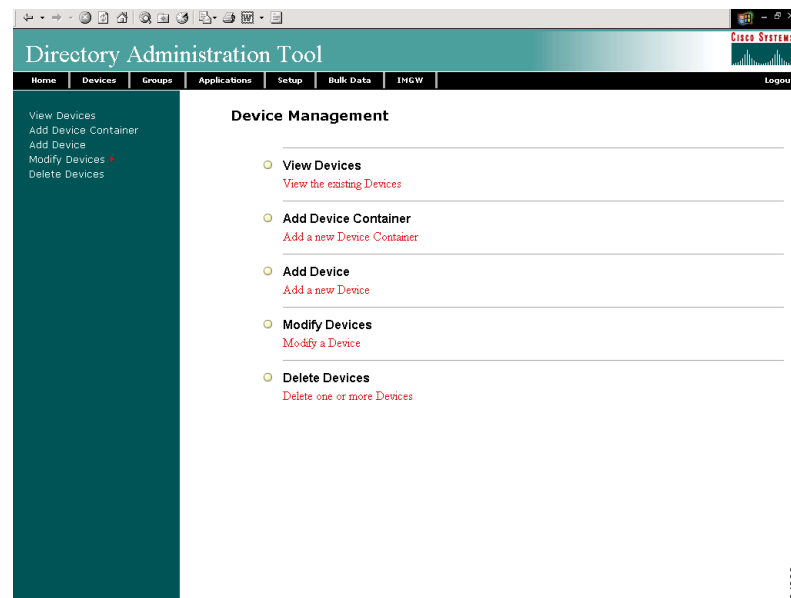
How to Log Out

To log out of the system, click on **Logout** link.

How to Manage Devices

To view and modify devices, from the Home page, click **Devices**. The Device Management page appears (see [Figure 4-3](#)).

Figure 4-3 Device Management Page

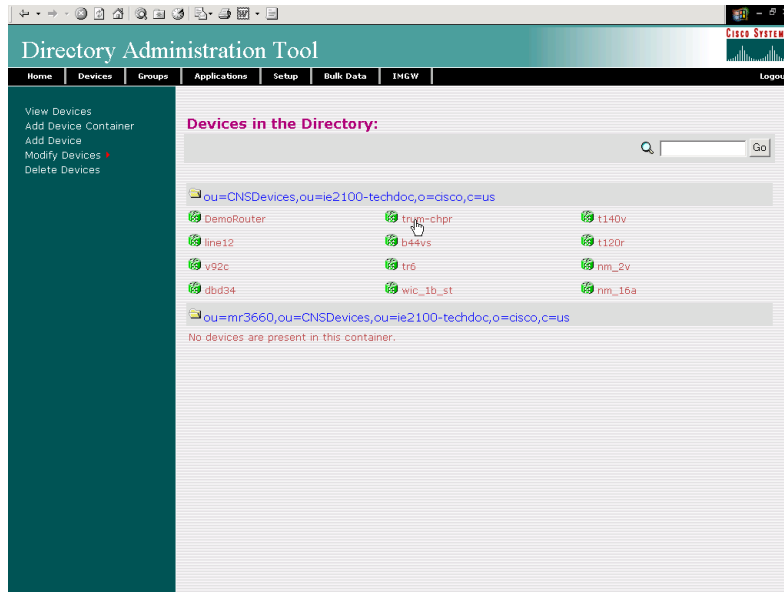


How to View Devices in the System

To view the devices currently in the system, follow these steps:

- Step 1** From the Device Management page, click **View Device**.
The Device List page appears (see [Figure 4-4](#)).

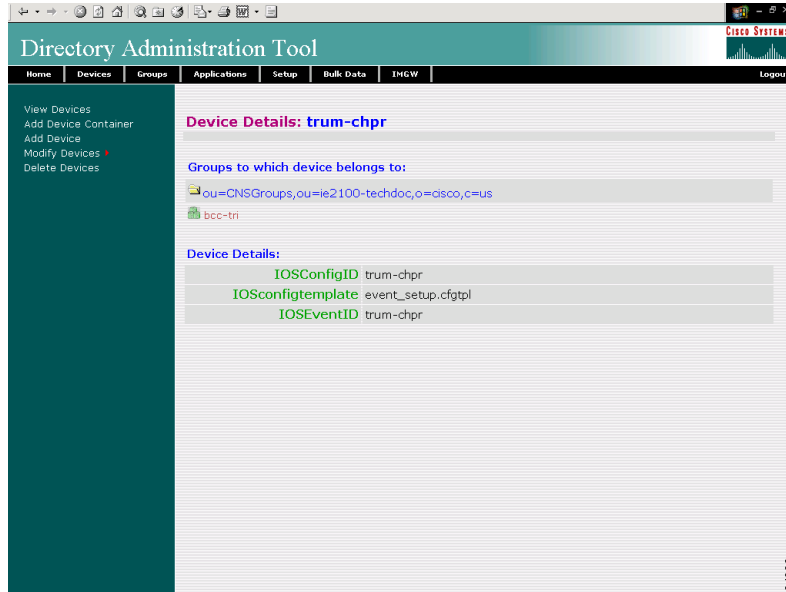
Figure 4-4 Device List



Note Devices with no parent attributes are shown with a dully-shaded icon, so you can easily identify the devices with no groups associated.

- Step 2** Click on the icon for the device configuration you wish to view.
Information about that device appears (see [Figure 4-5](#)).
- Step 3** To return to the main menu, click the **Home** tab.

Figure 4-5 Device Details

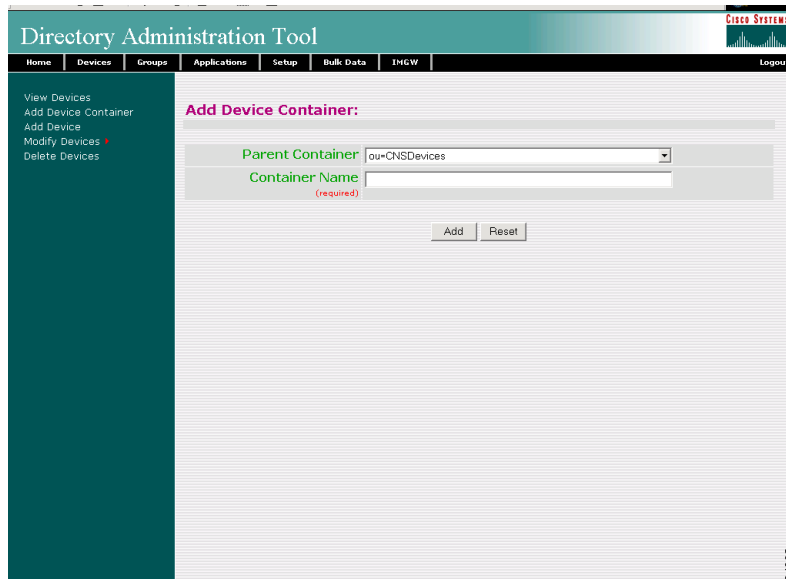


How to Add a Device Container

To add a device container, follow these steps:

- Step 1** From the Device Management page, click **Add Device Container**.
The Add Device Container page appears (Figure 4-6).

Figure 4-6 Add Device Container



Step 2 Select the appropriate Parent Container from the drop-down list.

[Table 4-1](#) lists the valid values for this field.

Table 4-1 Valid Values for Add Device Container

Attribute	Description	Valid Values
Parent Container	Parent container for device objects in the context root.	From drop-down list
Container Name	The name used as ou (organizational unit) of the container.	a-z A-Z 0-9 -(hyphen) _ (under-score) (period)

Step 3 Enter a value in the **Container Name** field.

Step 4 To clear the field and enter a new value, click **Reset**.

Step 5 To add this device container, click **Add**.

Step 6 To return to the main menu, click the **Home** tab.

How to Add a Device

To add a device, follow these steps:

Step 1 From the Device Management page, click **Add Device**.

The Add Device page appears (see [Figure 4-7](#))

Figure 4-7 Add Device

The screenshot shows the 'Add Device' form in the Directory Administration Tool. The form has a left sidebar with navigation links: View Devices, Add Device Container, Add Device, Modify Devices, and Delete Devices. The main content area is titled 'Add Device:' and contains several input fields, each with a '(required)' label in red. The fields are: Device Name, Container (a dropdown menu currently showing 'ou=CNSDevices'), IOSconfigtemplate, IOSConfigID, and IOSEventID. Below these fields is a section titled 'Select groups from below:' which is split into two panes: 'Available Groups' and 'Selected Groups'. The 'Available Groups' pane lists 'bcc-bea', 'bcc-home', 'bcc-tri', and 'default'. There are two arrows between the panes, one pointing from available to selected and one from selected to available. At the bottom of the form are 'Add' and 'Reset' buttons. The Cisco Systems logo is visible in the top right corner of the application window.

Step 2 Enter a value in the **Device Name** field.

Table 4-2 lists valid values for the fields on this page.

Table 4-2 Valid Values for Add Device

Attribute	Description	Valid Values
Device Name	The name used as cn (common name) of the device.	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)
Container	Container for the device object.	From drop-down list
IOSconfigtemplate	Configuration template to associate with the device.	Non-empty String
IOSConfigID	Configuration ID attribute of the device.	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)
IOSEventID	Event ID attribute of the device.	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)

Step 3 Enter a value in the **Device Name** field.

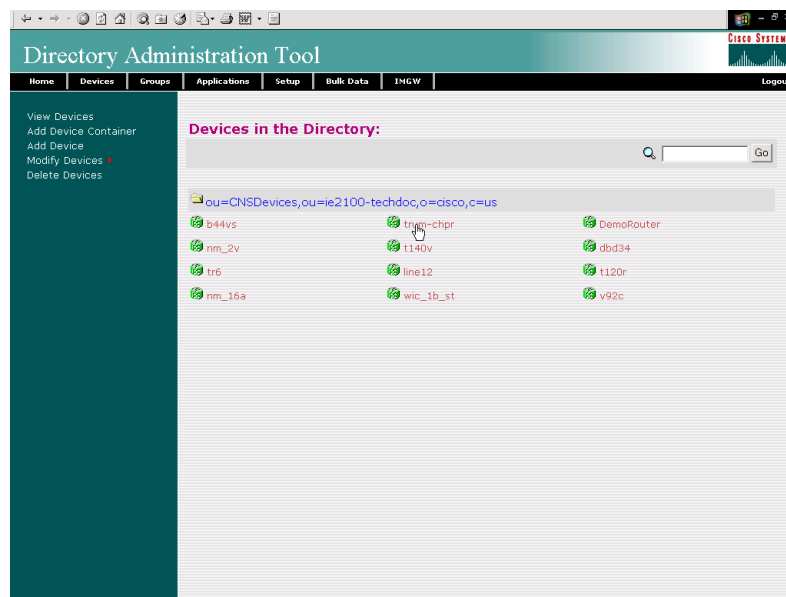
- Step 4** Select a container from the Container pull-down menu.
- Step 5** Enter a template ID for this device in the **IOSConfigtemplate** field.
- Step 6** Enter a value for the unique configuration ID in the **IOSConfigID** field.
- Step 7** Enter a value for the unique event ID in the **IOSEventID** field.
- Step 8** From the **Available Groups** list, select the groups into which this device belongs.
- Step 9** To clear all field and enter new values, click **Reset**.
- Step 10** To add this device to the system, click **Add**.
- Step 11** To return to the main menu, click the **Home** tab.

How to Modify Devices Details

To modify a device details, follow these steps:

- Step 1** From the Device Management page, click **Modify Devices**.
The Devices in the Directory list appears (see [Figure 4-8](#)).

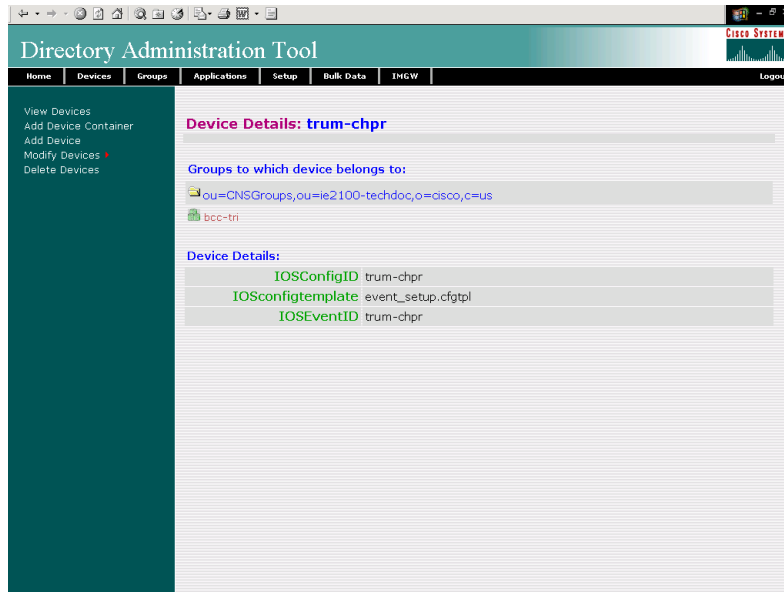
Figure 4-8 Devices in the Directory



Note Devices with no parent attributes are shown with a dully-shaded icon, so you can easily identify the devices with no groups associated.

- Step 2** Click on the icon for the device you wish to modify.
The Device Details page appears (see [Figure 4-9](#))

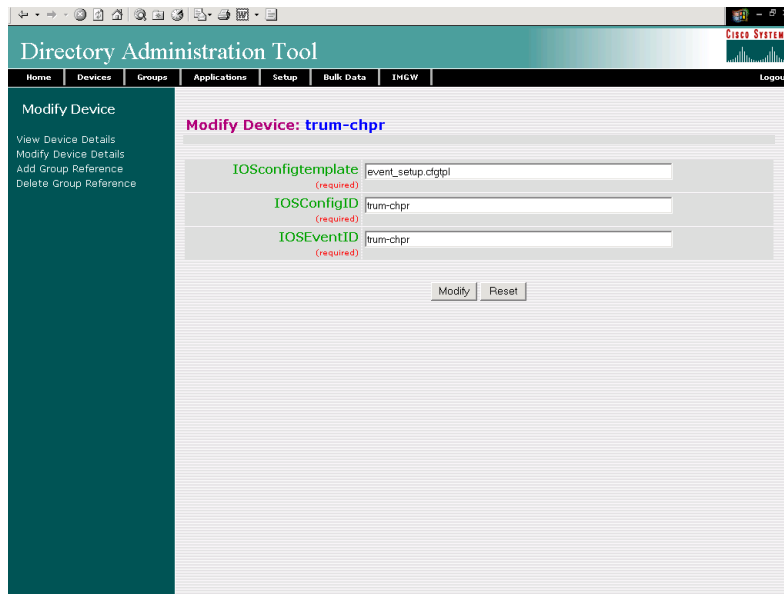
Figure 4-9 Device Details



Step 3 To modify the detail information about this device, in the left side-bar menu, click **Modify Device Details**.

The Modify Device task page appears (see [Figure 4-10](#)).

Figure 4-10 Modify Task



Step 4 Modify all appropriate fields.

[Table 4-3](#) lists valid values for these fields.

