Device and Subdevice Manager

To access Device tasks, log into the system (see "Logging In" section on page 2-23). Then, from the Home page, click the **Devices** tab.

The Device Functional Overview page appears showing:

- View Device
- Add Device
- Discover Device
- Edit Device
- Resynchronize Device
- Clone Device
- Delete Device
- Update Device
- Subdevices
- Query Device Inventory
- Delete Files on Device
- Dynamic Operations

Viewing Device Configuration

Step 1 From the Devices Functional Overview page, click **View Device**.

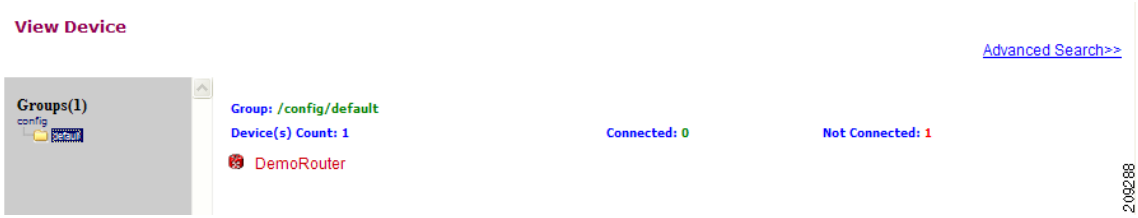
The Groups list appears.

Step 2 From the Groups list, select the group that holds the device you want to view.

Note You can also use the Advance Search feature on many GUI pages to locate devices based on user-define search parameters (see "Using Advanced Search Feature" section on page 3-30).

Step 3 The View Device list page appears (see Figure 3-1).

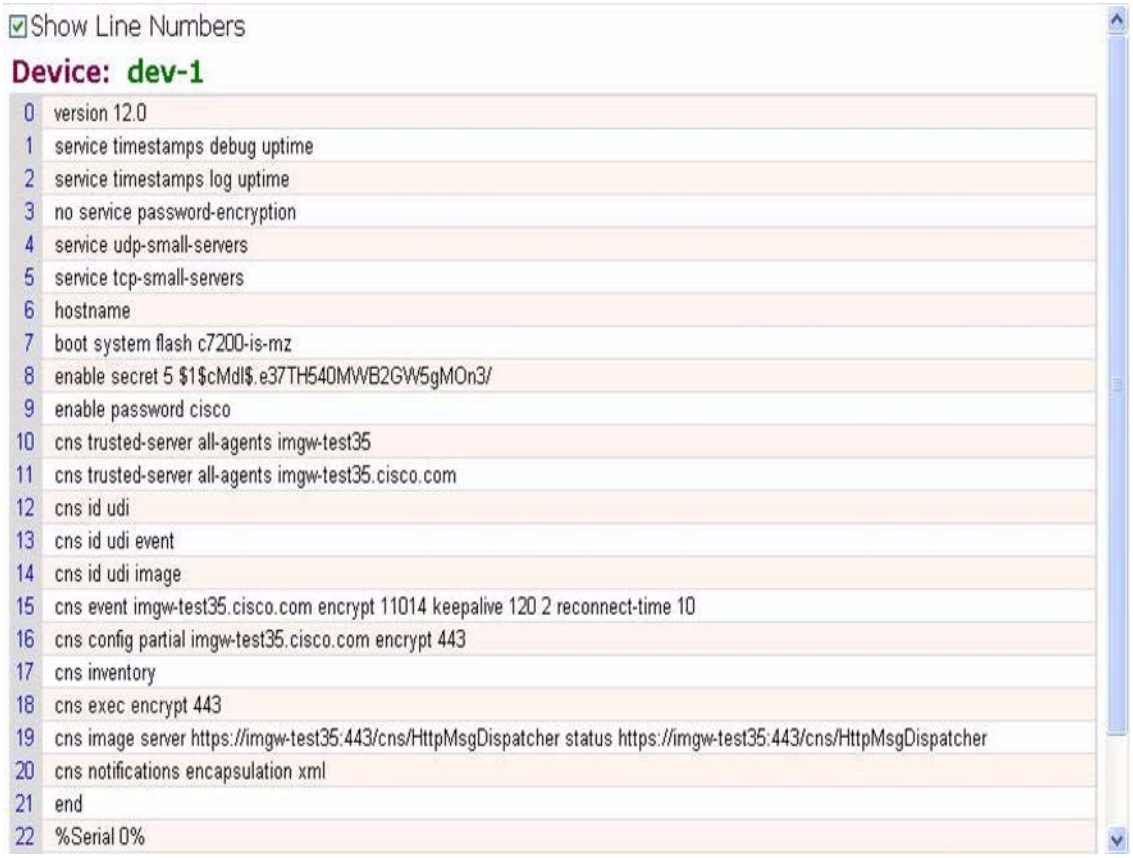
Figure 3-1 View Device List



Step 4 Click on the icon for the device you want to view.

The Configuration for that device appears (see Figure 3-2).

Figure 3-2 Device Configuration



Note The device configuration displayed is the configuration as it appears at the configuration server. It might not be the configuration running on the device.

Step 5 To view subdevices (if applicable), in the left navigation pane, click **View Subdevices.**

Step 6 To view Images associated with this device (if applicable), in the left navigation pane, click **View Images**.

Previewing Device Configuration

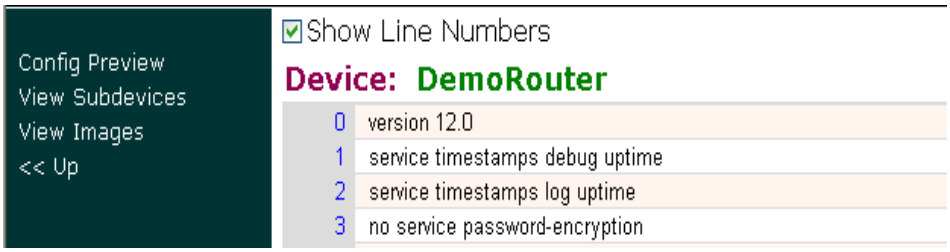
Step 1 From the Devices Functional Overview page, click **Edit Device**. The Groups list appears.

Step 2 From the Groups list, select the group that holds the device in question. The Edit Device list appears.

Step 3 Form the Edit Device list, select the group that holds the device you want to **Preview Device Configuration** or

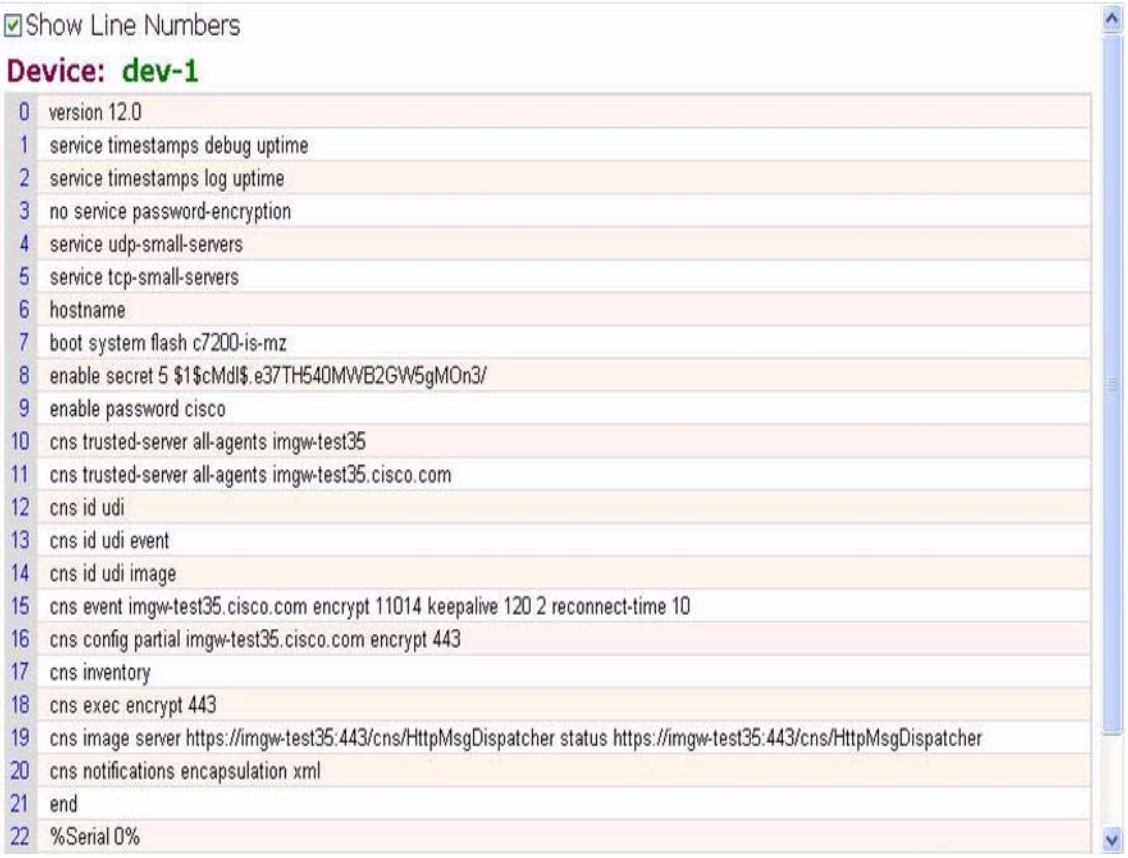
Step 4 From the Devices Functional Overview page, click **View Device**. The Groups list appears (see Figure 3-3).

Figure 3-3 Preview Device Configuration



Step 5 From the Groups list, select the group that holds the device you want to **Preview Device Configuration** (see Figure 3-4).

Figure 3-4 Device Configuration



Step 6 To preview subdevices configuration (if applicable), in the left navigation pane, click **View Subdevices**.

Using Advanced Search Feature

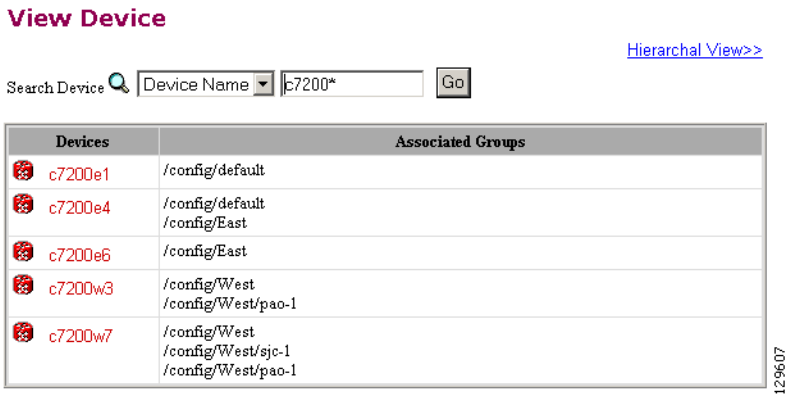
Step 1 From the Hierarchal View of groups (for example, see Figure 3-1), click **Advanced Search**.

Step 2 Use the drop-down arrow to select: **Config ID**, **Event ID**, or **Device Name** for the desired device.

Step 3 Then enter a value that corresponds to the first part of the argument, then click **Go**.

The results of the search are listed (see Figure 3-5).

Figure 3-5 Advanced Search Page



Adding Devices

There are three variations to the Add Device procedures based on **Device Type**:

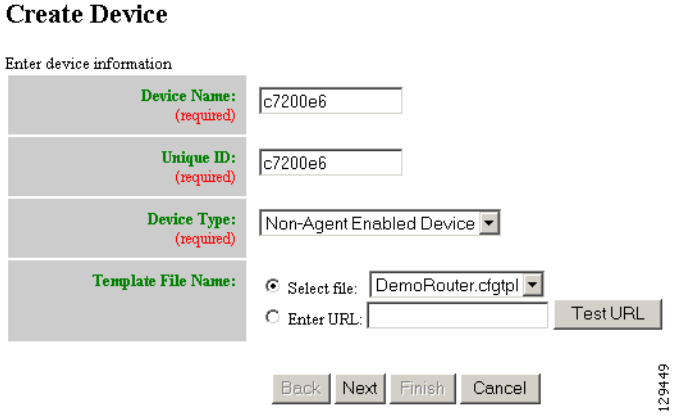
- Non-Agent Enabled Device (see below).
- Agent Enabled Device (see "Adding Agent Enabled Devices" section on page 3-39).
- PIX Firewall Device (see "Adding PIX Firewall Devices" section on page 3-44).
- ASA Firewall Device (see "Adding ASA Firewall Devices" section on page 3-47).

Adding Non-agent Enabled Devices

Step 1 From the Devices Functional Overview page, click **Add Device**.

The Device Information page appears (see Figure 3-6).

Figure 3-6 Device Information Page



Step 2 Enter a valid value (no spaces) in the **Device Name** field.

Table 3-1 shows valid values for these attributes.

Table 3-1 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) :(colon)
Unique ID	Unique ID of the device.	Default or a-z A-Z 0-9 -(hyphen) _ (under-score) . (period) ,(comma) :(colon) /(forward-slash) =(equal) +(plus)
Device Type	Type of device	From drop-down list
Template File Name	Name of the configuration template to associate with the device.	From drop-down list, or user-defined

Step 3 In the **Unique ID** field, accept the default value that appears or enter another valid value (no spaces).

Step 4 For Device Type, from the drop-down list, select **Non-Agent Enabled Device**.

Step 5 Select the Template file name, then click **Next**.

The Group Membership page appears (see Figure 3-7).

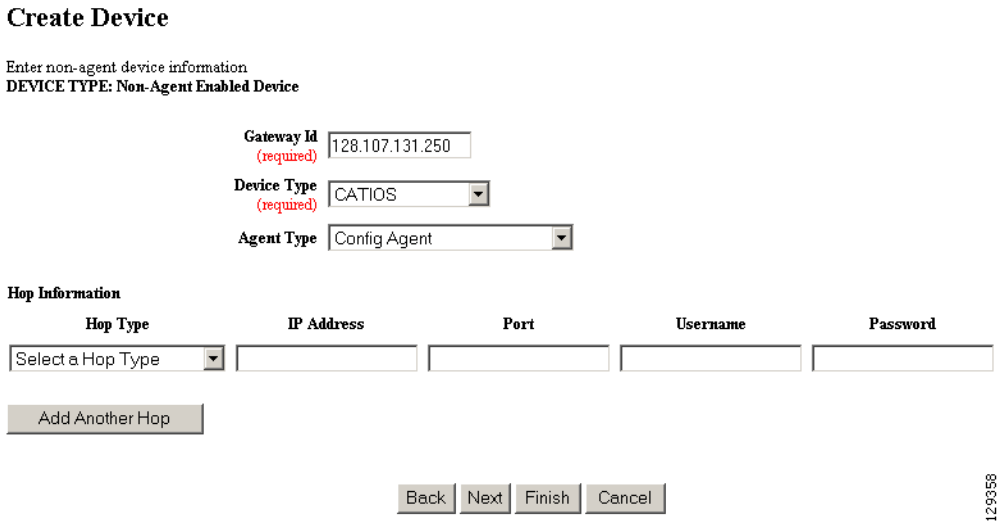
Figure 3-7 Group Membership

Tip Use the Group Manager to set up groups before you add a device (see "Creating Groups" section on page 6-96).

Step 6 Check to select the group(s) of which you want this device to become a member, then click **Next**.

The non-agent information (IMGW) page appears (see Figure 3-8).

Figure 3-8 Non-agent (IMGW) Information Page



Step 7 Enter the name of the device in the **Device Name** field.

Table 3-2 lists valid values for these fields.

Table 3-2 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. This value is established during **Setup**. See *Cisco Configuration Engine Installation and Configuration Guide*.	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

Step 8 Enter the gateway ID in the **Gateway Id** field.

Note This value is established during **Setup**. See *Cisco Configuration Engine Installation and Configuration Guide*.

Step 9 Enter the appropriate Device and Hop information.

Tip Before you enter Hop information, see "Hop Tables" section on page 3-36.

Table 3-3 shows valid values for these fields.

Table 3-3 Valid Values for IMGW Device Hop Information

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 10 To add another hop, click **Add Another Hop**, then enter hop information.

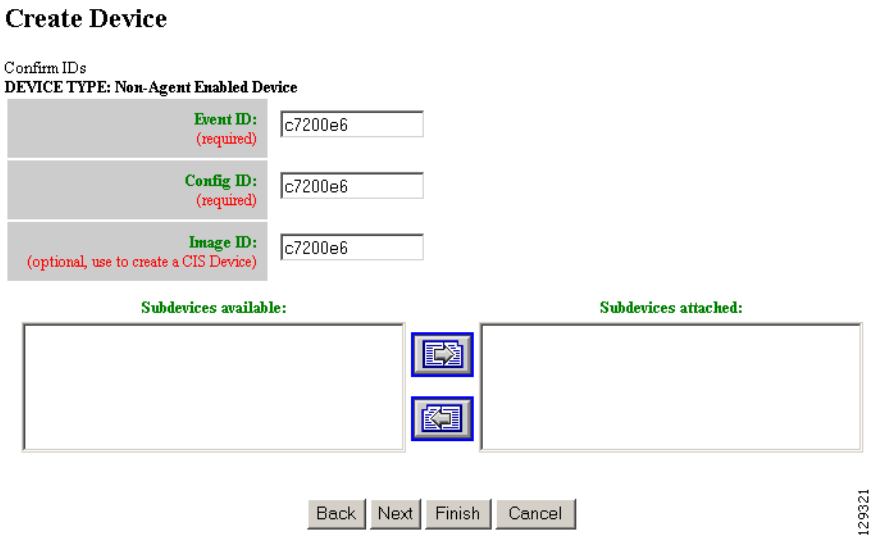
Step 11 To go back one page, click **Back**.

Step 12 To end this task, click **Finish**.

Step 13 To continue, click **Next**.

The Confirm IDs page appears

Figure 3-9 Confirm IDs Page



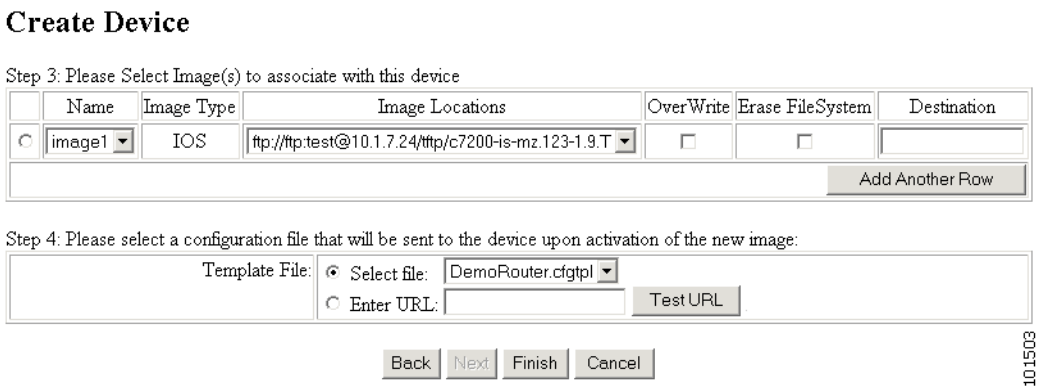
Step 14 To go back one page, click **Back**.

Step 15 To end this task, click **Finish**.

Step 16 To continue, click **Next**.

If you click **Next**, the Image Association page appears (see Figure 3-10).

Figure 3-10 Create Device > Image Association



Step 17 Select the image from the **Name** drop-down list.

The **Image Type** field and **Image Location** drop-down box are populated with corresponding information for the image.

Step 18 From the **Image Location** drop-down list, select the desired location.

Step 19 To add another row for image location, click **Add Another Row**.

You can locate multiple copies of an image on separate servers. This allows you to do load-sharing when updating a large number of devices. Each device in a large group can be associated with a copy of the image located at one of many server locations.

Step 20 In the Destination field, enter a valid URL where the image will be copied.

For example:

disk0:/c7200-mz

Step 21 To indicate which image is to be activated on the device after distribution, select the radio button in front of each row.

Step 22 Select the Configuration Control template file you want to send to this device for activation of a new image:

Tip Use the Configuration Control template that contains the CLI commands required for image activation for this device (see "Configuration Control Templates" section on page 12-127). If you do not have such a template, see "Adding a Template" section on page 12-138.

a. To select a template file from the drop-down list, click the **Select file** radio button.

b. Use the drop-down list to choose a template file.

OR

To use an external template:

a. Choose **Enter URL**.

b. Enter the full URL for the server, directory, and filename where the template is stored. Currently, only **http** is supported.

c. To test access to the external template, click **Test URL**.

If the server is unavailable or the external template cannot be accessed, an error appears. You can still save this logical device, but the template is not available until you have access to the external template.

Step 23 To clear this task, click **Cancel**.

Step 24 To go back to the previous page, click **Back**.

Step 25 To finish creating this device, click **Finish**.

Hop Tables

To access devices by means of Telnet, it is necessary to construct hop tables (see "HopInfo Examples" section on page 3-38). These are tables that indicate what network path exists to the device, and 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 line cards 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 3-4 shows the fields in the HopInfo structure:

Table 3-4 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 3-5 through Table 3-12 on page 3-38 provide the HopInfo list for devices that are directly accessible on the network by IMGW. For accessing devices by way of Commserver, see Table 3-13 on page 3-38.

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 3-5 Cisco IOS Device Directly Connected

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

Table 3-6 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 3-7 Catalyst Device Directly Connected

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

Table 3-8 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 3-9 Catalyst IOS Device Directly Connected

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

Table 3-10 CSS Device Directly Connected

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

Table 3-11 CE Device Directly Connected

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

Table 3-12 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 3-13 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 3-14 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 3-15 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 3-16 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 3-17 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 3-18 Catalyst IOS MFSC Blade Accessed With Commserver

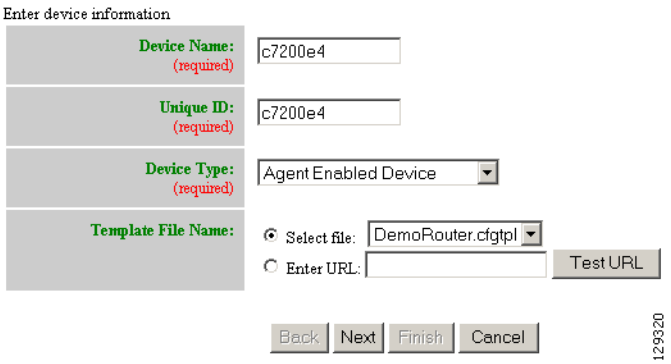
hop_type	ip_address	port	username	password
COMMSERVER_LOGIN	172.28.22.229		Kldfg	Dsdsfg
COMMSERVER		2010	//////////////////	Dadada
CATALYST_LOGIN			Admin	Raining
IOS_CAT_BLADE		15	Admin	winding
IOS_EN			dummy	moonlight

Adding Agent Enabled Devices

Step 1 From the Devices Functional Overview page, click **Add Device**.