Table 4-3 Valid Values for Modify Device

Attribute	Description	Valid Values
IOSconfigtemplate	Configuration template to associate with the device.	Non-empty String
IOSConfigID	Configuration ID attribute of the device.	a-z A-Z 0-9 -(hyphen) _(under-score) (period)
IOSEventID	Event ID attribute of the device.	a-z A-Z 0-9 -(hyphen) _(under-score) (period)

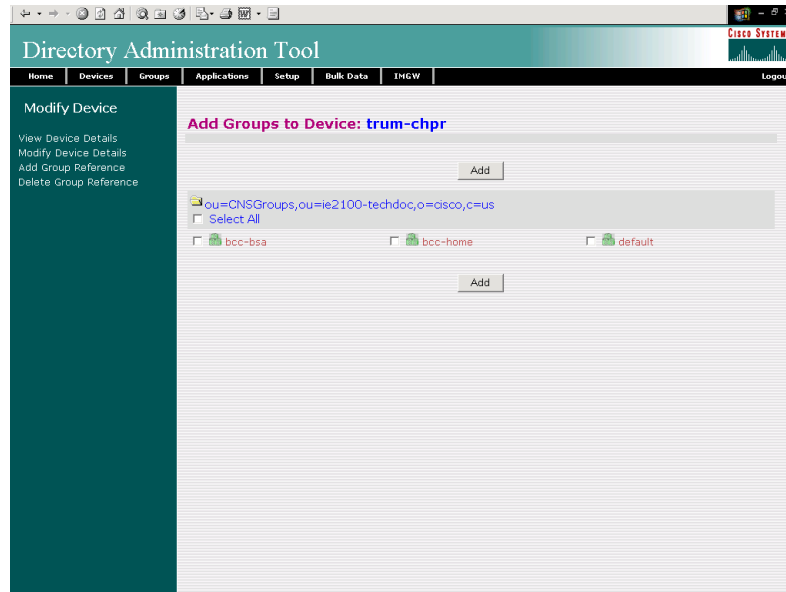
- Step 5** To clear all field and enter new values, click **Reset**.
- Step 6** To apply these changes to this device, click **Apply**.
- Step 7** To return to the main menu, click the **Home** tab.

How to Add Device Group References to a Device

To add groups in which this device is referenced as a member, follow these steps:

- Step 1** From the Modify Device page left side-bar menu, click **Add Group Reference**.
The Group Reference page appears (see [Figure 4-11](#)).

Figure 4-11 Add Groups to Device



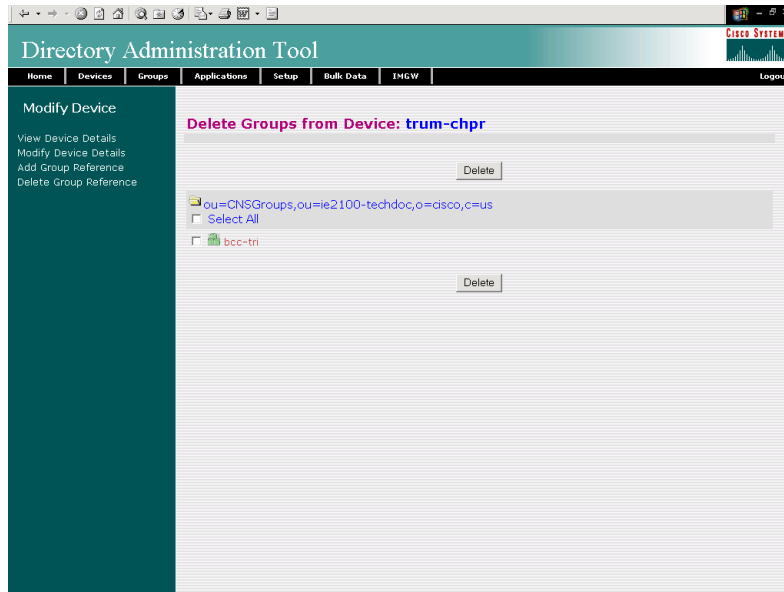
- Step 2** Check the groups in which you want this device to appear.
- Step 3** To apply these changes to this device, click **Add**.
- Step 4** To return to the main menu, click the **Home** tab.

How to Delete Device Group References to a Device

To delete groups in which this device is referenced as a member, follow these steps:

- Step 1** From the Modify Device page left side-bar menu, click **Delete Group Reference**. The Delete Devices from Group page appears (see [Figure 4-12](#)).

Figure 4-12 Delete Devices from Group



- Step 2** Check those group references you want to delete.
- Step 3** To these group references, click **Delete**.
- Step 4** To return to the main menu, click the **Home** tab.

How to Delete Devices

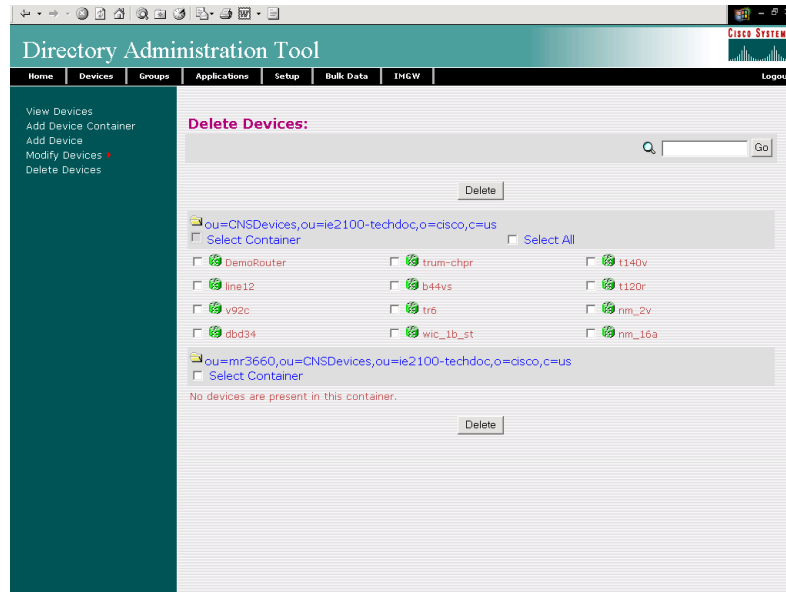
The delete device function relative to groups is different for each type of directory.

For Critical Path, NDS, and iPlanet, if the device is the only member of a group when you delete the device, the group remains in an empty state. However, the device reference is deleted from the group.

To delete devices from the system using DAT, follow these steps:

- Step 1** From the Device Management page, click Delete Devices.
The Delete Devices page appears (see [Figure 4-13](#))

Figure 4-13 Delete Devices



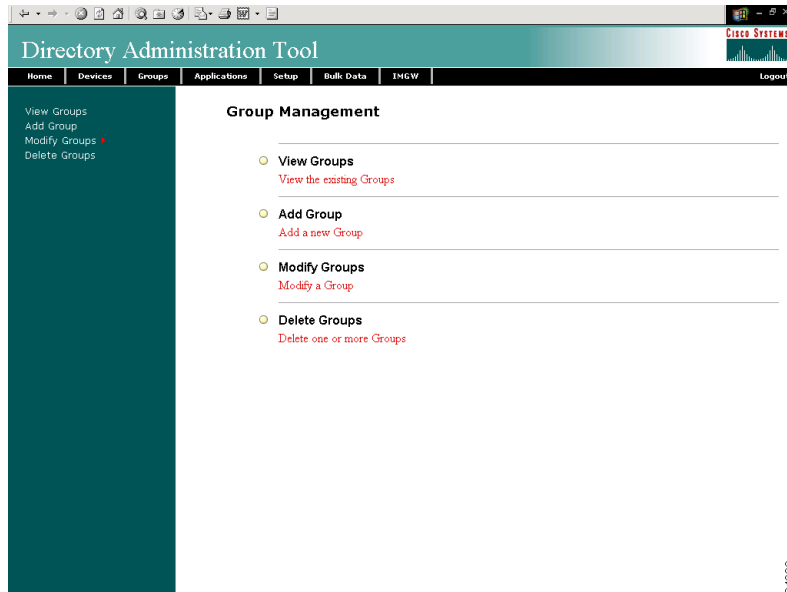
Note Devices with no parent attributes are shown with a dully-shaded icon, so you can easily identify the devices with no groups associated.

- Step 2** Select the devices you want to delete from the system.
- Step 3** To delete this device, click **Delete**.
- Step 4** To return to the main menu, click the **Home** tab.

How to Manage Groups

To manage groups in the system, from the main menu, click the **Groups** tab. The Group Management page appears (see [Figure 4-14](#)).

Figure 4-14 Group Management

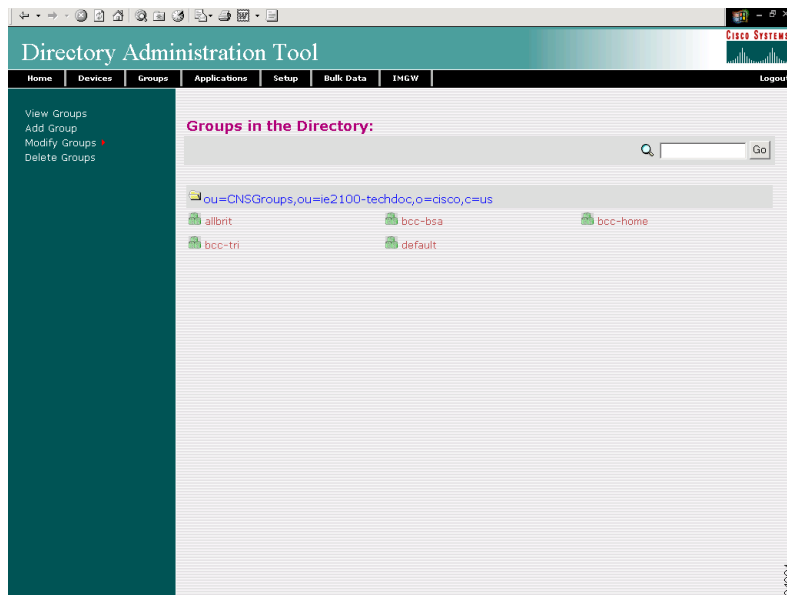


How to View Groups in the System

To view all the groups in the system, follow these steps:

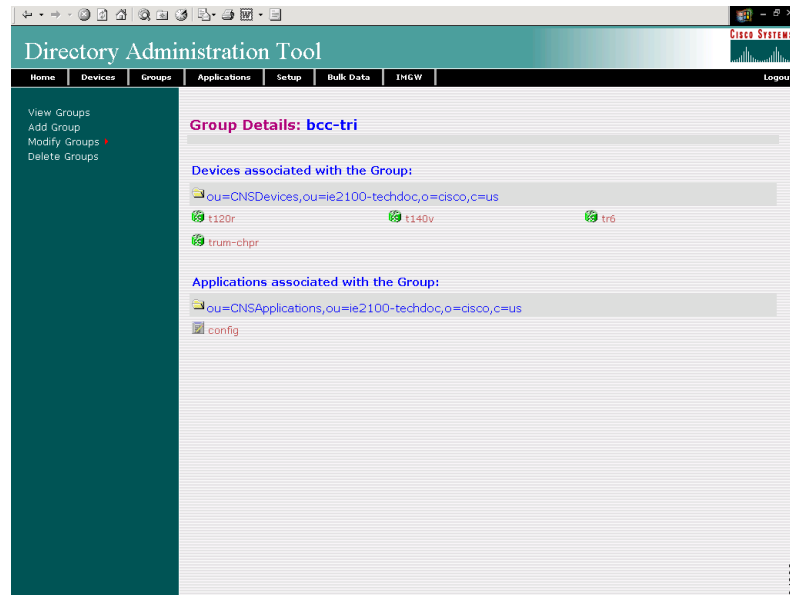
- Step 1** From the Group Management page, click **View Groups**.
The group listing appears (see Figure 4-15).

Figure 4-15 Groups in the System



- Step 2** To view the details of a particular group, click on the icon associated with the group you want to view. The Groups Detail page appears (see [Figure 4-16](#)).

Figure 4-16 Groups Details



- Step 3** To return to the main menu, click the **Home** tab.

How to Add a Group

To add a group, follow these steps:

- Step 1** From the Group Management page, click **Add Group**. The Add Group page appears (see [Figure 4-17](#)).

Figure 4-17 Add Group

Step 2 Enter a value for the group name in the **Group Name** field.

Table 4-4 lists valid values for this field.

Table 4-4 Valid Values for Add Group

Attribute	Description	Valid Values
Group Name	The name used as cn (common name) of the Group.	a-z A-Z 0-9 -(hyphen) _(under-score) (period)

Step 3 From the list of available devices, select the devices you want associated with this group.

Step 4 From the list of available applications, select the applications you want associated with this group.

Step 5 Modify all appropriate fields.

Step 6 To clear all field and enter new values, click **Reset**.

Step 7 To add this group, click **Add**.

Step 8 To return to the main menu, click the **Home** tab.

Modifying Groups

To modify a group, follow these steps:

Step 1 From the Group Management page, click **Modify Group**.

The Group list appears (see [Figure 4-15](#)).

Step 2 Click on the icon associated with the group you want to modify.

The group details appear (see [Figure 4-16](#)).

Step 3 From the left side-bar menu, choose which aspect of the group you want to modify.

Modifying Group Details

Using the user interface to modify group details (attributes) is possible only if you have extended the group objectclass in the directory with extra attributes.

How to Populate a Group Attribute

Before you can populate a group attribute, you must extend the directory schema manually. The Cisco CNS Configuration Engine 1.4 cannot add new attributes to the group objectclass in the directory.

Once you have extended the schema, you can populate the new object class using DAT by following these steps:

Step 1 In the DAT user interface, under **Group Setup**, click on **Add More Attributes to the UI**.

(See “[How to View and Modify Group Setup](#)” section on page 4-38.)

Step 2 Enter the new attributes.

Step 3 Click **Save**.

Now, when you go to **Modify Groups**, you can modify these new attributes under **Modify Group Details**.

How to Modify Group Details

To modify group details, follow these steps:

Step 1 From the Group Management page, click **Modify Groups**.

The group list appears (see [Figure 4-15](#)).

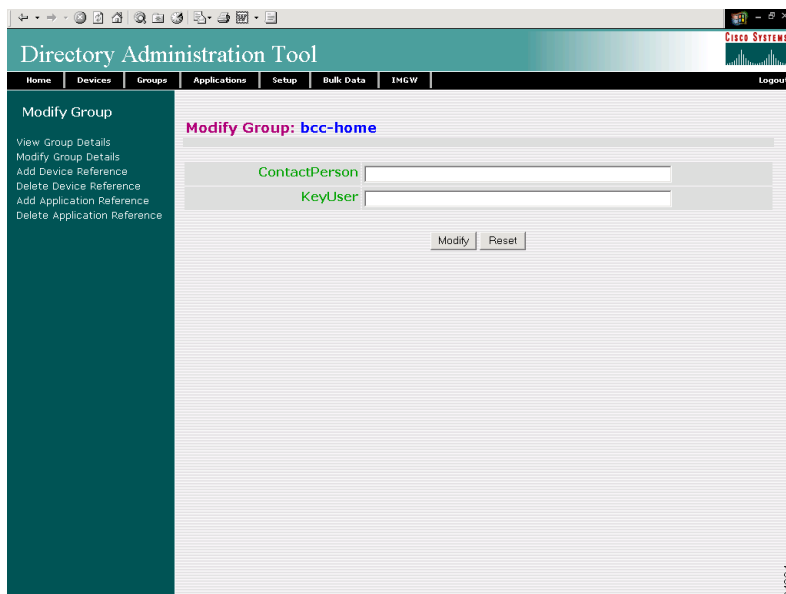
Step 2 Click on the icon associated with the group you want to modify.

The Group Details page appears (see [Figure 4-16](#)).

Step 3 To modify the group attributes, from the left side-bar menu, click on **Modify Group Details**.

The modify attributes task page appears (see [Figure 4-18](#)).

Figure 4-18 Modify Group Details



Step 4 Modify all appropriate attributes.

Table 4-5 lists valid values for these fields.