The Device Information page appears (see Figure 3-11).

Figure 3-11 Device Information Page



Step 2 Enter a valid value (no spaces) in the **Device Name** field.

Table 3-19 shows valid values for these attributes.

Table 3-19 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)
Unique ID	Unique ID of the device.	Default or a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)
Device Type	Type of device	From drop-down list
Template File Name	Name of the configuration template to associate with the device.	From drop-down list, or user-defined

Step 3 In the **Unique ID** field, accept the default value that appears or enter another valid value (no spaces).

Step 4 For Device Type, from the drop-down list, select **Agent Enabled Device**.

Step 5 Select the Template file name, then click **Next**.

Note To associate an external template to this device, select **Enter URL** with the appropriate path.

The Group Membership page appears (see Figure 3-12).

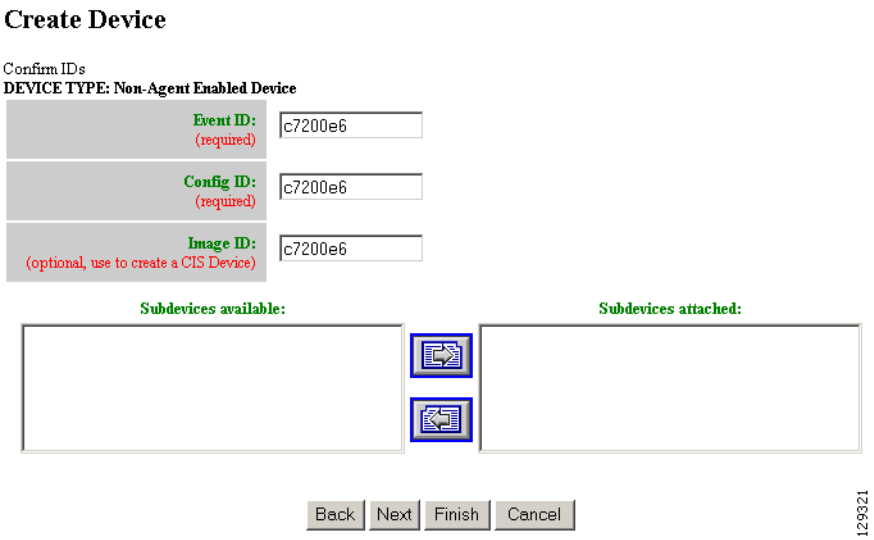
Figure 3-12 Group Membership Page

Tip Use the Group Manager to set up groups before you add a device (see "Creating Groups" section on page 6-96).

Step 6 Check to select the group(s) of which you want this device to become a member, then click **Next**.

The device IDs page appears (see Figure 3-13).

Figure 3-13 Device IDs Page



Step 7 Enter the appropriate IDs.

Table 3-20 shows valid values for these attributes.

Table 3-20 Valid Values for Agent Enabled Device IDs

Attribute	Description	Valid Values
Event ID	Event ID to be associated with this device.	Default, or a-z A-Z 0-9 -(hyphen) _ (under-score) . (period) ,(comma) :(colon) /(forward-slash) =(equal) +(plus)
Config ID	Configuration ID to be associated with this device.	Default, or a-z A-Z 0-9 -(hyphen) _ (under-score) . (period), (comma) :(colon) /(forward-slash) =(equal) +(plus)
Image ID	Image ID to be associated with this device.	Default, or a-z A-Z 0-9 -(hyphen) _ (under-score) . (period) ,(comma) :(colon) /(forward-slash) =(equal) +(plus)

Step 8 If applicable, select and assign subdevices to this device.

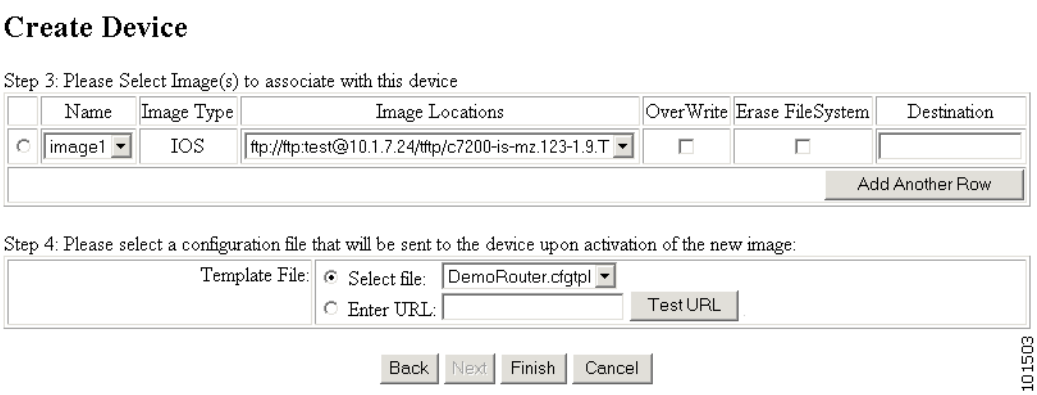
Step 9 To go back one page, click **Back**.

Step 10 To end this task, click **Finish**.

Step 11 To continue by associating this device with an image, click **Next**.

If you click **Next**, the Image Association page appears (see Figure 3-14).

Figure 3-14 Create Device > Image Association



Step 12 Select the image from the **Name** drop-down list.

The **Image Type** field and **Image Location** drop-down box are populated with corresponding information for the image.

Step 13 From the **Image Location** drop-down list, select the desired location.

Step 14 To add another row for image location, click **Add Another Row**.

You can locate multiple copies of an image on separate servers. This allows you to do load-sharing when updating a large number of devices. Each device in a large group can be associated with a copy of the image located at one of many server locations.

Step 15 In the Destination field, enter a valid URL where the image will be copied.

For example:

disk0:/c7200-mz

Step 16 To indicate which image is to be activated on the device after distribution, select the radio button in front of each row.

Step 17 Select the Configuration Control template file you want to send to this device for activation of a new image:

Tip Use the Configuration Control template that contains the CLI commands required for image activation for this device (see "Configuration Control Templates" section on page 12-127). If you do not have such a template, see "Adding a Template" section on page 12-138.

a. To select a template file from the drop-down list, click the **Select file** radio button.

b. Use the drop-down list to choose a template file.

OR

To use an external template:

a. Choose **Enter URL**.

b. Enter the full URL for the server, directory, and filename where the template is stored. Currently, only **http** is supported.

c. To test access to the external template, click **Test URL**.

   If the server is unavailable or the external template cannot be accessed, an error appears. You can still save this logical device, but the template is not available until you have access to the external template.

Step 18 To clear this task, click **Cancel**.

Step 19 To go back to the previous page, click **Back**.

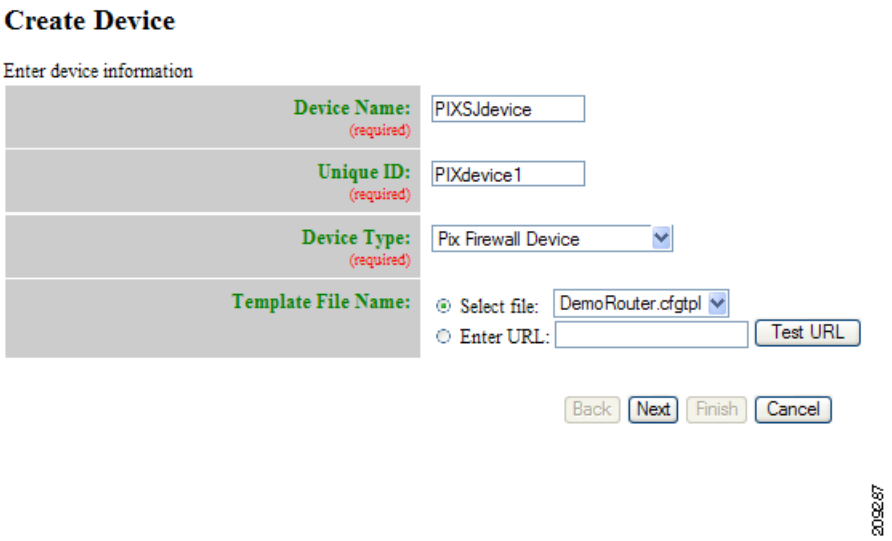
Step 20 To finish creating this device, click **Finish**.

Adding PIX Firewall Devices

Step 1 From the Devices Functional Overview page, click **Add Device**.

The Device Information page appears (see Figure 3-15).

Figure 3-15 Device Information Page



Step 2 Enter a valid value (no spaces) in the **Device Name** field.

Table 3-21 shows valid values for these attributes.

Table 3-21 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)
Unique ID	Unique ID which is configured on the device.	Default or a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)
Device Type	Type of device	From drop-down list
Template File Name	Name of the configuration template to associate with the device.	From drop-down list, or user-defined

Step 3 In the **Unique ID** field, accept the default value that appears or enter another valid value (no spaces).

Step 4 For Device Type, from the drop-down list, select **PIX Firewall Device**.

Step 5 Select the Template file name, then click **Next**.

The Group Membership page appears (see Figure 3-16).

Figure 3-16 Group Membership Page

Tip Use the Group Manager to set up groups before you add a device (see "Creating Groups" section on page 6-96).

Step 6 Check to select the group(s) of which you want this device to become a member, then click **Next**.

The PixAuthentication Password page appears (see Figure 3-17).

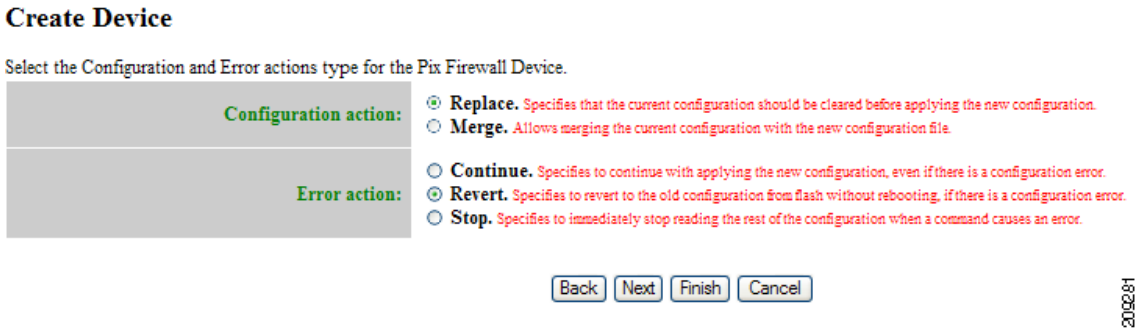
Figure 3-17 PIX Authentication Password Page

Step 7 Enter authentication password for PIX devices.

A case-sensitive password of up to 16 alphanumeric and special characters. Any character can be used in the password except a question mark and a space.

Step 8 Click the **Next** button. The PIX **Configuration and Error Actions Type** page appears (see Figure 3-18).

Figure 3-18 PIX Configuration and Error Actions Type Page



Step 9 From the **Configuration and Error Actions Type** page, choose the appropriate options (Replace, Merge, Continue, Revert, and Stop).

Step 10 To go back one page, click **Back**.

Step 11 To end this task, click **Finish**.

Step 12 To continue by associating this device with an image, click **Next**.

Step 13 If you click **Next**, the Image Association page for PIX Firewall Devices appears.

Step 14 Select the image from the **Name** drop-down list.

The **Image Type** field and **Image Location** drop-down box are populated with corresponding information for the image.

Note Only PIX or PDM images can be associated with a PIX device.

Step 15 From the **Image Location** drop-down list, select the desired location.

Step 16 To add another row for image location, click **Add Another Row**.

Note For PIX devices, you can have only one PIX image and one PDM image.

Step 17 To indicate whether the image is to be activated on the device after distribution, check the box in front of each row.

Step 18 To cancel creating a device and return to the Devices main menu, click **Cancel**.

Step 19 To go back to the previous page, click **Back**.

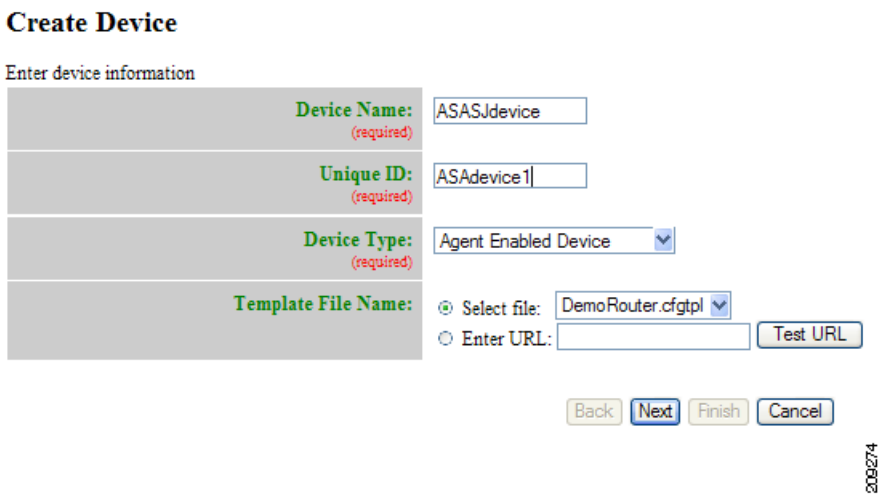
Step 20 To finish creating this device, click **Finish**.

Adding ASA Firewall Devices

Step 1 From the Devices Functional Overview page, click **Add Device**.

The Device Information page appears (see Figure 3-19).

Figure 3-19 Device Information Page



Step 2 Enter a valid value (no spaces) in the **Device Name** field.

Table 3-22 shows valid values for these attributes.

Table 3-22 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)
Unique ID	Unique ID which is configured on the device.	Default or a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)
Device Type	Type of device	From drop-down list
Template File Name	Name of the configuration template to associate with the device.	From drop-down list, or user-defined

Step 3 In the **Unique ID** field, accept the default value that appears or enter another valid value (no spaces).

Step 4 For Device Type, from the drop-down list, select **ASA Firewall Device**.

Step 5 Select the Template file name, then click **Next**.

The Group Membership page appears (see Figure 3-20).

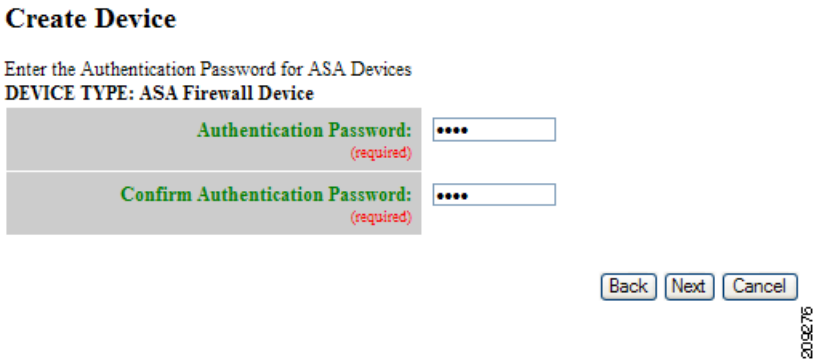
Figure 3-20 Group Membership Page

Tip Use the Group Manager to set up groups before you add a device (see "Creating Groups" section on page 6-96).

Step 6 Check to select the group(s) of which you want this device to become a member, then click **Next**.

The ASA Authentication Password page appears (see Figure 3-21).

Figure 3-21 ASA Authentication Password Page

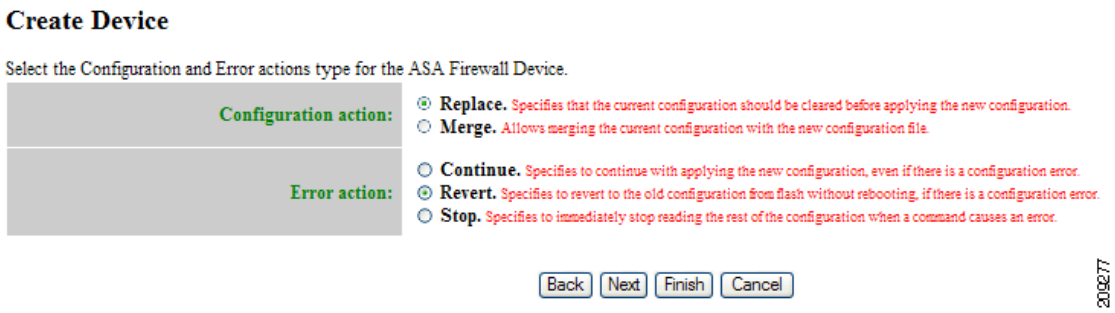


Step 7 Enter authentication password for ASA devices.

A case-sensitive password of up to 16 alphanumeric and special characters. Any character can be used in the password except a question mark and a space.

Step 8 Click the **Next** button. The ASA **Configuration and Error Actions Type** page appears (see Figure 3-17).

Figure 3-22 ASA Configuration and Error Actions Type Page



Step 9 From the **Configuration and Error Actions Type** page, choose the appropriate options (Replace, Merge, Continue, Revert, and Stop).

Step 10 To go back one page, click **Back**.

Step 11 To end this task, click **Finish**.

Step 12 To continue by associating this device with an image, click **Next**.

Step 13 If you click **Next**, the Image Association page for PIX Firewall Devices appears.

Step 14 Select the image from the **Name** drop-down list.

The **Image Type** field and **Image Location** drop-down box are populated with corresponding information for the image.

Note Only ASA or ASDM images can be associated with a ASA device.

Step 15 From the **Image Location** drop-down list, select the desired location.

Step 16 To add another row for image location, click **Add Another Row**.

Note For ASA devices, you can have only one ASA image and one ASDM image.

Step 17 To indicate whether the image is to be activated on the device after distribution, check the box in front of each row.

Step 18 To cancel creating a device and return to the Devices main menu, click **Cancel**.

Step 19 To go back to the previous page, click **Back**.

Step 20 To finish creating this device, click **Finish**.

Discovering Devices

Cisco Configuration Engine can discover a device once the device (for this example: **router-3460**) is configured for CNS. For more information about this, see *CNS Image Agent* at:

http://www.cisco.com/en/US/docs/net_mgmt/configuration_engine/3.5/installation/guide/CE_3_ig_security.html

During the execution of **setup.sh** for the Cisco Configuration Engine host, the settings configured would be:

```
...
For detail information about the parameters in this setup, refer to "Cisco Configuration
Engine Administration Guide."
...

Encryption settings:
--------------------
Enable cryptographic (crypto) operation between Event Gateway(s)/Config server and
device(s) (y/n)? n
Each Event Gateway process serves 500 devices. Maximum number of
Event Gateways allowed is 20.
Enter number of Event Gateways that will be started with crypto operation:[1] 0
Enter number of Event Gateways that will be started with plaintext operation: [5] 2
Enter Cisco-CE Event Bus Network Parameter: [ce_host_hostname or ce_host_ip_address]
```

Note For more information about running **setup.sh**, see the *Cisco Configuration Engine Installation and Configuration Guide*.

Step 1 Log in to **router-3460**

Step 2 Using the Cisco IOS CLI command: **show running configuration**, verify that **router-3460** is configured with IP routing. For example:

```
hostname router-3460
...
ip cef
ip host ce_host 10.1.2.3
...
interface Ethernet0/0
ip address 10.1.2.4 255.255.255.0
...
ip default-gateway 10.1.2.1
```

```
...
ip classless
ip route 0.0.0.0 0.0.0.0 10.1.2.1
```

where:

router-3460 is the hostname identifying the device for Cisco Configuration Engine and 10.1.2.3 is the IP address of the Cisco Configuration Engine.

Step 3 Log in to **router-3640** and perform the following operations:

configure terminal ip host ce_host 10.1.2.3
cns trusted-server all-agents ce_host
cns id string router-3460
cns id string router-3460 event
cns event ce_host 11013
cns config notify all interval 1 old-format
cns config partial ce_host 80
cns exec 80

Note The above configuration will support Discover Device as well as downloading a configuration, which requires **cns config partial ce_host 80**.

Step 4 Verify IP connectivity between **ce_host** and **router-3640** by issuing the **ping** command from **ce_host** to **router-3640** and from **router-3640** to **ce_host**.

Step 5 Create a template.

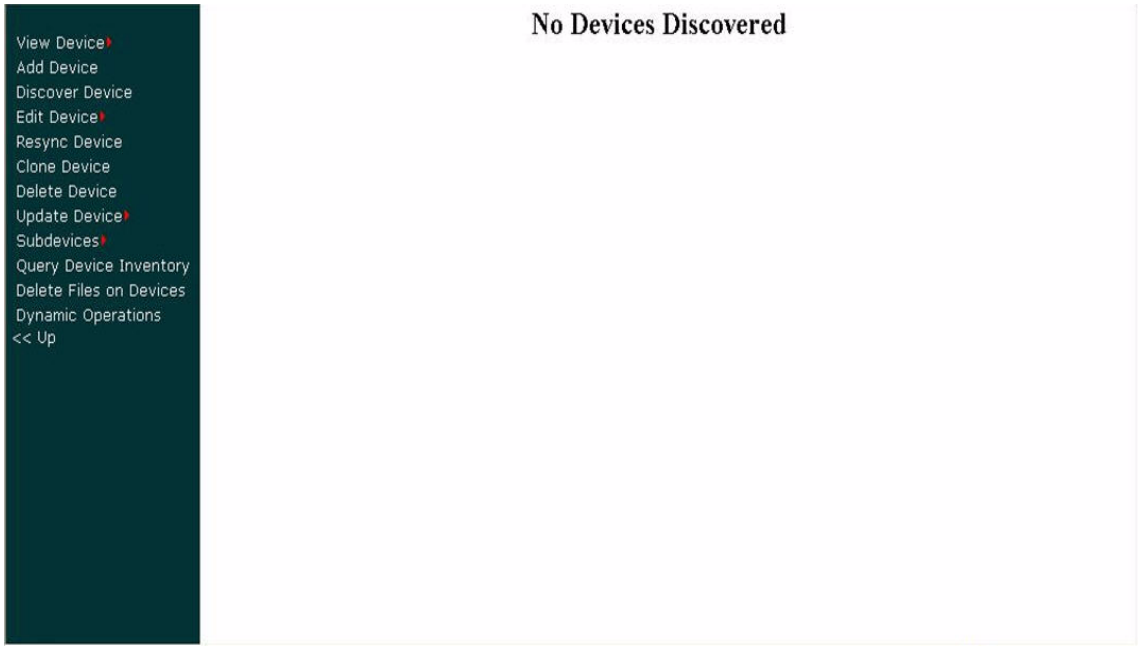
For our example, name it **router-3460**.