Table 4-5 Valid Values for Modify Group Details

Attribute	Description	Valid Values
ContactPerson	Name of the primary contact person.	a-z A-Z 0-9 -(hyphen) _(under-score) (period)
KeyUser	Name of the primary contact person.	a-z A-Z 0-9 -(hyphen) _(under-score) (period)

Step 5 To clear all field and enter new values, click **Reset**.

Step 6 To modify this group, click **Modify**.

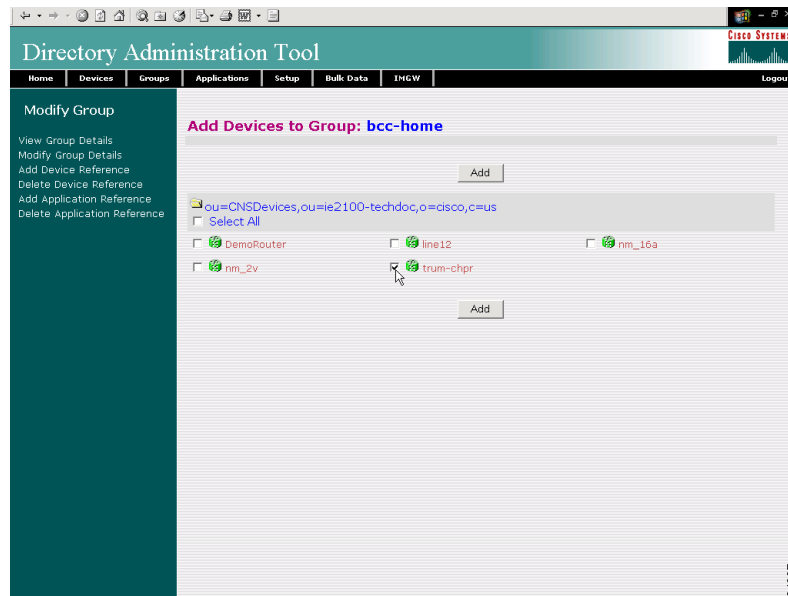
Step 7 To return to the main menu, click the **Home** tab.

How to Add Device References to a Group

To add devices to a group, follow these steps:

- Step 1** From the Group Management page, click **Modify Groups**.
The group list appears (see [Figure 4-15](#)).
- Step 2** Select the group you want to modify by clicking on its icon.
- Step 3** To add devices to this group, from the left side-bar menu, click on **Add Device Reference**.
The device list appears (see [Figure 4-19](#)).

Figure 4-19 Add Devices to Group



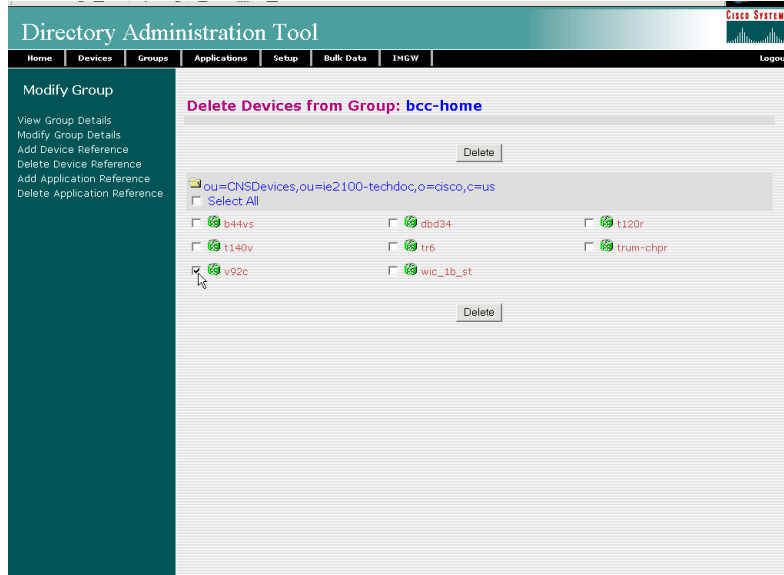
- Step 4** Check all devices you want to appear in this group.
- Step 5** To modify the group with these devices, click **Add**.
- Step 6** To return to the main menu, click the **Home** tab.

How to Delete Devices from a Group

To delete devices to a group, follow these steps:

- Step 1** From the Group Management page, click **Modify Groups**.
The group list appears (see [Figure 4-15](#)).
- Step 2** Select the group you want to modify by clicking on its icon.
The list of devices currently associated with this group appears (see [Figure 4-20](#)).

Figure 4-20 Delete Devices from Group



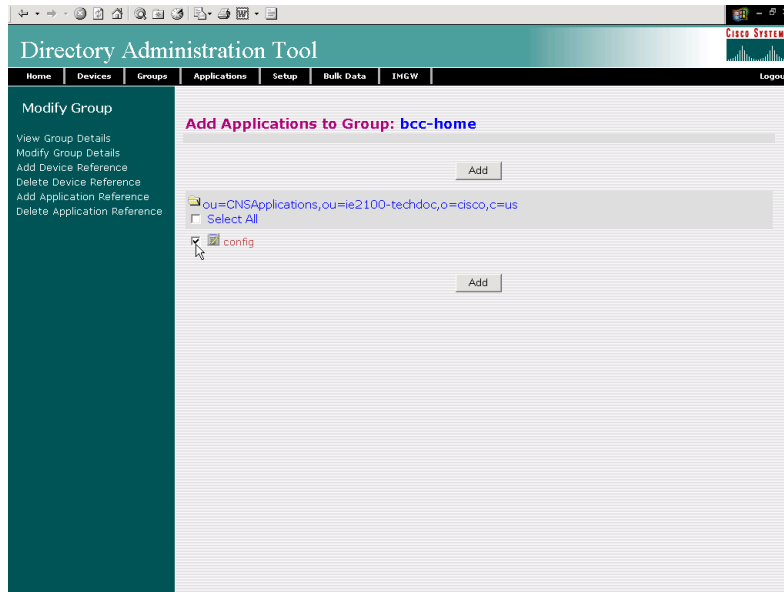
- Step 3** Check all devices you want to delete from this group.
- Step 4** To delete these devices from this group, click **Delete**.
- Step 5** To return to the main menu, click the **Home** tab.

How to Add Applications to a Group

To add applications to a group, follow these steps:

- Step 1** From the Group Management page, click **Modify Groups**.
The group list appears (see [Figure 4-15](#)).
- Step 2** Select the group you want to modify by clicking on its icon.
- Step 3** To add applications to this group, from the left side-bar menu, click on **Add Application Reference**.
A list of applications appears (see [Figure 4-21](#)).

Figure 4-21 Add Applications to Group



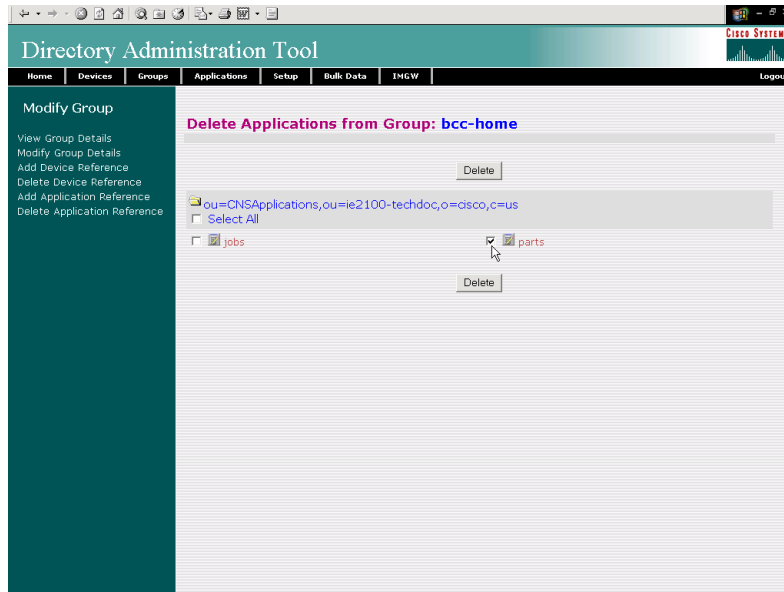
- Step 4** Check the applications you want to add to this group.
- Step 5** To modify the group with these applications, click **Add**.
- Step 6** To return to the main menu, click the **Home** tab.

How to Delete Applications from a Group

To delete applications to a group, follow these steps:

- Step 1** From the Group Management page, click **Modify Groups**.
The group list appears (see [Figure 4-15](#)).
- Step 2** Select the group you want to modify by clicking on its icon.
The list of applications currently associated with this group appears (see [Figure 4-22](#)).

Figure 4-22 Delete Applications from Group



- Step 3** Check the applications you want to delete from this group.
- Step 4** To delete these applications from this group, click **Delete**.
- Step 5** To return to the main menu, click the **Home** tab.

How to Delete Groups

To delete group(s) from the system using DAT, follow these steps:

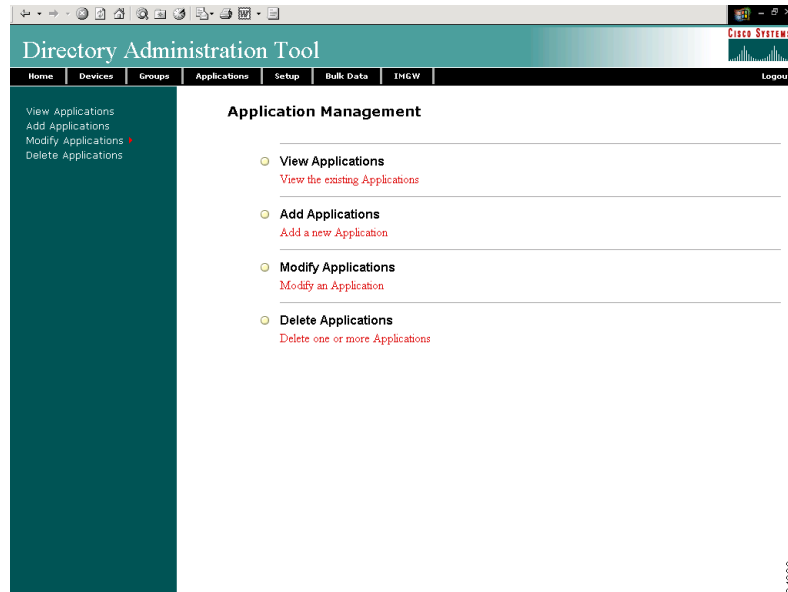
- Step 1** From the Device Management page, click Delete Groups.
The Delete Groups page appears
- Step 2** Select the group(s) you want to delete from the system.
- Step 3** To delete this group(s), click **Delete**.
- Step 4** To return to the main menu, click the **Home** tab.

How to Manage Applications

To view and modify applications, from the main menu, click the **Applications** tab.

The Application Management page appears (see [Figure 4-23](#)).

Figure 4-23 Application Management

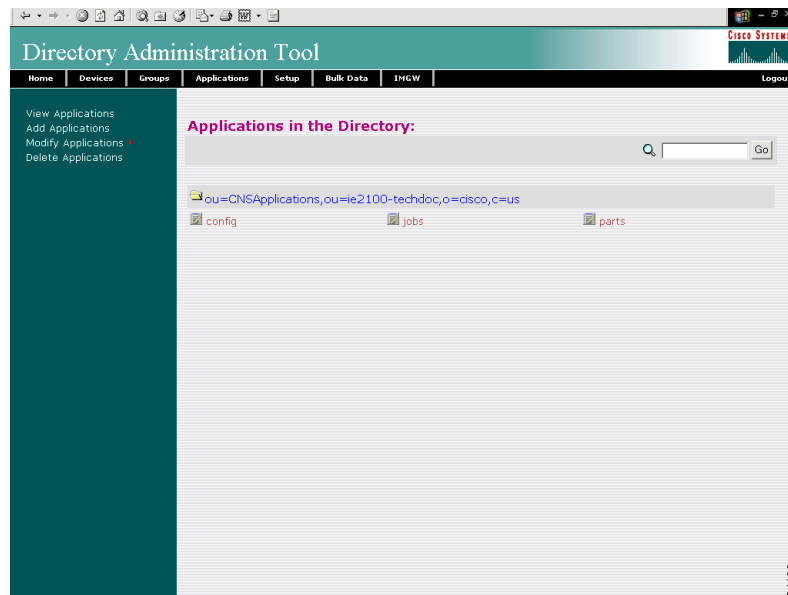


How to View Applications on the System

To view the current list of applications running on the system, follow these steps:

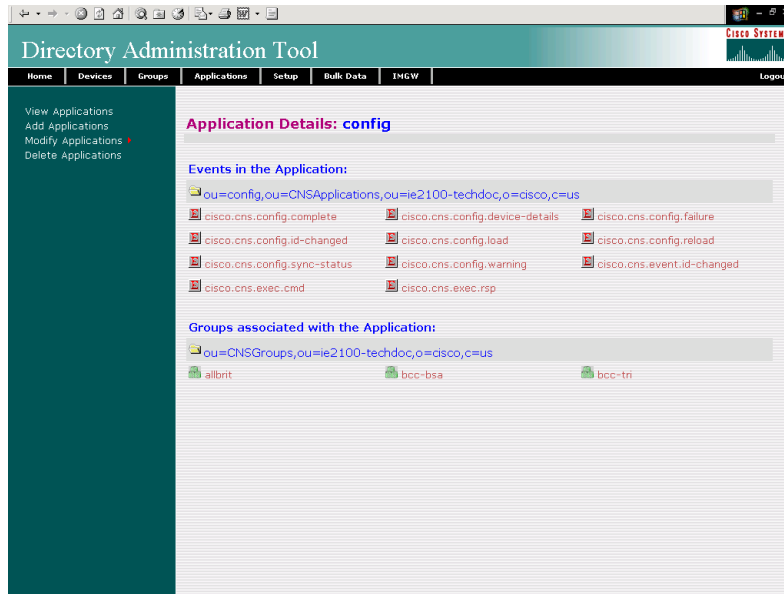
- Step 1** From the Application Management page, click **View Applications**.
The application list appears (see Figure 4-24).

Figure 4-24 Applications List



- Step 2** To view the details of an application, click on the icon associated with application you want to view. The application details appear (see [Figure 4-25](#)) listing the events in the application and group currently associated with this application.

Figure 4-25 Application Details



- Step 3** To return to the main menu, click the **Home** tab.

How to Add Applications

To add an application to the system, follow these steps:

- Step 1** From the Application Management page, click **Add Application**. The Add Application page appears (see [Figure 4-26](#)).

Figure 4-26 Add Applications

Step 2 Enter a value in the **Application Name** field.

Table 4-6 list the valid values for this field.

Table 4-6 Valid Values for Add Application

Attribute	Description	Valid Values
Application Name	The name used as cn (common name) of the Application.	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)

Step 3 From the list of Available Groups, choose the groups with which you want this application associated.

Step 4 To clear your entries and start over, click **Reset**.

Step 5 To add this application to the system, click **Add**.

After adding an application, you get a success message with a link to add events to that application. Clicking the link takes you to the add events screen (see “[How to Add Events to an Application](#)” section on page 4-27).

Step 6 To return to the main menu, click the **Home** tab.

Modifying Applications

To modify an application, follow these steps:

-
- Step 1** From the Application Management page, click **Modify Application**.
The Application list appears (see [Figure 4-24](#)).
 - Step 2** Click on the icon associated with the application you want to modify.
The application details appear (see [Figure 4-25](#)).
 - Step 3** From the left side-bar menu, choose which aspect of the application you want to modify.
-

Modifying Application Details

Using the user interface to modify application details (attributes) is possible only if you have extended the application objectclass in the directory with extra attributes.

How to Populate an Application Attribute

Before you can populate a application attribute, you must extend the directory schema manually. The Cisco CNS Configuration Engine 1.4 cannot add new attributes to the application objectclass in the directory.