You must insert a minimum of one line in the template. You can add a **!** for this.

Note For more information about creating a template, see Chapter 12, "Templates."

Step 6 On the Device Functional Overview page, choose **Discover Device**.

Figure 3-23 Discover Device Page



When the discovery task completes, the following information appears:

```
Discover Devices
There are 1 device(s) currently connected to the IE2100 but not yet created in the
directory.
Select the devices you want to create and click on 'Create'.
Device Name DeviceID Connected Time Template Name Group Name
router-3640 router-3640 1/19/06 9:46:03 AM
- DemoRouter.cfgtpl
- Acquire Running Config /config/default
- Acquire Startup Config
```

Step 7 Click on the check box for **router-3640**, then click on the radio button and move the cursor to **router-3640.cfgtpl**.

Step 8 Choose **Create**.

The following information appears:

```
Status of Discovered Device Creation:
Device Name Template Name Status
router-3640 router-3640.cfgtpl Success
```

Step 9 On the Device Functional Overview page, choose **View Device**.

You should see an icon for **router-3640**.

The icon color should be green indicating communication between **ce_host** and **router-3640** has been established.

Notes:

1. Before a device is discovered or created, we recommend that you configure a template for the device. When Cisco Configuration Engine discovers a device, or you create a device, you then must associate the device with a template. Although Cisco Configuration Engine has a default sample template (DemoRouter.cfgtpl) already created, it is very unlikely that your device will be configured using DemoRouter.cfgtpl. Therefore, create a new template.
2. If **Create Device** is performed after configuring a template for **router-c3460**, then Cisco Configuration Engine will not discover this router (you will not see an icon for **router-c3460** when Discover Device is selected). If you want Cisco Configuration Engine to discover the device then create only a template for the device—DO NOT use the **Create Device** operation. If you use **Create Device**, and you go to **Discover Device**, you will not see an icon for **router-c3460**. However, in either case, **View Device** should show an icon for **router-c3460**.
3. The Cisco Configuration Engine host uses odd numbered event ports for messages sent in plain text. For example, the default Cisco Configuration Engine setting is **5** event gateway ports without crypto enabled. Devices use ports 11013, 11015, 11017, 11019, 11021 depending on what you configured on the device (for **cns event 10.1.2.3 11013** this means event gateway port 11013 is used by **router-c3640** to communicate with the Cisco Configuration Engine host, 10.1.2.3).
4. The Cisco Configuration Engine host uses even numbered event ports for message sent encrypted starting with 11014. For example, if you set the number of event gateways to **2** during setup, then ports 11014 and 11016 would be available for use by a device.

Note

- The ports for Event Gateways with crypto operation are even numbers that start from 11012.
- The ports for Event Gateways with plaintext operation are odd numbers that start from 11011.

Editing Devices

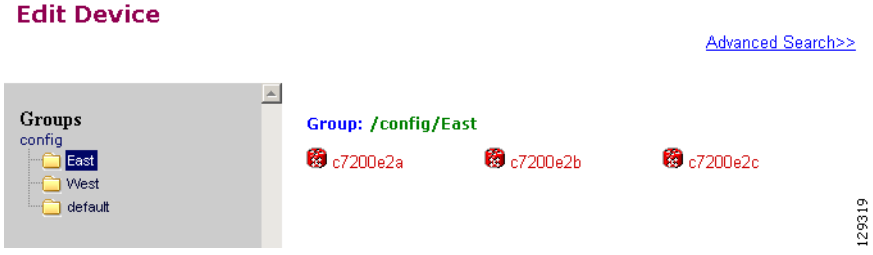
Step 1 From the Devices Functional Overview page, click **Edit Device**.

The Groups list appears.

Step 2 From the Groups list, select the group that holds the device in question.

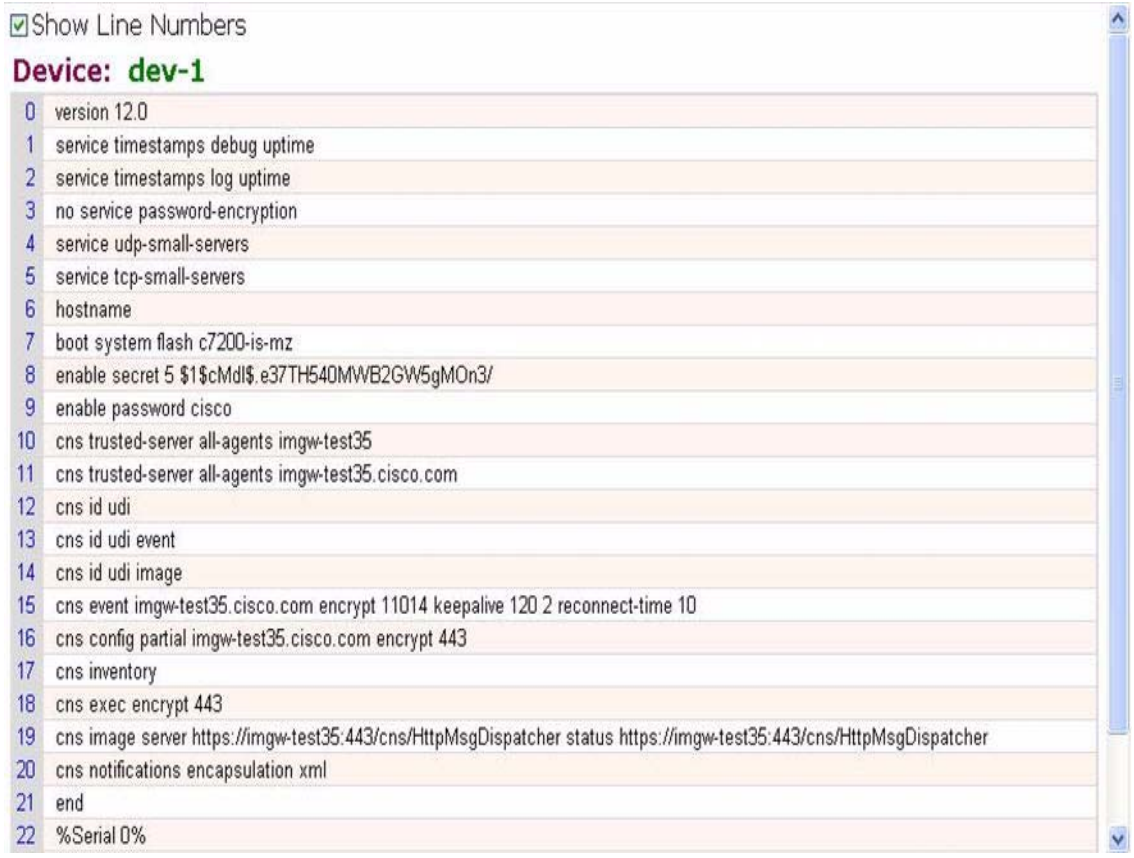
The Edit Device list appears (see Figure 3-24).

Figure 3-24 Edit Device List



Step 3 Click on the icon for the device you want to edit. The device configuration appears (see Figure 3-25).

Figure 3-25 Device Configuration



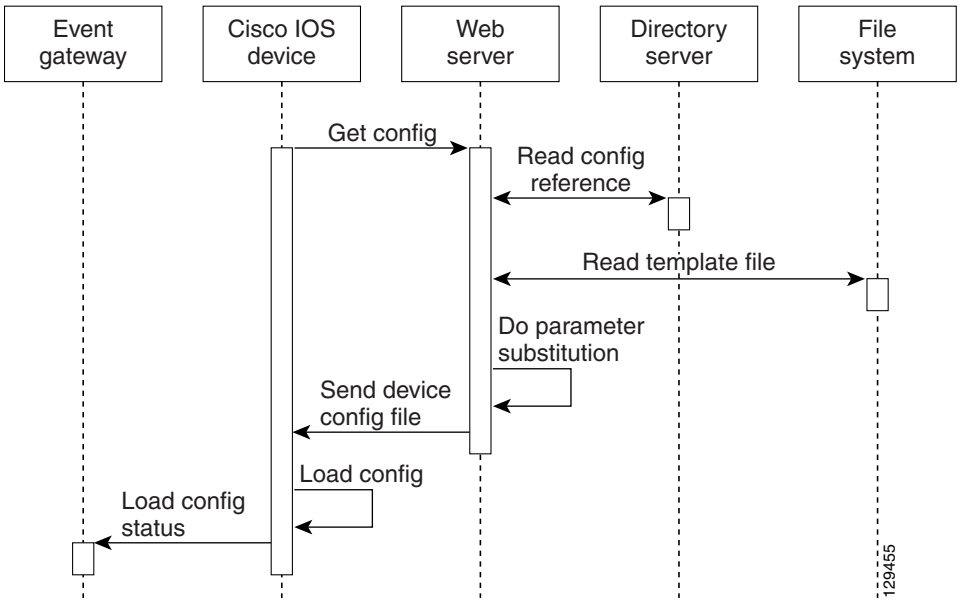
Step 4 From the left navigation pane, choose the edit function you want to use.

Editing Non-agent Enabled Device Information

Step 1 From the Edit Device page, click **Edit Information**.

The device information editor page appears (see Figure 3-26).

Figure 3-26 Non-agent Device Information Editor

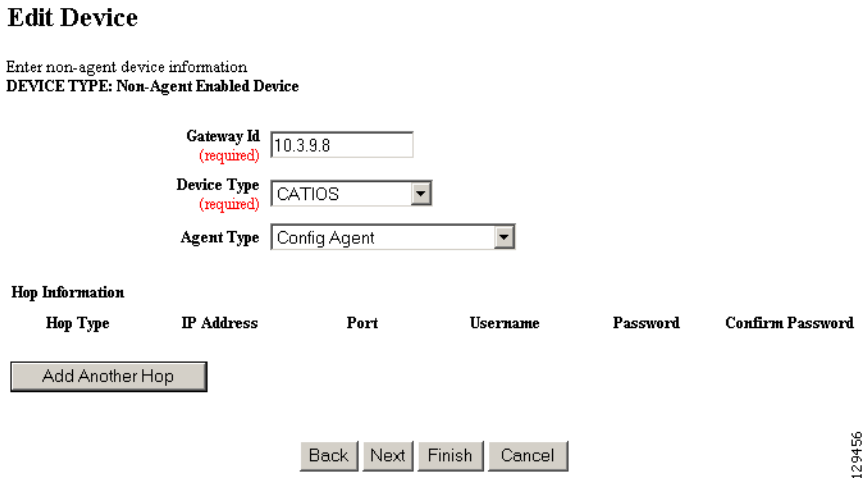


Step 2 To modify the device name, enter a valid value (no spaces) in the **Device Name** field, then click **Next**.

Step 3 Select Group Membership, then click **Next**.

The Non-agent Edit Device Information page appears (see Figure 3-27).

Figure 3-27 Non-agent Information Page

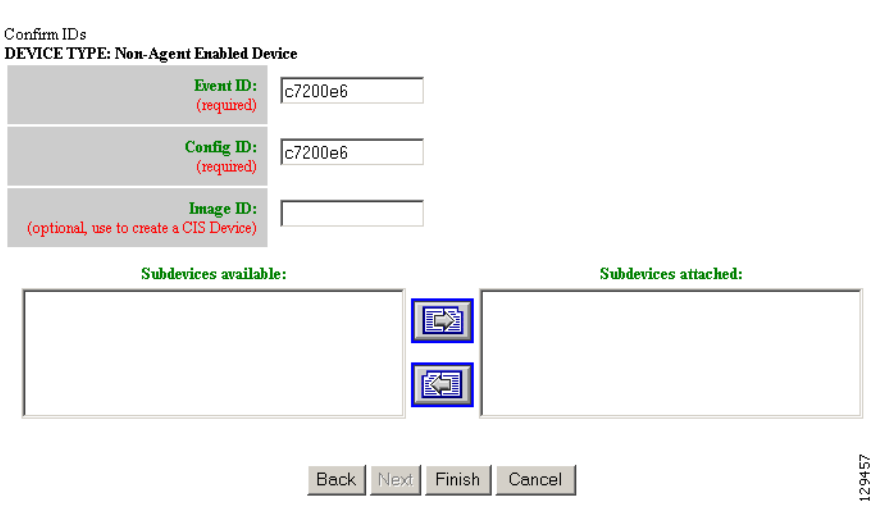


Step 4 Edit all appropriate fields, then to end this task, click **Finish**.

Step 5 To continue, click **Next**.

The device IDs page appears (see Figure 3-28).

Figure 3-28 Edit Non-agent Device IDs Page



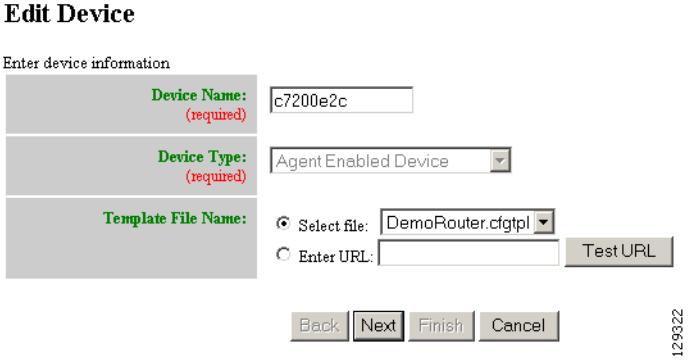
Step 6 Modify devices IDs as required, then click **Finish**.

Editing Agent Enabled Device Information

Step 1 From the Edit Device page, click **Edit Information**.

The device information editor page appears (see Figure 3-29).

Figure 3-29 Agent Enabled Device Information Page

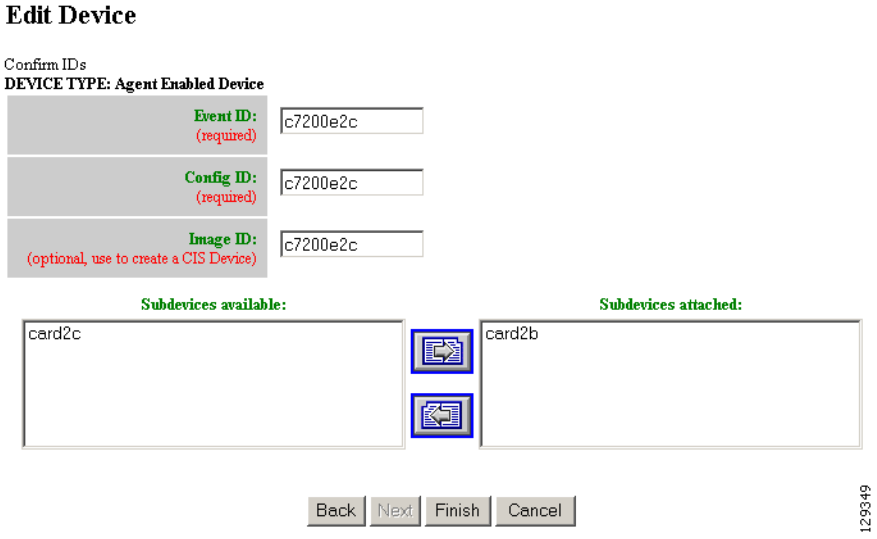


Step 2 To modify the device name, enter a valid value (no spaces) in the **Device Name** field, then click **Next**.

Step 3 Select Group Membership, then click **Next**.

The device IDs page appears (see Figure 3-30).

Figure 3-30 Agent enabled Device IDs Page



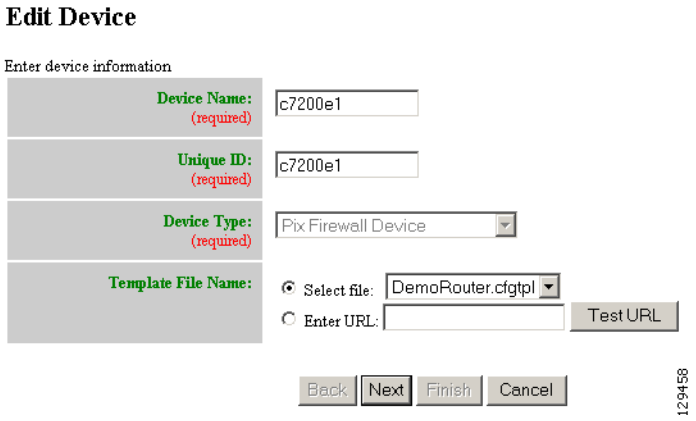
Step 4 Modify device IDs as required, then click **Finish**.

Editing PIX Device Information

Step 1 From the Edit Device page, click **Edit Information**.

The device information editor page appears (see Figure 3-31).

Figure 3-31 PIX Device Information Page

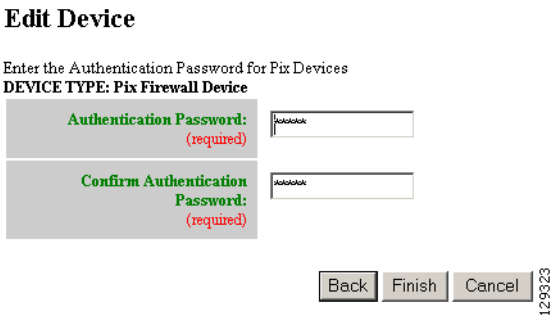


Step 2 To modify the device name and Image ID, if applicable, then click **Next**.

Step 3 Select Group Membership, then click **Next**.

The PIX Device Authentication Password page appears, see Figure 3-32.

Figure 3-32 PIX Device Authentication Password



Step 4 Modify the authentication password if required, then click **Finish**.

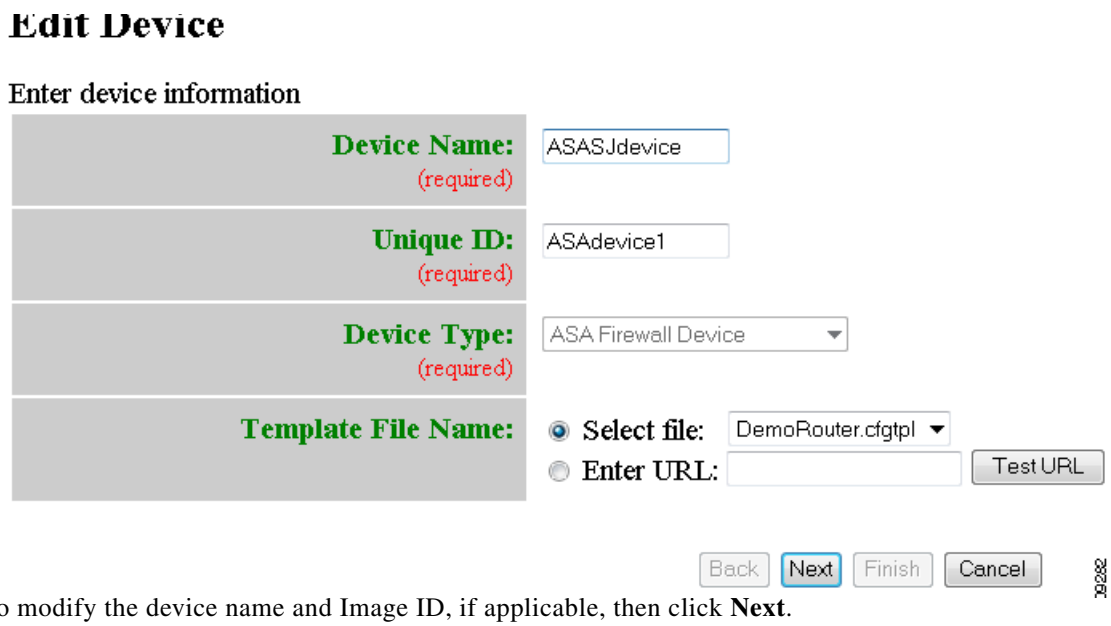
A case-sensitive password of up to 16 alphanumeric and special characters. Any character can be used in the password except a question mark and a space.

Editing ASA Device Information

Step 1 From the Edit Device page, click **Edit Information**.

The device information editor page appears (see Figure 3-33).

Figure 3-33 ASA Device Information Page

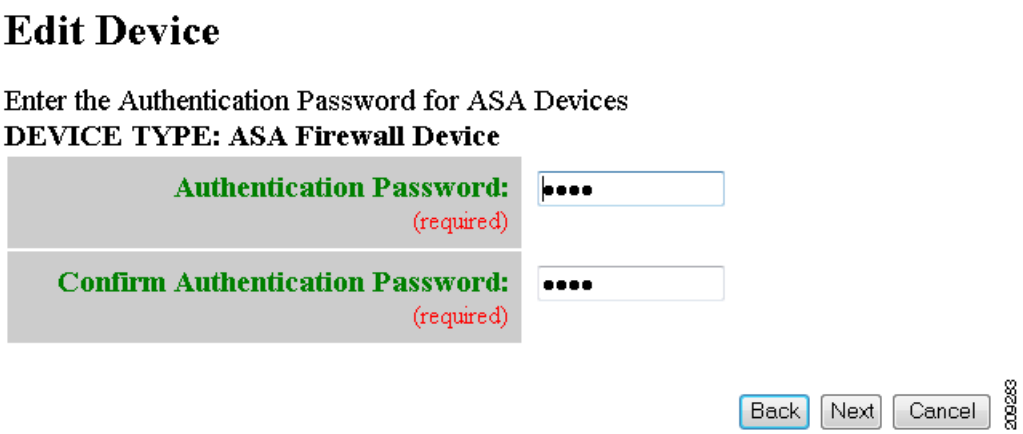


Step 2 To modify the device name and Image ID, if applicable, then click **Next**.

Step 3 Select Group Membership, then click **Next**.

The ASA Device Authentication Password page appears, see Figure 3-34.

Figure 3-34 ASA Device Authentication Password



Step 4 Modify the authentication password if required, then click **Finish**.