Once you have extended the schema, you can populate the new object class using DAT by following these steps:

-
- Step 1** In the DAT user interface, under **Application Setup**, click on **Add More Attributes to the UI**.
(See “[How to View and Modify Application Setup](#)” section on page 4-39.)
 - Step 2** Enter the new attributes.
 - Step 3** Click **Save**.

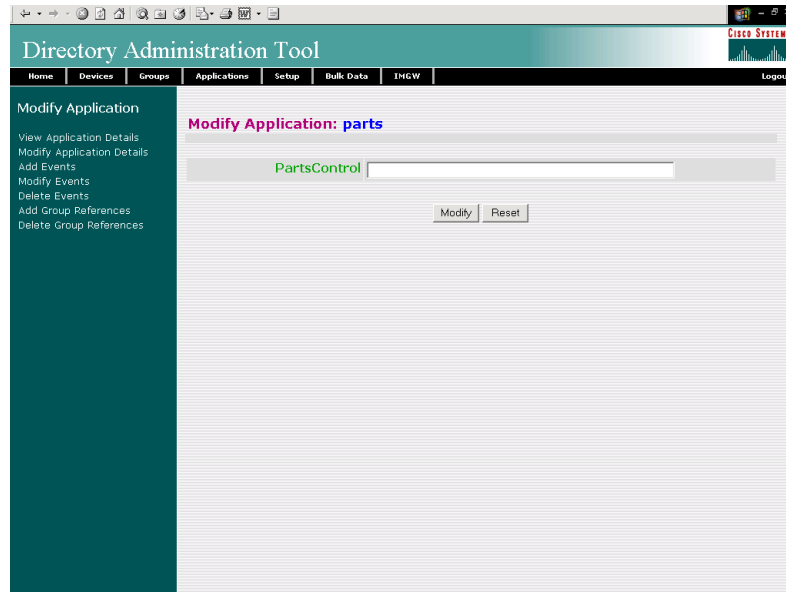
Now, when you go to **Modify Application**, you can modify these new attributes under **Modify Application Details**.

How to Modify Application Details

To modify application details (attributes), follow these steps:

-
- Step 1** From the left side-bar menu, click **Modify Applications Details**.
The modify attributes task page appears.

Figure 4-27 Modify Application Details



Step 2 Modify the application UI attribute as required.



Note The valid values could be anything that is supported by the schema of the directory.

Step 3 To clear all field and enter new values, click **Reset**.

Step 4 To modify this application, click **Modify**.

Step 5 To return to the main menu, click the **Home** tab.

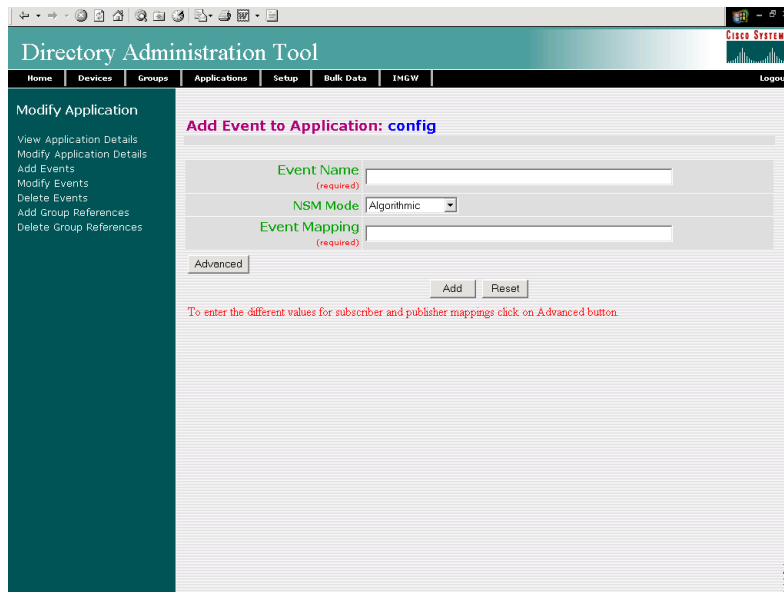
How to Add Events to an Application

To add events to this application, follow these steps:

Step 1 From the left side-bar menu, click **Add Events**.

The Add Events page appears (see [Figure 4-28](#)).

Figure 4-28 Add Events to an Application



Step 2 Enter a value in the **Event Name** field.

Table 4-7 lists valid values for these fields.

All the events that are added in the internal directory for **config** application are as follows:

cisco.mgmt.cns.config.complete

cisco.mgmt.cns.config.failure

cisco.mgmt.cns.config.warning

cisco.mgmt.cns.config.sync-status

cisco.mgmt.cns.config.reboot – deprecated. Use cisco.mgmt.cns.exec.reload instead.

cisco.mgmt.cns.config.load

cisco.mgmt.cns.config.id-changed

cisco.mgmt.cns.config-changed

cisco.mgmt.cns.config-changed.lost

Table 4-7 Valid Values for Event Add

Attribute	Description	Valid Values
Event Name	Name of the event that will be controlled by the selected application.	a-z A-Z 0-9 -(hyphen) _(under-score) (period)

Table 4-7 Valid Values for Event Add

Attribute	Description	Valid Values
NSM Mode	If Algorithmic, specialize the mapping algorithmically, else, the field mapping gives the complete mapping list for a subscriber/publisher.	From drop-down list
Event Mapping	Mapping of the given event to be returned to a subscriber or publisher application.	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)

- Step 3** From the NSM Mode pull down menu, choose a mode.
- Algorithmic — NSM server uses a mapping algorithm
 - Non-algorithmic — NSM server mapping algorithm is overridden by the application
- Step 4** Enter the event mapping in the **Event Mapping** field.
For more information about naming events, see [“NameSpace Mapper” section on page 1-7](#).
- Step 5** To change Subscriber and Publisher parameters from default, click **Advanced**.
The Advanced Event page appears (see [Figure 4-29](#)).

Figure 4-29 Advanced Event Add

The screenshot shows the 'Add Event to Application' page for the application 'config'. The page has a navigation menu on the left with options like 'Modify Application', 'View Application Details', 'Add Events', etc. The main content area is titled 'Add Event to Application: config'. It contains several sections:

- Event Name (required)**: A text input field.
- Subscriber Default**: A dropdown menu set to 'Algorithmic'.
- Publisher Default**: A dropdown menu set to 'Algorithmic'.
- Subscriber Mapping (required)**: A large text area with a 'Remove' button and a 'New Mapping' input with an 'Add to list' button.
- Publisher Mapping (required)**: A large text area with a 'Remove' button and a 'New Mapping' input with an 'Add to list' button.

At the bottom of the form are 'Add' and 'Reset' buttons. The Cisco logo is visible in the top right corner of the page.

- Step 6** Enter a value in the **Event Name** field.
[Table 4-8](#) lists valid values for these fields.

Table 4-8 Valid Values for Advanced Event Add

Attribute	Description	Valid Values
Event Name	Name of the event that will be controlled by the selected application.	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)
Subscriber Default	If Algorithmic, specialize the mapping algorithmically, else, the field mapping gives the complete mapping list for a subscriber/publisher.	From drop-down list
Publisher Default	If Algorithmic, specialize the mapping algorithmically, else, the field mapping gives the complete mapping list for a subscriber/publisher.	From drop-down list
Subscriber Mapping (New Mapping)	Mapping list for subscriber	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)
Publisher Mapping (New Mapping)	Mapping list for publisher	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)

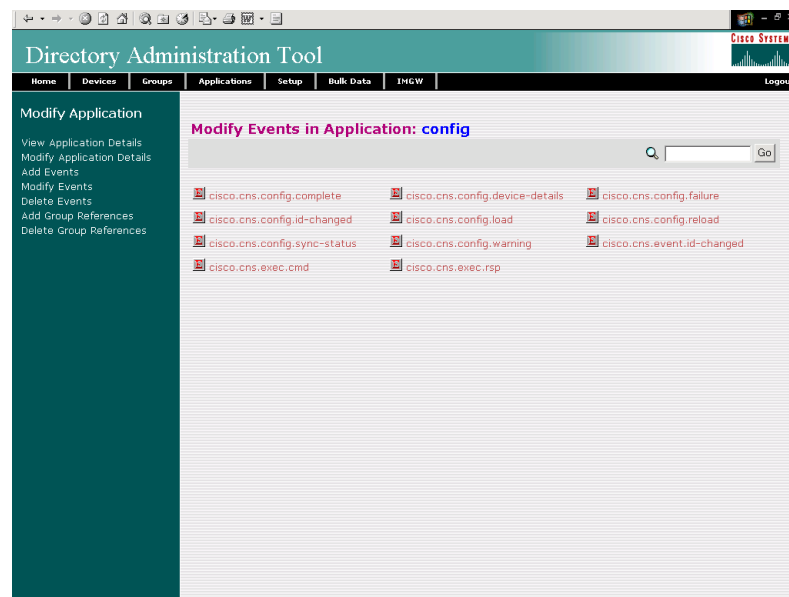
- Step 7** Select the Subscriber Default mode from the pull down menu.
- Step 8** Select the Publisher Default mode from the pull down menu.
- Step 9** To add a new subscriber mapping, enter the subscriber mapping in the **New Mapping** field, the click **Add to list**.
- Step 10** To remove a subscriber mapping, in the **Subscriber Mapping** list, select the desired mapping, then click **Remove**.
- Step 11** To add a new publisher mapping, enter the publisher mapping in the **New Mapping** field, the click **Add to list**.
- Step 12** To remove a publisher mapping, in the **Publisher Mapping** list, select the desired mapping, then click **Remove**.
- Step 13** To add this event to the system, click **Add**.
- Step 14** To clear your entries and start over, click **Reset**.
- Step 15** To return to the main menu, click the **Home** tab.

How to Modify Events in an Application

To modify events to this application, follow these steps:

- Step 1** From the Application Management page, click **Modify Application**.
The application list appears (see [Figure 4-24](#)).
- Step 2** Click on the icon associated with the application for which you want to modify events.
The Application Details page appears (see [Figure 4-25](#)).
- Step 3** From the left side-bar menu, click **Modify Events**.
The events list for this application appears (see [Figure 4-30](#)).

Figure 4-30 *Modify Events in Application*



- Step 4** Click on the icon associated with the event you want to modify.
The Modify Event page appears (see [Figure 4-31](#)).

Figure 4-31 Modify Event

Step 5 Modify all appropriate fields.

Table 4-9 lists valid values for these fields.

Table 4-9 Valid Values for Modify Event

Attribute	Description	Valid Values
Subscriber Default	If Algorithmic, specialize the mapping algorithmically, else, the field mapping gives the complete mapping list for a subscriber/publisher.	From drop-down list
Publisher Default	If Algorithmic, specialize the mapping algorithmically, else, the field mapping gives the complete mapping list for a subscriber/publisher.	From drop-down list
Subscriber Mapping (New Mapping)	Mapping list for subscriber	a-z A-Z 0-9 -(hyphen) _(under-score) (period)
Publisher Mapping (New Mapping)	Mapping list for publisher	a-z A-Z 0-9 -(hyphen) _(under-score) (period)

Step 6 To clear your entries and start over, click **Reset**.

Step 7 To Modify this event, click **Modify**.

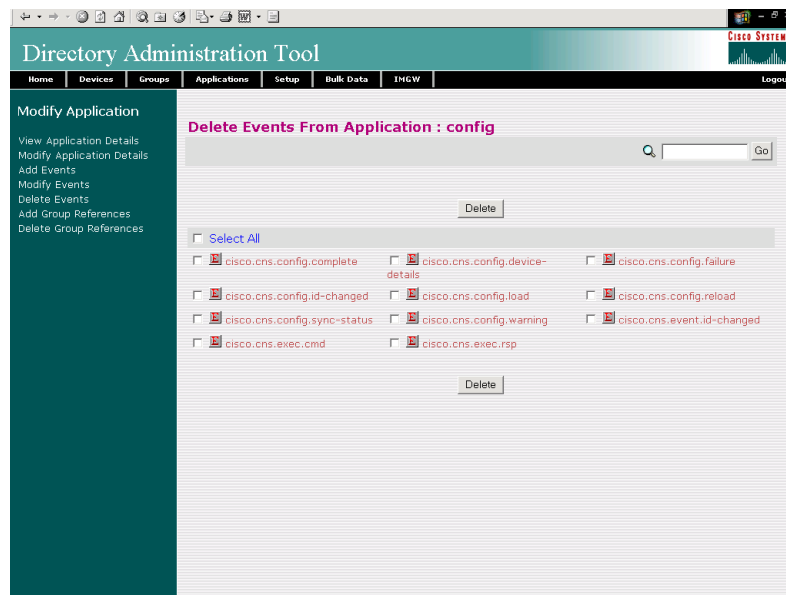
- Step 8** To return to the main menu, click the **Home** tab.

How to Delete Events in a Application

To delete events from an application, follow these steps:

- Step 1** From the Application Management page, click **Modify Application**.
The application list appears (see [Figure 4-24](#)).
- Step 2** Click on the icon associated with the application from which you want to delete events.
The Application Details page appears (see [Figure 4-25](#)).
- Step 3** From the left side-bar menu, click **Delete Events**.
The delete events list for this application appears (see [Figure 4-32](#)).

Figure 4-32 Delete Events from Application



- Step 4** Check all events you want to delete from this application.
- Step 5** To delete these events, click **Delete**.
- Step 6** To return to the main menu, click the **Home** tab.

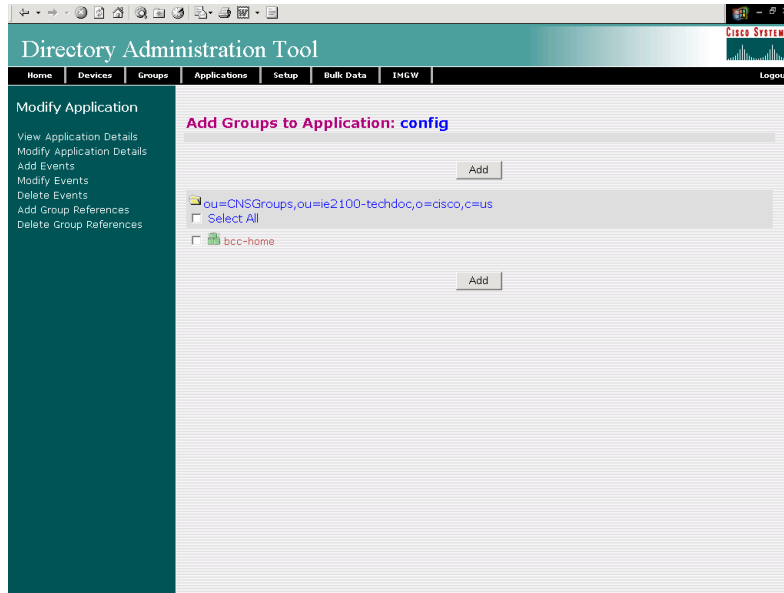
How to Add Group References to an Application

To add group references to an application, follow these steps:

- Step 1** From the Application Management page, click **Modify Application**.
The application list appears (see [Figure 4-24](#)).

- Step 2** Click on the icon associated with the application from which you want to add groups. The Application Details page appears (see [Figure 4-25](#)).
- Step 3** From the left side-bar menu, click **Add Group References**. A list of available groups to add to this application appears (see [Figure 4-33](#)).