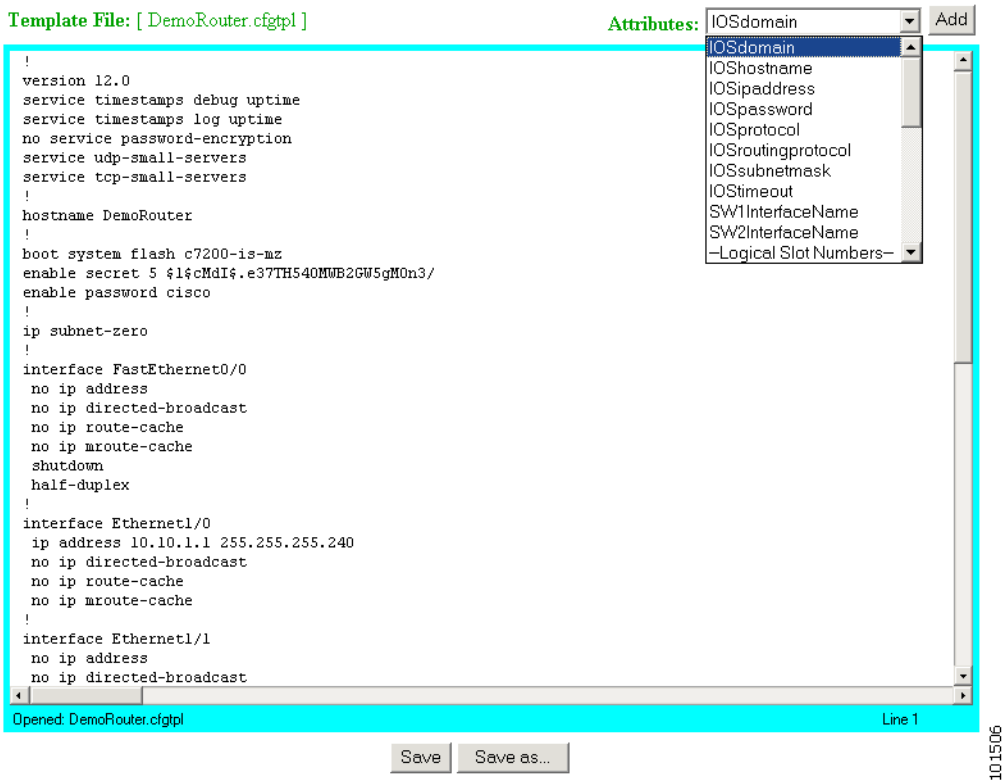
A case-sensitive password of up to 16 alphanumeric and special characters. Any character can be used in the password except a question mark and a space.

Editing Device Templates

Step 1 From the Edit Device page, click **Edit Template**.

The template editor appears (see Figure 3-35).

Figure 3-35 Template Editor



Step 2 In the **Attributes** field, click the drop-down arrow.

Step 3 Choose the attribute you want to add to the template, then click **Add**.

Step 4 Repeat Steps 2 and 3 for all attributes you want to add to the template file.

Step 5 Delete all unusable strings from the template file.

Step 6 Edit strings as necessary.

The default multi-line begin and end tags are **^C** and **^C** respectively. The delimiter for these tags are: ~ ! @ ^ & * - = |. Do not use # or %.

For example, a multi-line test banner might be:

```
banner exec ^C
    This is a Test Banner
    1. Hi
    2. Hello
    3. Test is 1234567890
^C
```

Step 7 To save your edits, click **Save**.

Step 8 To save this version as a new template, click **Save as**.

Editing Device Parameters

Step 1 From the Edit Device page:

a. If you have administrator-level access click **Edit Parameter-admin**.

b. To use Operator-level access click **Edit Parameter-operator**.

The parameters editor appears.

Step 2 Edit all active lines as required.

Step 3 To save your edits, click **Save Parameters**.

Editing Contact Information

Step 1 From the Edit Device page, click **Edit ContactInfo**.

The contact information appears.

Step 2 Edit all active fields as required.

Step 3 To clear your entries, click **Reset**.

Step 4 To save your edits, click **Update**.

Editing Subdevices

For complete information about working with subdevices, including editing (except PIX devices), see "Working with Subdevices" section on page 3-71.

Editing Image Association Information

Step 1 From the Edit Device page, click **Edit Images**.

The Edit Device Image page appears.

Step 2 Edit image and configuration information as required.

Step 3 To revert to the previous state, click **Cancel**.

Step 4 To complete this task, click **Finish**.

Resynchronizing Devices

If the password of a device becomes corrupted so that there is a mismatch between the device and the corresponding password information help in the directory, you can resynchronize the device with the Cisco Configuration Engine by using the Resync Device function.

Step 1 From the Devices Functional Overview page, click **Resync Device**.

Step 2 From the Resync Device page, click on the icon for the device you want to re-synchronize.

Note PIX devices will not be visible on this page.

Step 3 In the confirmation window that appears, click **Ok**.

Cloning Devices

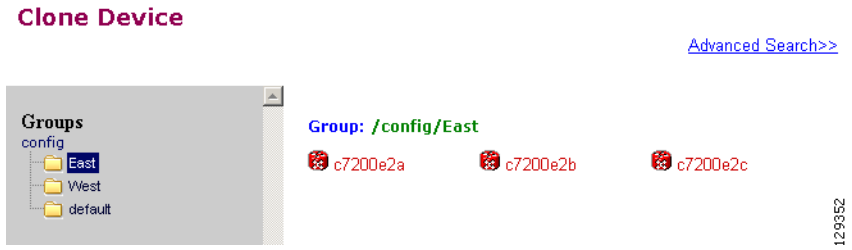
Step 1 From the Devices Functional Overview page, click **Clone Device**.

The Groups list appears.

Step 2 From the Groups list, select the group that holds the device you want to clone.

The Clone Device list appears (see Figure 3-36).

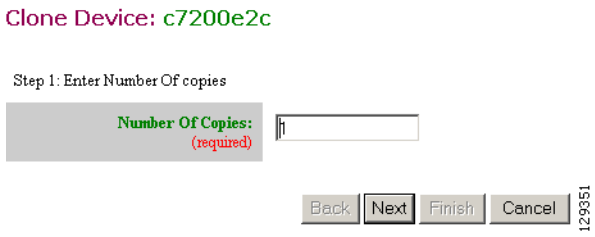
Figure 3-36 Clone Device List



Step 3 Select a device to clone.

The Step 1 page appears (see Figure 3-37).

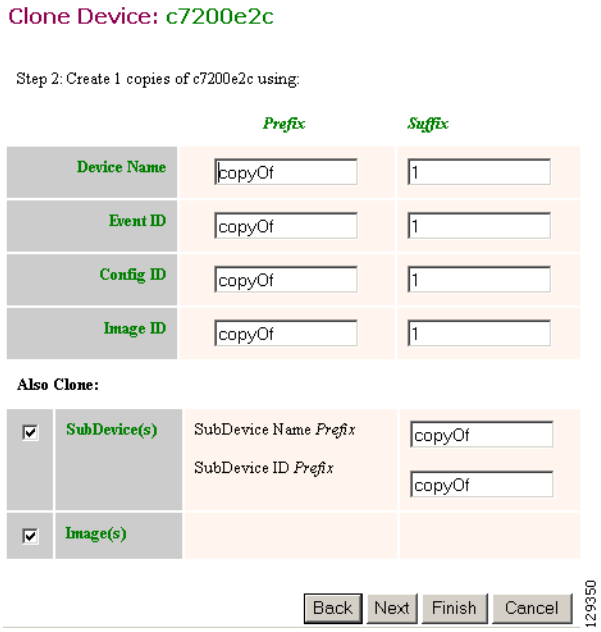
Figure 3-37 Clone Device > Number of Copies



Step 4 Determine the number of copies, then click **Next**.

The Step 2 page appears (see Figure 3-38).

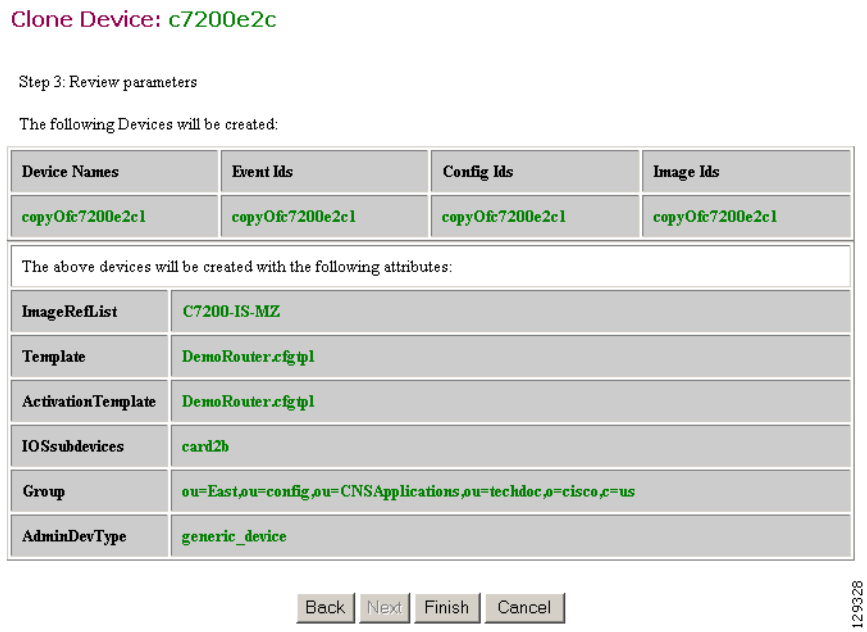
Figure 3-38 Clone Device > Name and IDs



Step 5 Enter prefix and suffix for each device copy, then click **Next**.

The Step 3 page appears (see Figure 3-39).

Figure 3-39 Clone Device > Review Parameters



Step 6 Review the parameters you set for this clone.

Step 7 If you want to make changes, click **Back**.

Step 8 To finish this task, click **Finish**.

Deleting Devices

Step 1 From the Devices Functional Overview page, click **Delete Device**.

The Groups list appears.

Step 2 From the Groups list, select the group that holds the device you want to delete.

The device list appears.

Step 3 Click the check box for the device(s) you want to delete.

Step 4 Click **Submit**.

A list of devices selected for deletion appears.

Step 5 To continue, click **Delete**.

Updating Device Configurations and Images

To send an updated version of the configuration or a new image to a device, from the Devices Functional Overview page, click **Update Device**. The Update Device Functional Overview page appears showing:

- Update Configuration
- Update Image
- Customize

Updating Device Configurations

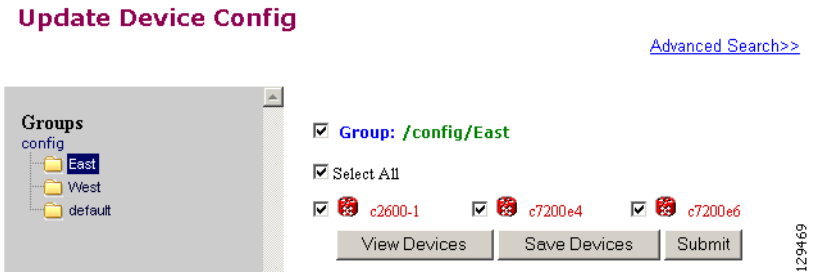
Step 1 From the Update Devices Functional Overview page, click **Update Config**.

The Groups list appears.

Step 2 From the Groups list, select the group that holds the device you want to update.

Step 3 Click the check box next to the icon for the device(s) you want to update (see Figure 3-40).