Figure 4-33 Add Groups to an Application



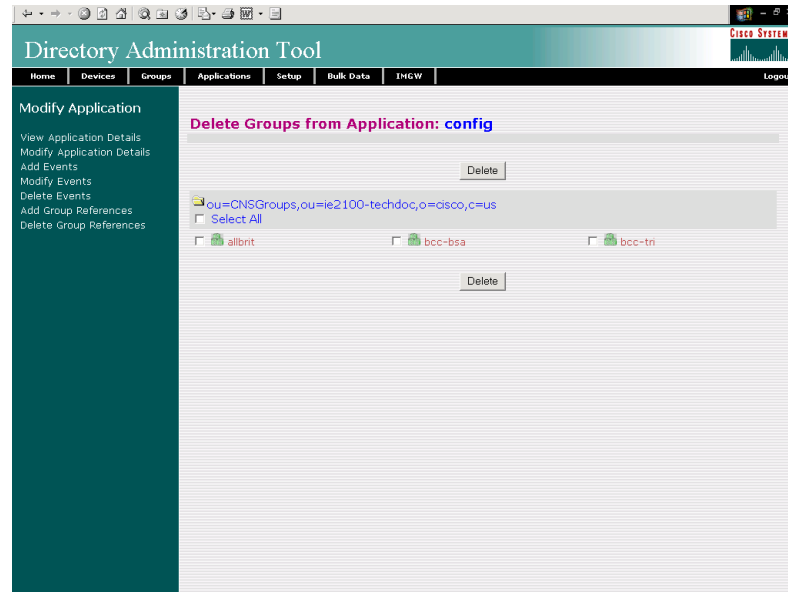
- Step 4** Check all groups you want associated with this application.
- Step 5** To add these group references to this application, click **Add**.
- Step 6** To return to the main menu, click the **Home** tab.

How to Delete Group References from an Application

To delete group references from an application, follow these steps:

- Step 1** From the Application Management page, click **Modify Application**. The application list appears (see [Figure 4-24](#)).
- Step 2** Click on the icon associated with the application from which you want to delete groups. The Application Details page appears (see [Figure 4-25](#)).
- Step 3** From the left side-bar menu, click **Delete Group References**. A list of groups currently associated with this application appears (see [Figure 4-34](#)).

Figure 4-34 Delete Groups from an Application



- Step 4** Check all groups you want to delete from this application.
- Step 5** To delete these groups to this application, click **Delete**.
- Step 6** To return to the main menu, click the **Home** tab.

How to Delete Applications

To delete an application, follow these steps:

- Step 1** From the Application Management page, click **Delete Application**.
The Application list appears (see [Figure 4-24](#)).
- Step 2** Click the icon(s) associated with the application you want to delete.
- Step 3** To delete these applications, click **Delete**.
- Step 4** To return to the main menu, click the **Home** tab.

Managing Directory Setup

When the Cisco CNS Configuration Engine 1.4 is setup, DAT also gets configured with the values as entered by the user during setup. If you have extended the schema, then you have to provide the information about the new attributes (name of the attribute, whether the attribute is mandatory or not, and whether the attribute is single-valued or multi-valued).

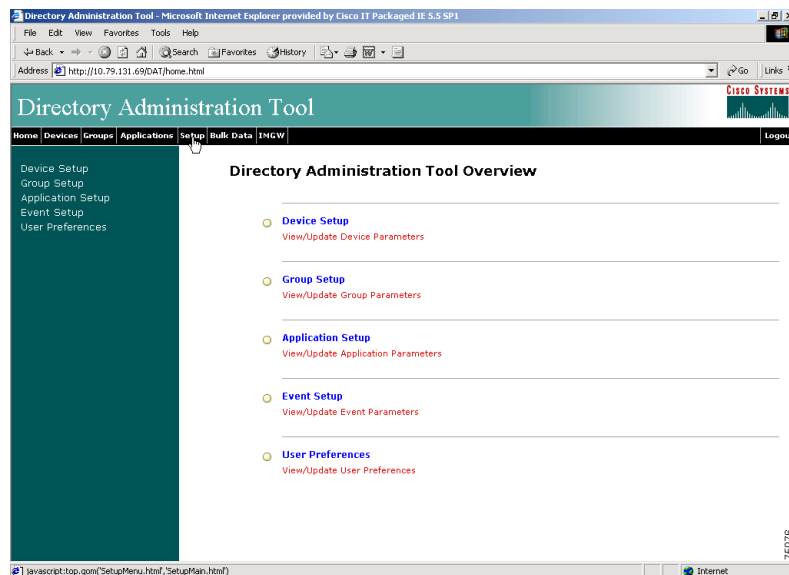
**Note**

Adding attributes in setup does not add these attributes to the directory. These attributes are written only to the DAT property files.

There are some attributes related to directories that get default values during initial setup of the system. You may need to change some of these attributes to match your specific values.

From the DAT main menu, click the Setup tag. The Setup page appears (see [Figure 4-35](#)).

Figure 4-35 Setup Page



How to View and Modify Device Setup

To view and modify device setup, follow these steps:

- Step 1** From the Setup main menu, choose, **Device Setup**.
The Device Setup page appears (see [Figure 4-36](#)).

Figure 4-36 View and Modify Device Setup



Step 2 To modify device setup, change all appropriate fields.

With this page, you can add new attributes that you intend to populate through DAT. The names of the other attributes; template, uniqueconfigid, uniquedeviceid, Parent (device-group association) are also listed in this page. These values are the same as entered during the Cisco CNS Configuration Engine 1.4 setup. These attributes are made mandatory. To change any of these values, the Cisco CNS Configuration Engine 1.4 setup has to be run again. These are the attributes that DAT recognizes initially. If you want more attributes to be managed by DAT, you can add those attribute details on this page.

Step 3 To add more attributes, click **Add More Attributes to the UI**.

Here you can add more attributes to the Device objectClass. You can add new attributes to a Device by giving the attribute name and whether it is mandatory, multi valued.



Note Adding attributes in setup does not add these attributes to the directory. These attributes are written only to the DAT property files. Before you can use the DAT UI to populate a newly added attribute, directory schema must have been extended with that new attribute.

Step 4 To reset this device setup to default values, click **Reset to Default**.

This restores the Cisco CNS Configuration Engine 1.4 settings for only device setup.

Step 5 To save your changes, click **Save**.

Step 6 To cancel this task, click **Cancel**.

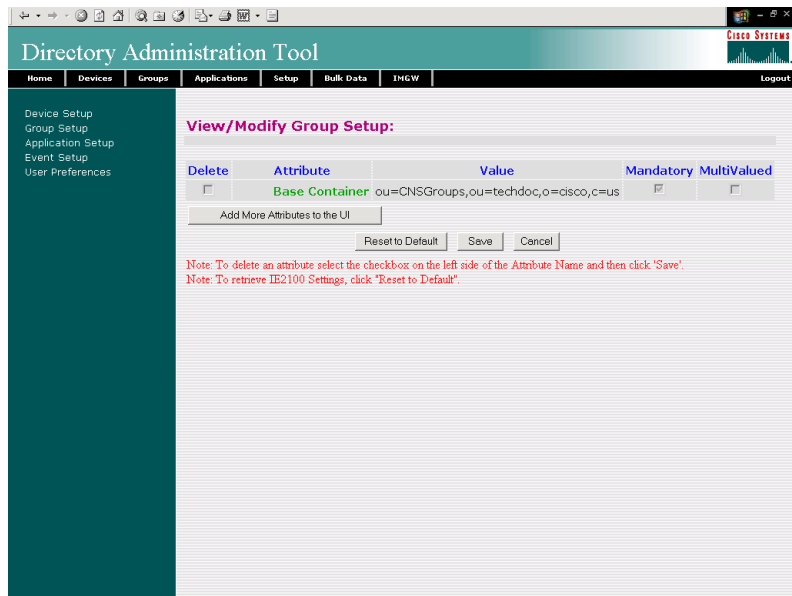
Step 7 To return to the main menu, click the **Home** tab.

How to View and Modify Group Setup

To view and modify group setup, follow these steps:

- Step 1** From the Setup main menu, choose, **Group Setup**.
The Group Setup page appears (see [Figure 4-37](#)).

Figure 4-37 View and Modify Group Setup



- Step 2** To add more attributes, click **Add More Attributes to the UI**.

Here you can add new attributes to the group objectClass; for example, you might be interested in designating a contact person for each of the groups. This can be done by adding an attribute to the group object class in the directory. You can add new attributes to a group by giving the attribute name and whether it is mandatory, or multi valued.



Note Adding attributes in setup does not add these attributes to the directory. These attributes are written only to the DAT property files. Before you can use the DAT UI to populate a newly added attribute, directory schema must have been extended with that new attribute.

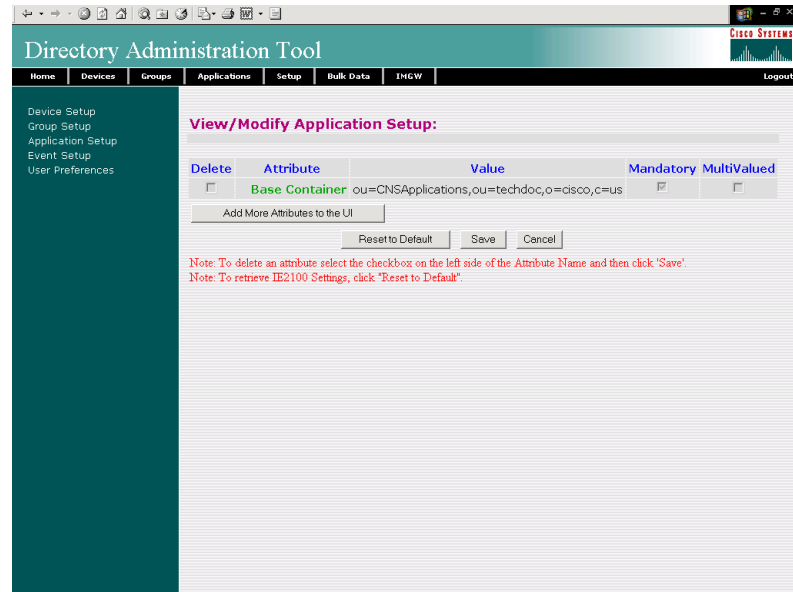
- Step 3** To reset this group setup to default values, click **Reset to Default**.
This restores the Cisco CNS Configuration Engine 1.4 settings for only group setup.
- Step 4** To save your changes, click **Save**.
- Step 5** To cancel this task, click **Cancel**.
- Step 6** To return to the main menu, click the **Home** tab.

How to View and Modify Application Setup

To view and modify application setup, follow these steps:

- Step 1** From the Setup main menu, choose, **Application Setup**.
The Application Setup page appears (see [Figure 4-38](#)).

Figure 4-38 View and Modify Application Setup



- Step 2** Click **Save**.
Step 3 To add more attributes, click **Add More Attributes to the UI**.

Here you can add more attributes to the application objectClass; for example, you might be interested in designating a contact person for each of the applications. This can be done by adding an attribute to the application object class in the directory. You can add new attributes to applications by giving the attribute name and whether it is mandatory, or multi valued.



Note Adding attributes in setup does not add these attributes to the directory. These attributes are written only to the DAT property files. Before you can use the DAT UI to populate a newly added attribute, directory schema must have been extended with that new attribute.

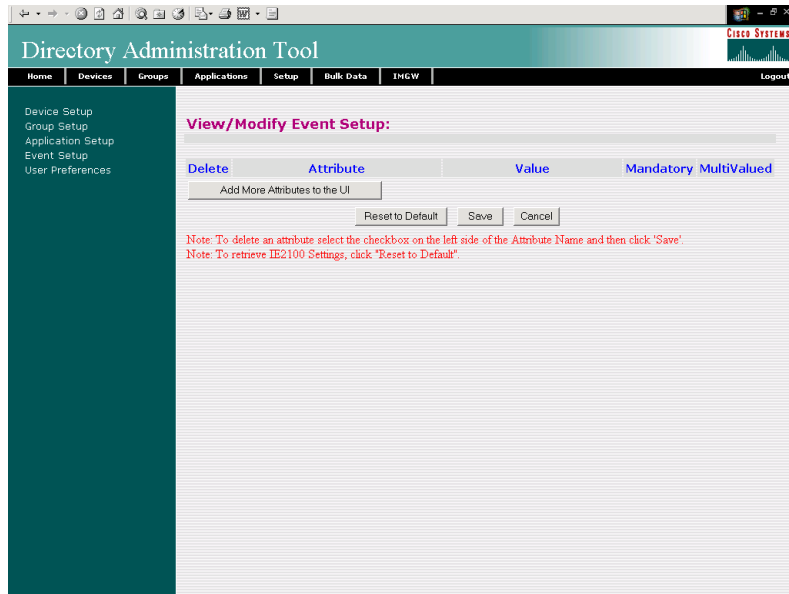
- Step 4** To reset this application setup to default values, click **Reset to Default**.
This restores the Cisco CNS Configuration Engine 1.4 settings for only application setup.
Step 5 To save your changes, click **Save**.
Step 6 To cancel this task, click **Cancel**.
Step 7 To return to the main menu, click the **Home** tab.

How to View and Modify Event Setup

To view and modify Event setup, follow these steps:

- Step 1** From the Setup main menu, choose, **Event Setup**.
The Event Setup page appears (see [Figure 4-39](#)).

Figure 4-39 View and Modify Event Setup



- Step 2** To modify event setup, change all appropriate fields.
If you use the default NSM schema, you will notice that there are no fields to be modified here. This is because there are no attributes required for the event object class. However if you have extended the schema and added some extra attributes to the event object class then you can modify those attributes by changing the name of the attribute in the **Value** text box and updating the Mandatory and MultiValued check boxes.

- Step 3** To add more attributes, click **Add More Attributes to the UI**.
Here you can add more attributes to the event objectClass; for example, you might be interested in adding an extra event to the object class. This can be done by adding an attribute to the event object class in the directory. You can add new attributes to events by giving the attribute name and whether it is mandatory, or multi valued.



Note Adding attributes in setup does not add these attributes to the directory. These attributes are written only to the DAT property files. Before you can use the DAT UI to populate a newly added attribute, directory schema must have been extended with that new attribute.

- Step 4** To save your changes, click **Save**.
- Step 5** To cancel this task, click **Cancel**.

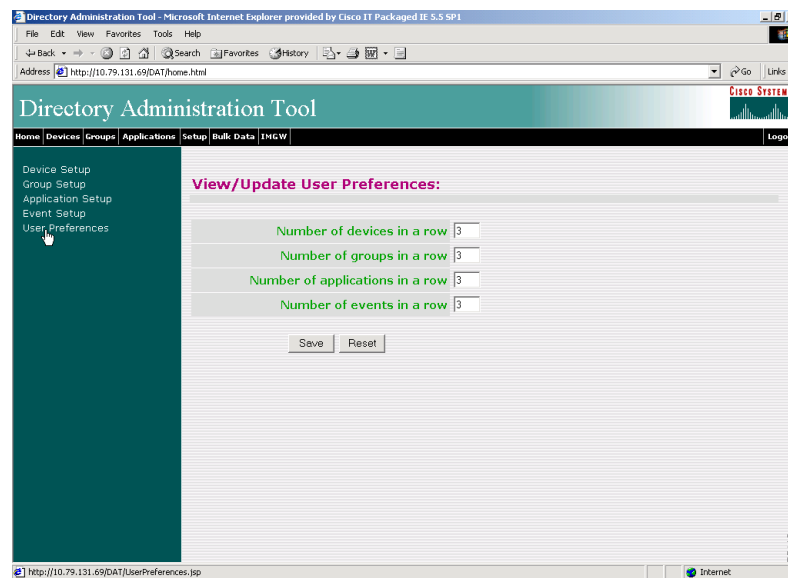
Step 6 To return to the main menu, click the **Home** tab.

How to View and Modify User Preferences

To view and modify user preferences, follow these steps:

Step 1 From the Setup main menu, choose, **User Preferences**.
The User Preferences page appears (see [Figure 4-40](#)).

Figure 4-40 View and Modify User Preferences



Step 2 To modify user preferences, change all appropriate fields.

This consists of the following options:

- Number of devices in a row
- Number of groups in a row
- Number of applications in a row
- Number of events in a row.

These options can be changed by changing the value in the text box.

Step 3 To save your changes, click **Save**.

Step 4 To cancel this task, click **Cancel**.

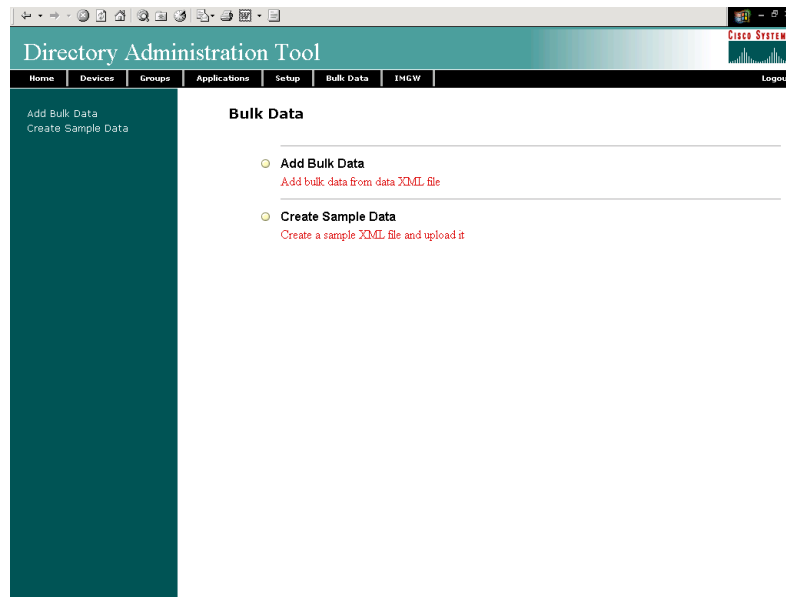
Step 5 To return to the main menu, click the **Home** tab.

How to Manage Bulk Data

To manage bulk data loads, from the main menu, click the **Bulk Data** tab.

The Bulk Data main menu appears (see [Figure 4-41](#)).

Figure 4-41 Bulk Data



XML DTD

The following example shows the Document Type Definition (DTD) for the XML bulk upload:

```
<?xml version="1.0" encoding="utf-8"?>
<!ELEMENT cns-bulk-upload (cns-element-data)>
<!ATTLIST cns-bulk-upload
  stop-on-error (true | false) "false"
>
<!ELEMENT cns-element-data ( NSM-DATA | IMGW-DATA | IMAGE-DATA)>
<!ELEMENT IMGW-DATA (imgw-device*)>
<!ATTLIST IMGW-DATA
  op-type (add) #REQUIRED
>
<!ELEMENT imgw-device (device-id, gateway-id?, device-type, hop-information*)>
<!ELEMENT device-id (#PCDATA)>
<!ELEMENT gateway-id (#PCDATA)>
<!ELEMENT device-type (#PCDATA)>
<!ELEMENT hop-information (hop-type, ip-address?, port?, username?, password?)>
<!ELEMENT hop-type (#PCDATA)>
<!ELEMENT ip-address (#PCDATA)>
<!ELEMENT port (#PCDATA)>
<!ELEMENT username (#PCDATA)>
<!ELEMENT password (#PCDATA)>
<!ELEMENT NSM-DATA (cns-device-container*, cns-device-info*, cns-application-info*,
cns-group-info*)>
<!ATTLIST NSM-DATA
  op-type (add) #REQUIRED
```

```

    validate-data (true | false) #REQUIRED
  >
  <!ELEMENT cns-device-container (device-container-name+, parent-container?)>
  <!-- This tag is to add the sub containers for devices-->
  <!ELEMENT device-container-name (#PCDATA)>
  <!ELEMENT parent-container (#PCDATA)>
  <!-- This is an optional tag that specifies which container the dev. container object is
  to be added-->
  <!ELEMENT cns-device-info (cns-device-name, cns-extended-attr*, device-container?,
  dev-image-information?)>
  <!ELEMENT device-container (#PCDATA)>
  <!-- This is an optional tag that specifies which container this object is to be added-->
  <!ELEMENT cns-device-name (#PCDATA)>
  <!ELEMENT cns-extended-attr (#PCDATA)>
  <!ELEMENT dev-image-information (image-id, activation-template?, dev-image-info+)>
  <!ELEMENT image-id (#PCDATA)>
  <!ELEMENT activation-template (#PCDATA)>
  <!ELEMENT dev-image-info (image-name, distribution)>
  <!ELEMENT image-name (#PCDATA)>
  <!ELEMENT distribution ( destination?, location)>
  <!ATTLIST distribution
    overwrite (yes | no) "no"
    erase-flash (yes | no) "no"
    activate (true | false) "false"
  >
  <!ELEMENT destination (#PCDATA)>
  <!ELEMENT location (#PCDATA)>
  <!ELEMENT cns-application-info (cns-application-name, cns-subject-mapping*,
  application-container?)>
  <!ELEMENT application-container (#PCDATA)>
  <!-- This is an optional tag that specifies which container this object is to be added-->
  <!ELEMENT cns-application-name (#PCDATA)>
  <!ELEMENT cns-subject-mapping (cns-original-subject, cns-pub-mapping*, cns-sub-mapping*,
  cns-pub-default, cns-sub-default, cns-extended-attr*)>
  <!ELEMENT cns-original-subject (#PCDATA)>
  <!ELEMENT cns-pub-mapping (#PCDATA)>
  <!ELEMENT cns-sub-mapping (#PCDATA)>
  <!ELEMENT cns-pub-default (#PCDATA)>
  <!ELEMENT cns-sub-default (#PCDATA)>
  <!ELEMENT cns-group-info (cns-group-name, cns-group-application-name*, cns-group-member*,
  cns-extended-attr*, group-container?)>
  <!ELEMENT group-container (#PCDATA)>
  <!-- This is an optional tag that specifies which container this object is to be added-->
  <!ELEMENT cns-group-name (#PCDATA)>
  <!ELEMENT cns-group-application-name (#PCDATA)>
  <!ELEMENT cns-group-member (#PCDATA)>
  <!ATTLIST cns-group-application-name
    application-container CDATA #IMPLIED
  >
  <!ATTLIST cns-group-member
    device-container CDATA #IMPLIED
  >
  <!ATTLIST cns-extended-attr
    name CDATA #REQUIRED
  >
  <!-- Here starts the definition for Image-data-->
  <!ELEMENT IMAGE-DATA (image+)>
  <!ATTLIST IMAGE-DATA
    op-type (add) #REQUIRED
  >
  <!ELEMENT image (name, image-info)>
  <!ELEMENT name (#PCDATA)>
  <!ELEMENT image-info (img-name, img-chksum?, hdr-chksum?, software-version?,
  system-description?, file-byte-size?, platform-family-name?, img-location*)>

```

```

<!ATTLIST image-info
      image-type (IOS | pix-image | pdm | other) "IOS"
>
<!ELEMENT img-name (#PCDATA)>
<!ELEMENT img-chksum (#PCDATA)>
<!ELEMENT hdr-chksum (#PCDATA)>
<!ELEMENT file-byte-size (#PCDATA)>
<!ELEMENT system-description (#PCDATA)>
<!ELEMENT platform-family-name (#PCDATA)>
<!ELEMENT software-version (#PCDATA)>
<!ELEMENT img-location (#PCDATA)>

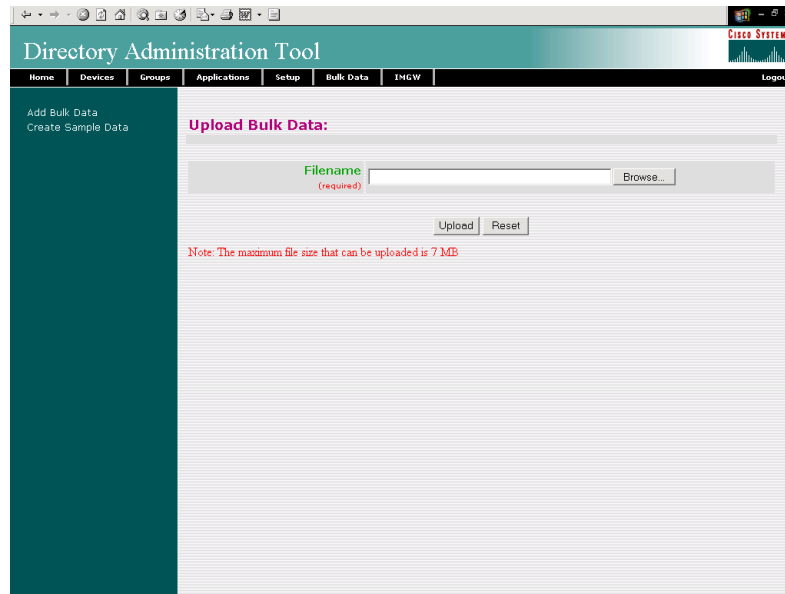
```

How to Upload Bulk Data

To upload bulk data to your system, follow these steps:

- Step 1** From the Bulk Data main menu, click **Add Bulk Data**.
The Upload Bulk Data page appears (see [Figure 4-42](#)).

Figure 4-42 Upload Bulk Data



- Step 2** If you know the filename of the data file you want to load, enter it in the **Filename** field, otherwise use the browse function.

[Table 4-10](#) lists the valid values for this field.

Table 4-10 Valid Values for Upload Bulk Data

Attribute	Description	Valid Values
Filename	Name of the file containing the data to be uploaded.	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)

- Step 3** To use the browser to locate the filename of the data file you want to upload, click **Browse**.
- Step 4** To clear your entry and start over, click **Reset**.
- Step 5** To initiate the upload, click **Upload**.
- Step 6** To return to the main menu, click the **Home** tab.

Command-Line Upload of Bulk Data

You can also upload the XML file to the directory using a command line utility as follows:

- Step 1** FTP the bulk upload XML file to the `/opt/CSCODat/scripts/` directory on the CNS 2100 Series system.
- Step 2** Login to the box using Telnet
- Step 3** Go to: `/opt/CSCODat/scripts/`
- Step 4** Run the following command to invoke the bulk upload command line utility:

```
./upload.sh <xml filename>
```

For example: `./upload.sh my_bulk_data.xml`

This uploads the data to the LDAP directory.

Creating Sample Data for Bulk Upload

Even though the DTD (see “XML DTD” section on page 4-42) outlines the structure of the input XML file, it does not convey the information about what values should be given for each tag. By looking at the sample data files (NSM and IMGW) in this section, you can get an idea of how the data should be arranged in the Bulk Upload XML file.

You can create sample data files for both NSM and IMGW devices.

How to Create Sample Data for Bulk Upload

To create sample data on your system, follow these steps:

Step 1 From the Bulk Data main menu, click **Add Bulk Data**.

The Upload Bulk Data page appears (see [Figure 4-43](#)).

Figure 4-43 Create Sample Data

Create Sample Data:

Prefix (required)

Sample NSM Data Without image info
 With image info

Sample IMGW Data

Sample IMAGE Data

OK

Note: All device/group/application names in the sample data file will start with the prefix entered above.

Step 2 Enter the prefix name for this sample in the **Prefix** field.

[Table 4-11](#) lists valid values for these fields.

Table 4-11 Valid Values for Create Sample Data

Attribute	Description	Valid Values
Prefix	Prefix that is used to create the device/application/group objects.	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)
Sample NSM Data Without image info	Creates application, group, CNS device data without the image information for CNS device.	Radio button
Sample NSM Data With image info	Creates application, group, CNS device data without the image information for CNS device. Also creates IMAGE object data.	Radio button
Sample IMGW Data	Creates IMGW device object data	Radio button
Sample IMAGE Data	Creates IMAGE object data	Radio button

Step 3 Select whether this is for NSM, IMGW, or IMAGE data.

Step 4 To create this sample, click **OK**.

Step 5 To return to the main menu, click the **Home** tab.

NSM Data Sample

The following example shows an NSM data sample for bulk upload:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cns-bulk-upload SYSTEM "BulkUpload.dtd">
<cns-bulk-upload stop-on-error="false">
  <cns-element-data>
    <NSM-DATA op-type="add" validate-data="false">
      <cns-device-container>
        <device-container-name>SampleSubDevices</device-container-name>
      </cns-device-container>
      <cns-device-container>
        <device-container-name>SubSubDevices</device-container-name>

<parent-container>ou=SampleSubDevices,ou=CNSDevices,ou=cns-pokhran4,o=infy,c=in</parent-co
ntainer>

      </cns-device-container>
      <cns-device-info>
        <cns-device-name>SampleDevice1</cns-device-name>
        <cns-extended-attr
name="IOSconfigtemplate">DemoRouter.cfgtpl</cns-extended-attr>
        <cns-extended-attr name="IOSConfigID">SampleDevice1</cns-extended-attr>
        <cns-extended-attr name="IOSEventID">SampleDevice1</cns-extended-attr>
      </cns-device-info>
      <cns-device-info>
        <cns-device-name>SampleDevice2</cns-device-name>
        <cns-extended-attr
name="IOSconfigtemplate">DemoRouter.cfgtpl</cns-extended-attr>
        <cns-extended-attr name="IOSConfigID">SampleDevice2</cns-extended-attr>
        <cns-extended-attr name="IOSEventID">SampleDevice2</cns-extended-attr>
      </cns-device-info>
      <cns-device-info>
        <cns-device-name>SampleDevice3</cns-device-name>
        <cns-extended-attr
name="IOSconfigtemplate">DemoRouter.cfgtpl</cns-extended-attr>
        <cns-extended-attr name="IOSConfigID">SampleDevice3</cns-extended-attr>
        <cns-extended-attr name="IOSEventID">SampleDevice3</cns-extended-attr>
      </cns-device-info>
      <cns-device-info>
        <cns-device-name>SampleDevice4</cns-device-name>
        <cns-extended-attr
name="IOSconfigtemplate">DemoRouter.cfgtpl</cns-extended-attr>
        <cns-extended-attr name="IOSConfigID">SampleDevice4</cns-extended-attr>
        <cns-extended-attr name="IOSEventID">SampleDevice4</cns-extended-attr>

<device-container>ou=SampleSubDevices,ou=CNSDevices,ou=cns-pokhran4,o=infy,c=in</device-co
ntainer>

      </cns-device-info>
      <cns-device-info>
        <cns-device-name>SampleDevice5</cns-device-name>
        <cns-extended-attr
name="IOSconfigtemplate">DemoRouter.cfgtpl</cns-extended-attr>
        <cns-extended-attr name="IOSConfigID">SampleDevice5</cns-extended-attr>
        <cns-extended-attr name="IOSEventID">SampleDevice5</cns-extended-attr>

<device-container>ou=SubSubDevices,ou=SampleSubDevices,ou=CNSDevices,ou=cns-pokhran4,o=inf
y,c=in</device-container>
```

```

    </cns-device-info>
    <cns-application-info>
      <cns-application-name>SampleTestApp</cns-application-name>
      <cns-subject-mapping>
        <cns-original-subject>SampleTestApp.Event1</cns-original-subject>

    <cns-pub-mapping>SampleTestApp.Event1.cns-pub-mapping</cns-pub-mapping>

    <cns-sub-mapping>SampleTestApp.Event1.cns-sub-mapping</cns-sub-mapping>
      <cns-pub-default>0</cns-pub-default>
      <cns-sub-default>0</cns-sub-default>
    </cns-subject-mapping>
    <cns-subject-mapping>
      <cns-original-subject>SampleTestApp.Event2</cns-original-subject>

    <cns-pub-mapping>SampleTestApp.Event2.cns-pub-mapping</cns-pub-mapping>

    <cns-sub-mapping>SampleTestApp.Event2.cns-sub-mapping</cns-sub-mapping>
      <cns-pub-default>0</cns-pub-default>
      <cns-sub-default>0</cns-sub-default>
    </cns-subject-mapping>
  </cns-application-info>
  <cns-group-info>
    <cns-group-name>SampleGroup1</cns-group-name>
    <cns-group-application-name>SampleTestApp</cns-group-application-name>
    <cns-group-member>SampleDevice1</cns-group-member>
    <cns-group-member>SampleDevice2</cns-group-member>
    <cns-group-member>SampleDevice3</cns-group-member>
  </cns-group-info>
  <cns-group-info>
    <cns-group-name>SampleGroup2</cns-group-name>
    <cns-group-application-name>SampleTestApp</cns-group-application-name>
    <cns-group-member>SampleDevice1</cns-group-member>
    <cns-group-member>SampleDevice2</cns-group-member>
    <cns-group-member>SampleDevice3</cns-group-member>
    <cns-group-member>
      device-container="ou=SampleSubDevices,ou=CNSDevices,ou=cns-pokhran4,o=infy,c=in">SampleDev
      ice4</cns-group-member>
    <cns-group-member>
      device-container="ou=SubSubDevices,ou=SampleSubDevices,ou=CNSDevices,ou=cns-pokhran4,o=inf
      y,c=in">SampleDevice5</cns-group-member>
  </cns-group-info>
</NSM-DATA>
</cns-element-data>
</cns-bulk-upload>

```

NSM Data Sample With Image Information

The following example shows an NSM data sample with image information:

```

<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE cns-bulk-upload SYSTEM "BulkUpload.dtd">
<cns-bulk-upload stop-on-error="false">
  <cns-element-data>
    <NSM-DATA op-type="add" validate-data="false">
      <cns-device-container>
        <device-container-name>xyzSubDevices</device-container-name>
      </cns-device-container>
      <cns-device-container>
        <device-container-name>SubSubDevices</device-container-name>

    <parent-container>ou=xyzSubDevices,ou=CNSDevices,ou=cns-pokhran4,o=cisco,c=us</parent-cont
    ainer>

```



```

</cns-device-container>
<cns-device-info>
  <cns-device-name>xyzDevice1</cns-device-name>
  <cns-extended-attr
name="IOSconfigtemplate">DemoRouter.cfgtpl</cns-extended-attr>
  <cns-extended-attr name="IOSConfigID">xyzDevice1</cns-extended-attr>
  <cns-extended-attr name="IOSEventID">xyzDevice1</cns-extended-attr>
  <dev-image-information>
    <image-id>xyzDevice1</image-id>
    <activation-template>DemoRouter.cfgtpl</activation-template>
    <dev-image-info>
      <image-name>xyzIMAGEObj1</image-name>
      <distribution overwrite="yes" erase-flash="no" activate="false">
        <destination>flash</destination>
        <location>tftp://test.com/c7200-js-mz1</location>
      </distribution>
    </dev-image-info>
  </dev-image-information>
</cns-device-info>
<cns-device-info>
  <cns-device-name>xyzDevice2</cns-device-name>
  <cns-extended-attr
name="IOSconfigtemplate">DemoRouter.cfgtpl</cns-extended-attr>
  <cns-extended-attr name="IOSConfigID">xyzDevice2</cns-extended-attr>
  <cns-extended-attr name="IOSEventID">xyzDevice2</cns-extended-attr>
  <dev-image-information>
    <image-id>xyzDevice2</image-id>
    <activation-template>DemoRouter.cfgtpl</activation-template>
    <dev-image-info>
      <image-name>xyzIMAGEObj2</image-name>
      <distribution overwrite="yes" erase-flash="no" activate="false">
        <destination>flash</destination>
        <location>tftp://test.com/c7200-js-mz2</location>
      </distribution>
    </dev-image-info>
  </dev-image-information>
</cns-device-info>
<cns-device-info>
  <cns-device-name>xyzDevice3</cns-device-name>
  <cns-extended-attr
name="IOSconfigtemplate">DemoRouter.cfgtpl</cns-extended-attr>
  <cns-extended-attr name="IOSConfigID">xyzDevice3</cns-extended-attr>
  <cns-extended-attr name="IOSEventID">xyzDevice3</cns-extended-attr>
  <dev-image-information>
    <image-id>xyzDevice3</image-id>
    <activation-template>DemoRouter.cfgtpl</activation-template>
    <dev-image-info>
      <image-name>xyzIMAGEObj3</image-name>
      <distribution overwrite="yes" erase-flash="no" activate="false">
        <destination>flash</destination>
        <location>tftp://test.com/c7200-js-mz3</location>
      </distribution>
    </dev-image-info>
  </dev-image-information>
</cns-device-info>
<cns-device-info>
  <cns-device-name>xyzDevice4</cns-device-name>
  <cns-extended-attr
name="IOSconfigtemplate">DemoRouter.cfgtpl</cns-extended-attr>
  <cns-extended-attr name="IOSConfigID">xyzDevice4</cns-extended-attr>
  <cns-extended-attr name="IOSEventID">xyzDevice4</cns-extended-attr>

<device-container>ou=xyzSubDevices,ou=CNSDevices,ou=cns-pokhran4,o=cisco,c=us</device-cont
ainer>

```

```

<dev-image-information>
  <image-id>xyzDevice4</image-id>
  <activation-template>DemoRouter.cfgtpl</activation-template>
  <dev-image-info>
    <image-name>xyzIMAGEObj4</image-name>
    <distribution overwrite="yes" erase-flash="no" activate="false">
      <destination>flash</destination>
      <location>tftp://test.com/c7200-js-mz4</location>
    </distribution>
  </dev-image-info>
</dev-image-information>
</cns-device-info>
<cns-device-info>
  <cns-device-name>xyzDevice5</cns-device-name>
  <cns-extended-attr
name="IOSconfigtemplate">DemoRouter.cfgtpl</cns-extended-attr>
  <cns-extended-attr name="IOSConfigID">xyzDevice5</cns-extended-attr>
  <cns-extended-attr name="IOSEventID">xyzDevice5</cns-extended-attr>

<device-container>ou=SubSubDevices,ou=xyzSubDevices,ou=CNSDevices,ou=cns-pokhran4,o=cisco,
c=us</device-container>
  <dev-image-information>
    <image-id>xyzDevice5</image-id>
    <activation-template>DemoRouter.cfgtpl</activation-template>
    <dev-image-info>
      <image-name>xyzIMAGEObj5</image-name>
      <distribution overwrite="yes" erase-flash="no" activate="false">
        <destination>flash</destination>
        <location>tftp://test.com/c7200-js-mz5</location>
      </distribution>
    </dev-image-info>
  </dev-image-information>
</cns-device-info>
<cns-application-info>
  <cns-application-name>xyzTestApp</cns-application-name>
  <cns-subject-mapping>
    <cns-original-subject>xyzTestApp.Event1</cns-original-subject>
    <cns-pub-mapping>xyzTestApp.Event1.cns-pub-mapping</cns-pub-mapping>
    <cns-sub-mapping>xyzTestApp.Event1.cns-sub-mapping</cns-sub-mapping>
    <cns-pub-default>1</cns-pub-default>
    <cns-sub-default>1</cns-sub-default>
  </cns-subject-mapping>
  <cns-subject-mapping>
    <cns-original-subject>xyzTestApp.Event2</cns-original-subject>
    <cns-pub-mapping>xyzTestApp.Event2.cns-pub-mapping</cns-pub-mapping>
    <cns-sub-mapping>xyzTestApp.Event2.cns-sub-mapping</cns-sub-mapping>
    <cns-pub-default>1</cns-pub-default>
    <cns-sub-default>1</cns-sub-default>
  </cns-subject-mapping>
</cns-application-info>
<cns-group-info>
  <cns-group-name>xyzGroup1</cns-group-name>
  <cns-group-application-name>xyzTestApp</cns-group-application-name>
  <cns-group-member>xyzDevice1</cns-group-member>
  <cns-group-member>xyzDevice2</cns-group-member>
  <cns-group-member>xyzDevice3</cns-group-member>
</cns-group-info>
<cns-group-info>
  <cns-group-name>xyzGroup2</cns-group-name>
  <cns-group-application-name>xyzTestApp</cns-group-application-name>
  <cns-group-member>xyzDevice1</cns-group-member>
  <cns-group-member>xyzDevice2</cns-group-member>
  <cns-group-member>xyzDevice3</cns-group-member>

```

```

        <cns-group-member
device-container="ou=xyzSubDevices,ou=CNSDevices,ou=cns-pokhran4,o=cisco,c=us">xyzDevice4<
/cns-group-member>
        <cns-group-member
device-container="ou=SubSubDevices,ou=xyzSubDevices,ou=CNSDevices,ou=cns-pokhran4,o=cisco,
c=us">xyzDevice5</cns-group-member>
    </cns-group-info>
</NSM-DATA>
</cns-element-data>
</cns-bulk-upload>

```

NOTES

- For Bulk Upload of NSM devices with Image Info, make sure that the image objects referenced in the **dev-image-info** element tag already exist.
- The location given should be one of the multiple image locations specified with the image object.
- If there are errors while adding the devices, please check the error file provided as a result of the Upload operation. There can be an exception given as CISException, which points to the CISDevice creation failed, which could have occurred if you had ignored the checklist. In this case, just recheck the information provided in the **dev-image-information** element tag. Correct the file and upload it again.

Image Sample Data

The following example shows image data sample:

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cns-bulk-upload SYSTEM "BulkUpload.dtd">
<cns-bulk-upload stop-on-error="false">
  <cns-element-data>
    <IMAGE-DATA op-type="add">
      <image>
        <name>xyzIMAGEObj1</name>
        <image-info image-type="IOS">
          <img-name>c7200-js-mz1</img-name>
          <img-chksum>0x1256faf245</img-chksum>
          <software-version>12.2(8)T6</software-version>
          <system-description>Cisco Network Operating
System</system-description>
          <file-byte-size>1040</file-byte-size>
          <platform-family-name>7200</platform-family-name>
          <img-location>tftp://test.com/c7200-js-mz1</img-location>
        </image-info>
      </image>
      <image>
        <name>xyzIMAGEObj2</name>
        <image-info image-type="IOS">
          <img-name>c7200-js-mz2</img-name>
          <img-chksum>0x1256faf245</img-chksum>
          <software-version>12.2(8)T6</software-version>
          <system-description>Cisco Network Operating
System</system-description>
          <file-byte-size>1040</file-byte-size>
          <platform-family-name>7200</platform-family-name>
          <img-location>tftp://test.com/c7200-js-mz2</img-location>
        </image-info>
      </image>
      <image>
        <name>xyzIMAGEObj3</name>

```

```

        <image-info image-type="IOS">
            <img-name>c7200-js-mz3</img-name>
            <img-chksum>0x1256faf245</img-chksum>
            <software-version>12.2(8)T6</software-version>
            <system-description>Cisco Network Operating
System</system-description>
            <file-byte-size>1040</file-byte-size>
            <platform-family-name>7200</platform-family-name>
            <img-location>tftp://test.com/c7200-js-mz3</img-location>
        </image-info>
    </image>
    <image>
        <name>xyzIMAGEObj4</name>
        <image-info image-type="IOS">
            <img-name>c7200-js-mz4</img-name>
            <img-chksum>0x1256faf245</img-chksum>
            <software-version>12.2(8)T6</software-version>
            <system-description>Cisco Network Operating
System</system-description>
            <file-byte-size>1040</file-byte-size>
            <platform-family-name>7200</platform-family-name>
            <img-location>tftp://test.com/c7200-js-mz4</img-location>
        </image-info>
    </image>
    <image>
        <name>xyzIMAGEObj5</name>
        <image-info image-type="IOS">
            <img-name>c7200-js-mz5</img-name>
            <img-chksum>0x1256faf245</img-chksum>
            <software-version>12.2(8)T6</software-version>
            <system-description>Cisco Network Operating
System</system-description>
            <file-byte-size>1040</file-byte-size>
            <platform-family-name>7200</platform-family-name>
            <img-location>tftp://test.com/c7200-js-mz5</img-location>
        </image-info>
    </image>
    </IMAGE-DATA>
</cns-element-data>
</cns-bulk-upload>

```

IMGW Sample Data

The following example shows an IMGW data sample for bulk upload:

```

<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE cns-bulk-upload SYSTEM "BulkUpload.dtd">
<cns-bulk-upload stop-on-error="false">
    <cns-element-data>
        <IMGW-DATA op-type="add">
            <imgw-device>
                <device-id>xyzIMGWDevice1</device-id>
                <gateway-id>xyzIMGWGatewayID1</gateway-id>
                <device-type>IOS</device-type>
            </imgw-device>
            <imgw-device>
                <device-id>xyzIMGWDevice2</device-id>
                <gateway-id>xyzIMGWGatewayID2</gateway-id>
                <device-type>IOS</device-type>
                <hop-information>
                    <hop-type>IOS_LOGIN</hop-type>
                    <ip-address>0.0.0.0</ip-address>
                    <port>0000</port>
                </hop-information>
            </imgw-device>
        </IMGW-DATA>
    </cns-element-data>
</cns-bulk-upload>

```

```

        <username>xyzusr2</username>
        <password>xyzpwd2</password>
    </hop-information>
</imgw-device>
<imgw-device>
    <device-id>xyzIMGWDevice3</device-id>
    <gateway-id>xyzIMGWGatewayID3</gateway-id>
    <device-type>IOS</device-type>
    <hop-information>
        <hop-type>IOS_LOGIN</hop-type>
        <ip-address>0.0.0.0</ip-address>
        <port>0000</port>
        <username>xyzusr3</username>
        <password>xyzpwd3</password>
    </hop-information>
    <hop-information>
        <hop-type>IOS_LOGIN</hop-type>
        <ip-address>0.0.0.0</ip-address>
        <port>0000</port>
        <username>xyzuser3</username>
        <password>xyzpasswd3</password>
    </hop-information>
</imgw-device>
<imgw-device>
    <device-id>xyzIMGWDevice4</device-id>
    <gateway-id>xyzIMGWGatewayID4</gateway-id>
    <device-type>IOS</device-type>
    <hop-information>
        <hop-type>IOS_LOGIN</hop-type>
        <ip-address>0.0.0.0</ip-address>
        <port>0000</port>
        <username>xyzusr4</username>
        <password>xyzpwd4</password>
    </hop-information>
    <hop-information>
        <hop-type>IOS_LOGIN</hop-type>
        <ip-address>0.0.0.0</ip-address>
        <port>0000</port>
        <username>xyzuser4</username>
        <password>xyzpasswd4</password>
    </hop-information>
</imgw-device>
<imgw-device>
    <device-id>xyzIMGWDevice5</device-id>
    <gateway-id>xyzIMGWGatewayID5</gateway-id>
    <device-type>IOS</device-type>
    <hop-information>
        <hop-type>IOS_LOGIN</hop-type>
        <ip-address>0.0.0.0</ip-address>
        <port>0000</port>
        <username>xyzusr5</username>
        <password>xyzpwd5</password>
    </hop-information>
    <hop-information>
        <hop-type>IOS_LOGIN</hop-type>
        <ip-address>0.0.0.0</ip-address>
        <port>0000</port>
        <username>xyzuser5</username>
        <password>xyzpasswd5</password>
    </hop-information>
</imgw-device>
</IMGW-DATA>
</cns-element-data>
</cns-bulk-upload>

```

Updating Configurations for IMGW Devices

In order to modify configurations for IMGW devices, corresponding CNS devices with the same device names must be created in the Configure Registrar.

The steps for updating configurations for IMGW devices in the Configure Registrar are outlined as follows:

-
- Step 1** Create a CNS device, making sure its device name is the same as that of its corresponding IMGW device (see [“How to Add a Device” section on page 2-9](#)).

Provide ConfigID, EventID, and a template file as the ConfigTemplate.



Note ConfigID must be the same as the device name.

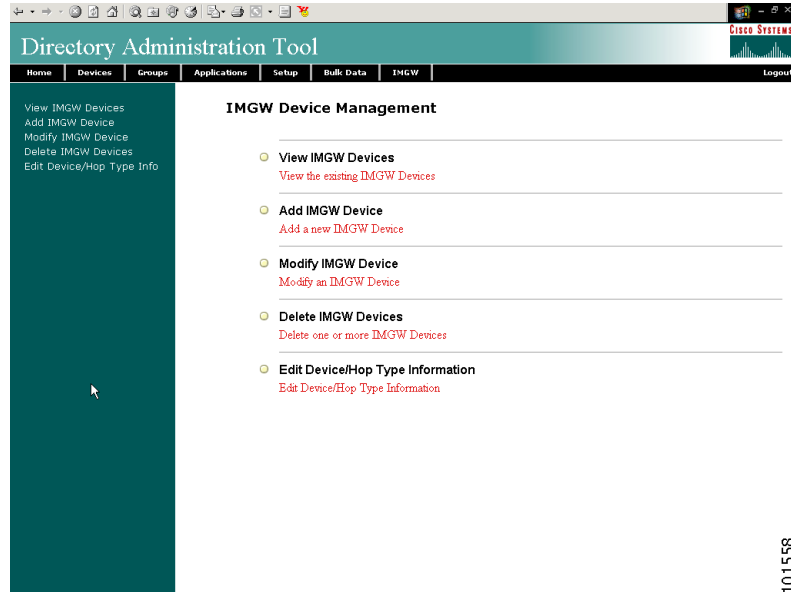
- Step 2** Create template file if it does not exist (see [“Templates and Template Management” section on page 2-57](#)).
- Step 3** Edit template parameters for the device (see [“How to Edit Device Templates” section on page 2-17](#)).
- Step 4** Preview the configuration for the device (see [“How to View Device Configuration” section on page 2-8](#)).
- Step 5** Update the device configuration (see [“How to Update Device Configuration and Image” section on page 2-19](#)).
- Check the response message returned by IMGW (see [“How to View Log Files” section on page 2-71](#)).
-

Managing IMGW Parameters

To manage IMGW parameters, from the main menu, click the **IMGW** tab.

The IMGW main menu appears (see [Figure 4-44](#)).

Figure 4-44 IMGW Device Management



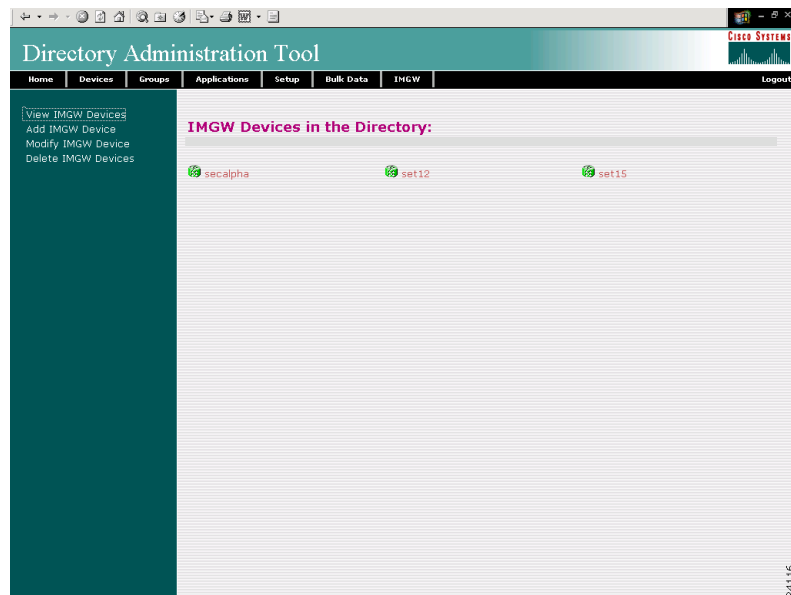
How to View IMGW Devices

To view IMGW devices in the system, click **View IMGW Devices**.

The IMGW Devices page appears (see Figure 4-45).

You can see the details of a particular device by clicking on the device icon.

Figure 4-45 IMGW Devices in the System



Adding IMGW Devices to the System

This section describes how to add IMGW devices to the system. However, before adding a device to IMGW, you should be familiar with hop tables.

Hop Tables

To access devices by means of Telnet, it is necessary to construct hop tables (see “[HopInfo Examples](#)” section on page 4-58). These are tables that indicate what network path exists to the device, as well as all the authentication information necessary at each stage, or hop.

What You Should Know About Device Hop Information

The Hop Information (HopInfo) structure describes one portion of the path between source and destination. HopInfo can be chained together to specify how to login to a device. Examples of uses of this structure include:

- Devices with basic authentication mode requiring IP address, username, and password
- Devices with additional authentication modes such as Cisco IOS enable mode
- Embedded-within-embedded applications such as linecards on a Catalyst switch

The latter two examples require a login, but not a hop to a different device. Therefore, they are referred to as *virtual* hops.

[Table 4-12](#) shows the fields in the HopInfo structure:

Table 4-12 HopInfo Structure

Field	Purpose
hop_type	String indicating type of hop.
ip_address	IP address of device (string)
port	TCP port on which to access device (integer)
username	Username with which to login to device (string)
password	Password with which to login to device (string)

Currently Supported Device Types

[Table 4-13](#) through [Table 4-20](#) on page 4-58 provide the HopInfo list for devices that are directly accessible on the network by IMGW. For accessing devices by way of Commserver, see [Table 4-21](#) on page 4-58.

All the rows in these tables are mandatory. Also, the hop_type fields cannot be NULL or empty. The fields marked with **X** are mandatory in IMGW unless they are not required on the device-side.

Table 4-13 Cisco IOS Device Directly Connected

hop_type	ip_address	port	username	password
IOS_LOGIN	X		X	X
IOS_EN			X	X

Table 4-14 Cisco IOS Device Directly Connected Supporting SSH

hop_type	ip_address	port	username	password
IOS_LOGIN:SSH	X		X	X
IOS_EN			X	X

Table 4-15 Catalyst Device Directly Connected

hop_type	ip_address	port	username	password
CATALYST_LOGIN	X		X	X
CATALYST_EN			X	X

Table 4-16 Catalyst IOS MSFC Blade Directly Connected

hop_type	ip_address	port	username	password
CATALYST_LOGIN	X		X	X
IOS_CAT_BLADE		X	X	X
IOS_EN			X	X

Table 4-17 Catalyst IOS Device Directly Connected

hop_type	ip_address	port	username	password
CATIOS_LOGIN	X		X	X
CATIOS_EN			X	X

Table 4-18 CSS Device Directly Connected

hop_type	ip_address	port	username	password
CSS_LOGIN	X		X	X
CSS_EN			X	X

Table 4-19 CE Device Directly Connected

hop_type	ip_address	port	username	password
CE_LOGIN	X		X	X
CE_EN			X	X

Table 4-20 PIX Device Directly Connected

hop_type	ip_address	port	username	password
PIX_LOGIN	X		X	X
PIX_EN			X	X

When any of the above devices is accessed by way of a Commserver (such as a Cisco 2511 Access Server), the resultant HopInfo list has the following two rows prepended to the respective HopInfo list for that device:

Table 4-21 Partial HopInfo List For Commserver Access

hop_type	ip_address	port	username	password
COMMSERVER_LOGIN	X		X	X
COMMSERVER		X	////////////////	X

**Note**

Because the current release does not support port username, the username field of HopInfo structure for COMMSERVER is always ignored by IMGW. Do not set up the port username on the Commserver.

HopInfo Examples**Table 4-22 Cisco IOS Device Directly Connected**

hop_type	ip_address	port	username	password
IOS_LOGIN	172.28.6.90		Johndoe	Passnow
IOS_EN			dummy	compass

Table 4-23 Cisco IOS Device Directly Connected Supporting SSH

hop_type	ip_address	port	username	password
IOS_LOGIN:SSH	172.28.6.90		Johndoe	Passnow
IOS_EN			dummy	compass

Table 4-24 Cisco IOS Device Connected With Commserver

hop_type	ip_address	port	username	password
COMMSERVER_LOGIN	172.28.6.226		Sandra	Me1100
COMMSERVER		2005	////////////////	Lab123
IOS_LOGIN			Johndoe	Passnow
IOS_EN			dummy	compass

Table 4-25 Catalyst IOS MFSC Blade Directly Connected

hop_type	ip_address	port	username	password
CATALYST_LOGIN	172.29.132.32		Admin	Raining
IOS_CAT_BLADE		15	Admin	winding
IOS_EN			dummy	moonlight

Table 4-26 Catalyst IOS MFSC Blade Accessed With Commsrver

hop_type	ip_address	port	username	password
COMMSERVER_LOGIN	172.28.22.229		Kldfg	Dsdsfg
COMMSERVER		2010	////////////////	Dadada
CATALYST_LOGIN			Admin	Raining
IOS_CAT_BLADE		15	Admin	winding
IOS_EN			dummy	moonlight

How to Add an IMGW Device

To add an IMGW device to the system, follow these steps:

- Step 1** From the IMGW main menu, click **Add IMGW Device**.
The Add IMGW Device page appears (see [Figure 4-46](#)).

Figure 4-46 Add IMGW Devices

Add IMGW Device:

Device Name (required)

Gateway Id (required)

Device Type (required) Select Device Type

Agent Type (required)

- ConfigAgent
- ImageAgent
- ConfigAgent: ImageAgent

Hop Information

Hop Type	IP Address	Port	Username	Password	Confirm Password
Select Hop Type <input type="button" value="v"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Select Hop Type <input type="button" value="v"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Select Hop Type <input type="button" value="v"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

Add More Hops

Add Reset

101486

Step 2 Enter the name of the device in the **Device Name** field.

[Table 4-27](#) lists valid values for these fields.

Table 4-27 Valid Values for Add IMGW Device

Attribute	Description	Valid Values
Device Name	The name used as cn (common name) of the IMGW device.	Non-empty string excluding the special characters: !, ", #, \$, %, &, ', (,), *, /, <, >, ?, @, \, ^, `, ~
Gateway ID	Gateway identifier for this device.	Non-empty string excluding the special characters: !, ", #, \$, %, &, ', (,), *, /, <, >, ?, @, \, ^, `, ~
Device Type	Type of IMGW device.	From drop-down list
Agent Type	Type of agent you want IMGW to simulate.	From drop-down list
Hop Type	Nature of the particular connection hop.	From drop-down list
IP Address	IP address of the connecting node in the hop	Valid IP address of the following format: 10.1.14.216
Port	Port number of the node.	Integer values
Username	Username to login to the hop node.	String excluding the special characters: !, ", #, \$, %, &, ', (,), *, /, <, >, ?, @, \, ^, `, ~
Password	Password to login to the hop node.	Non-null string

Step 3 Enter the gateway ID in the **Gateway Id** field.



Note The gateway ID for IMGW devices must be the same as that entered during **Setup** (see [“Re-configure IMGW Parameters”](#) section on page 2-9). By convention, hostname is used as the gateway ID.

Step 4 Select the device type from the drop-down list.

Step 5 Select the agent type from the drop-down list.

Step 6 Enter parameters about each hop in the **Hop Information** fields.
For more information, see [“Hop Tables”](#) section on page 4-56.

Step 7 To add more hops, click **Add More Hops**.

Step 8 To clear your entries and start over, click **Reset**.

- Step 9** To add this IMGW device to the system, click **Add**.
- Step 10** To return to the main menu, click the **Home** tab.

How to Modify IMGW Devices

To modify an IMGW device to the system, follow these steps:

- Step 1** From the IMGW main menu, click **Modify IMGW Device**.
The Modify IMGW Device page appears (see [Figure 4-47](#)).

Figure 4-47 Modify IMGW Devices

The screenshot shows the 'Modify IMGW Device: cat132' interface. It features a table for 'Hop Information' with the following data:

Delete	Hop Type	IP Address	Port	Username	Password	Confirm Password
<input type="checkbox"/>	CATALYST_LOGIN	1.1.1.1	0			

Below the table is an 'Add More Hops' button. At the bottom of the page are 'Modify' and 'Reset' buttons. A vertical ID '10.1563' is visible on the right side.

- Step 2** Modify all required fields.
[Table 4-28](#) lists valid values for these fields.

Table 4-28 Valid Values for Modify IMGW Device

Attribute	Description	Valid Values
Hop Type	Type of IMGW hop.	From drop-down list
IP Address	IP address of the connecting node in the hop	Valid IP address of the following format: 10.1.14.216
Port	Port number of the node.	Integer values
Username	Username to login to the hop node.	String excluding the special characters: !, ", #, \$, %, &, ', (,), *, /, <, >, ?, @, \, ^, ` , ~
Password	Password to login to the hop node.	Non-null string

- Step 3** To add more hops, click **Add More Hops**.
- Step 4** To delete a hop, select the **Delete** check-box.

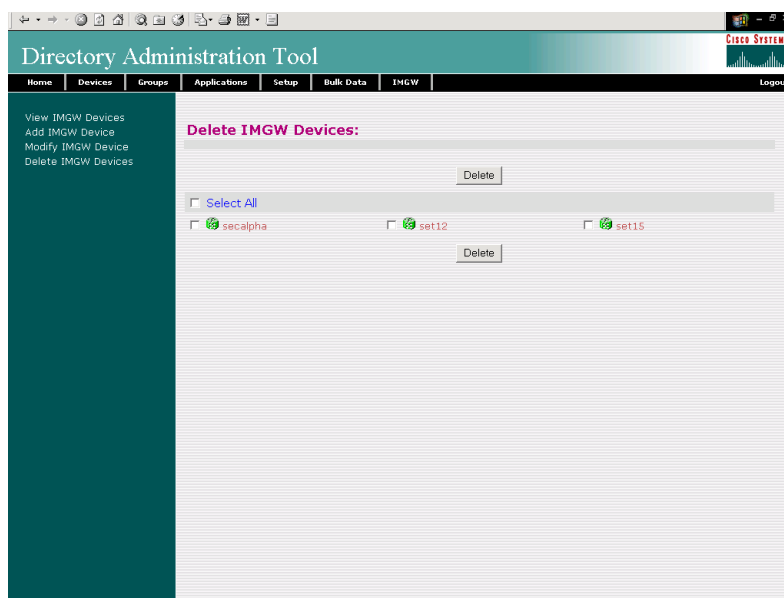
- Step 5** To clear your entries and start over, click **Reset**.
- Step 6** To apply these changes, click **Modify**.
- Step 7** To return to the main menu, click the **Home** tab.

How to Delete IMGW Devices

To delete IMGW devices from the system, follow these steps:

- Step 1** From the IMGW main menu, click **Delete IMGW Devices**.
The delete IMGW devices page appears (see [Figure 4-48](#)).

Figure 4-48 Delete IMGW Devices



- Step 2** Check all IMGW devices you want to delete from the system.
- Step 3** To delete these IMGW devices, click **Delete**.
To return to the main menu, click the **Home** tab.

How to Edit Device/Hop Type Information

To complete information about how to edit device and hop type information using the IMGW Device Module Toolkit, see [Appendix B, “How to Use the IMGW Device Module Development Toolkit.”](#)