Figure 3-40 Update Config Group/Device Selection Page

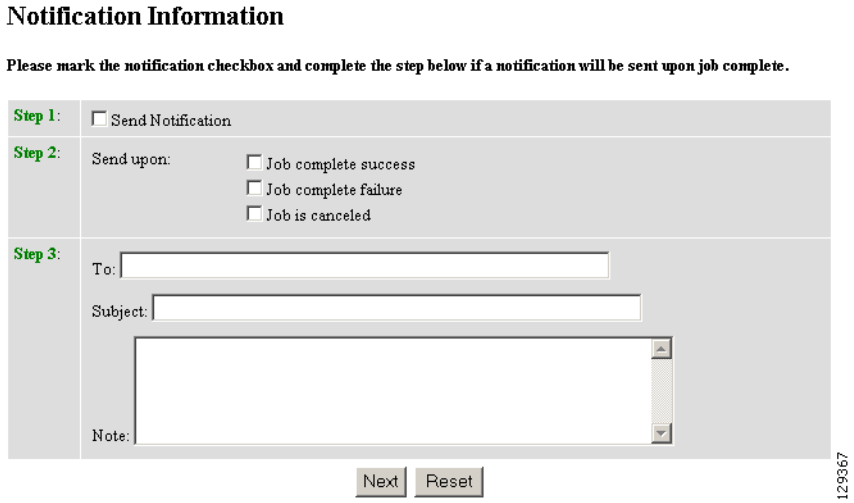


Note PIX devices will not be visible on this page.

Step 4 Click **Submit**.

The update notification page appears (see Figure 3-41).

Figure 3-41 Update Configuration Notification Information

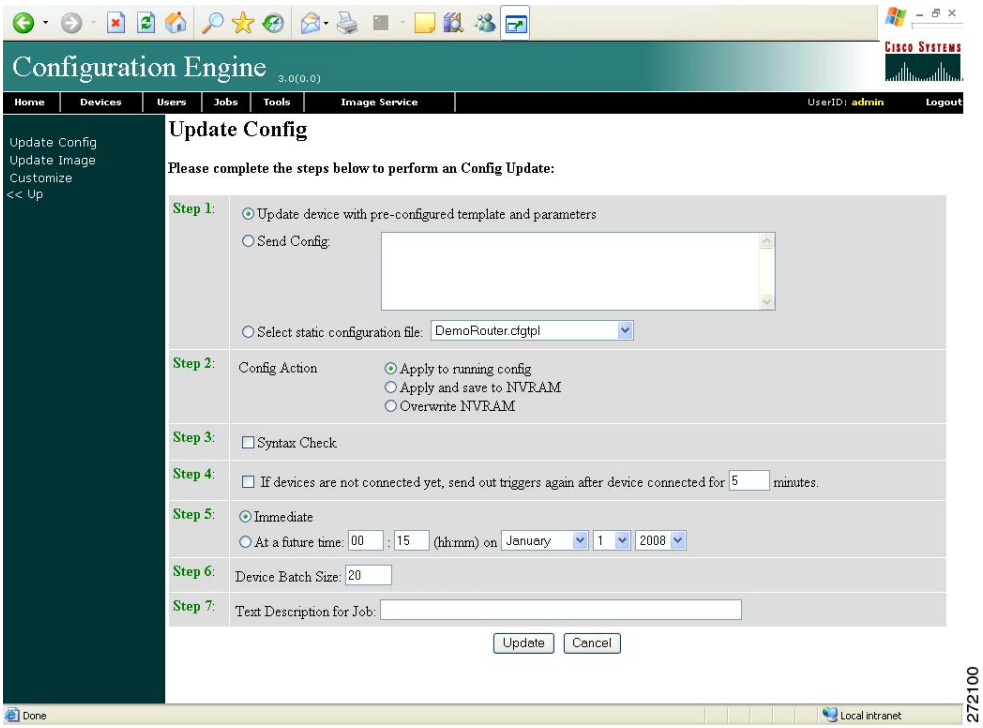


Step 5 If you want an email notification sent when the update job completes, fill in the information on this page, then click **Next**.

Note This page is optional. You can skip to the next page by clicking **Next**.

The update task dialog box appears (see Figure 3-42).

Figure 3-42 Update Task



Step 6 For Step 1, select the source of the configuration.

Step 7 For Step 2, choose the **Config Action** task you require.

- Apply to running config – applies the configuration to the current running configuration.
- Apply and save to NVRAM – applies the configuration without causing it to persist in NVRAM.
- Overwrite NVRAM – applies the change and causes it to persists in NVRAM.

Step 8 For Step 3, if required, check the **Syntax Check** check box.

Step 9 For Step 4, if devices are not connected, check this check box to send out triggers.

Step 10 For Step 5, select the date and time to send the configuration update.

Step 11 For Step 6, determine the batch size.

Tip The max batch size for IMGW should be set at 25.

Step 12 For Step 7, if applicable, enter a description for this update job.

Step 13 Click **Update**.

Updating Device Images

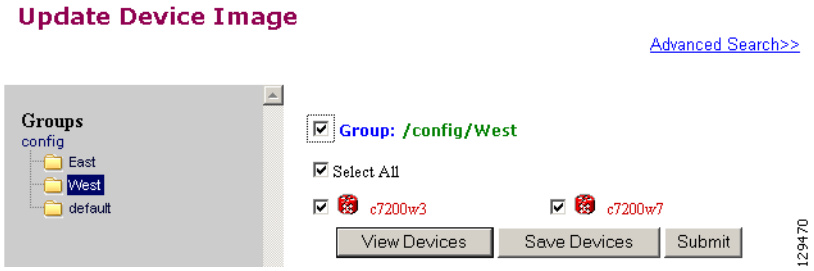
Step 1 From the Update Device Functional Overview page, click **Update Image**.

The Groups list appears.

Step 2 From the Groups list, select the group that holds the device you want to update.

Step 3 Click the check box next to the icon for the device(s) you want to update (see Figure 3-43).

Figure 3-43 Update Image Group/Device Selection Page



Note PIX/ASA devices will not be visible on this page.

Step 4 Click **Submit**.

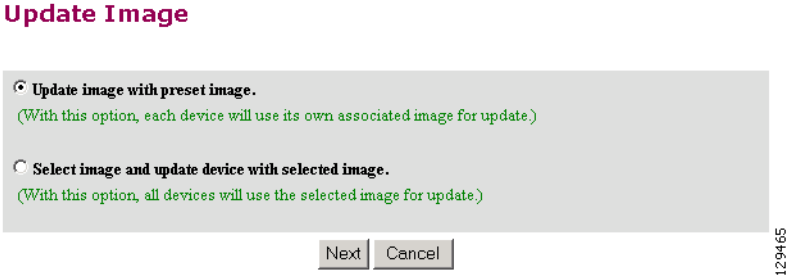
The update notification page appears (see Figure 3-41).

Step 5 If you want a notification sent when the update job completes, fill in the information on this page, then click **Next**.

Note This page is optional. You can skip to the next page by clicking **Next**.

The Update Image page appears (see Figure 3-44).

Figure 3-44 Image Selection Page

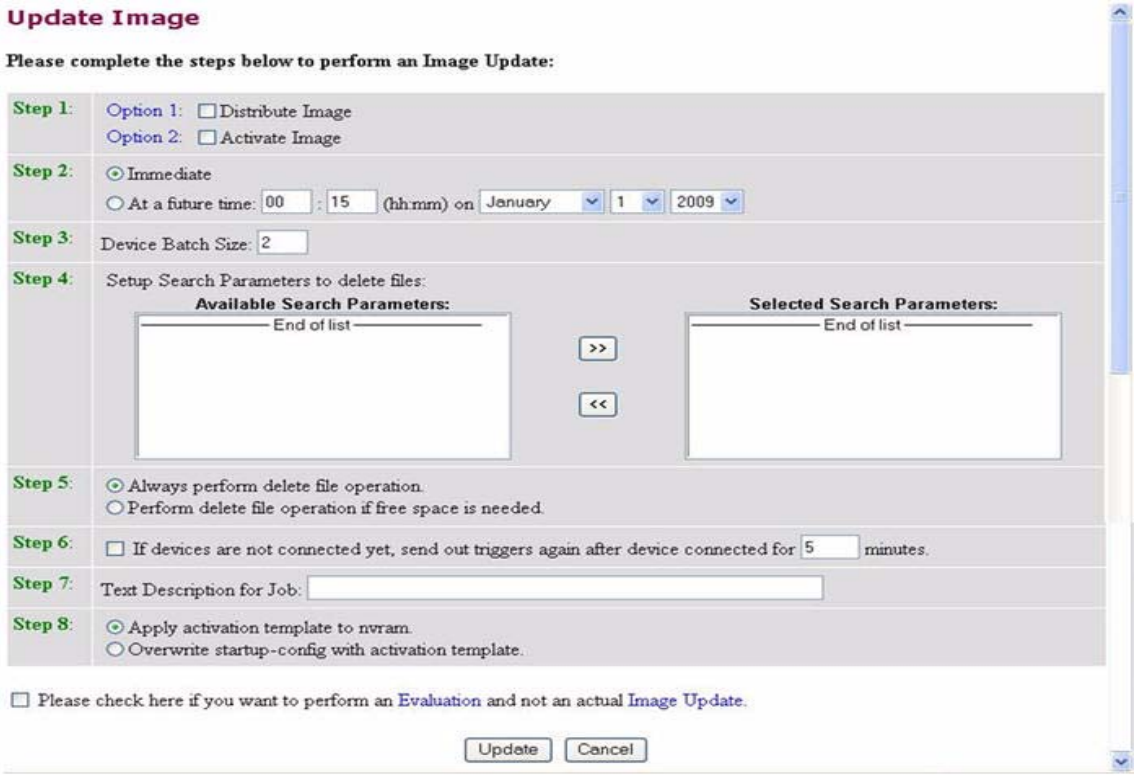


Step 6 Select the image you want to use for updates, then click **Next**.

If you select to update the device by selecting an image other than its present image, the next page gives you a list of images from which to select.

The Update Image worksheet appears (see Figure 3-45).

Figure 3-45 Update Image Worksheet



Step 7 To distribute the image, click the check box for **Distribute Image**.

Step 8 To activate the image, click the check box for **Activate Image**.

Tip All three agents (event, partial config, and image) must be running on the device for the activation process to succeed.

Note For the image to become active on the device, you must have a Configuration Control template associated with this device that contains the CLI commands for image activation (see "Configuration Control Templates" section on page 12-127).

Step 9 To update the image immediately, click the radio button for **Immediate**.

Step 10 To update the image at a specified time in the future, click the radio button for **At a future time**:

a. Enter a time value.

b. Enter a date value.

Step 11 Set the **Device Batch Size**.

This is the number of concurrent image updates. This feature allows you to limit the number of concurrent requests to a server. When one batch of image update requests has been satisfied, the next batch starts.

Tip The max batch size for IMGW should be set at 25. And for HTTP only (no event agent) mode, the batch size must be same as the number devices in the submitted job.

Note If you are running a device image update session to a mix of IMGW and agent devices, the effective device batch size limit for IMGW devices—concurrent Telnet session limit—is equal to the value (default = 25) set for this attribute in the **Setup** program (see *Cisco Configuration Engine Installation and Configuration Guide*).

Step 12 If applicable, enter a text description of the job.

Step 13 To perform an evaluation rather than an actual update, click the check box at the bottom of this pane.

Step 14 To continue, complete the steps called for, then click **Update.**

The Update Image Status page appears (see Figure 3-46). You can use this Job ID to perform job-related tasks (see Chapter 5, "Configuration and Image Update Jobs Manager").

Figure 3-46 Job ID for Update Image

Update Image Status

Device Name	Distributed Image(s)	Activated Image(s)
Device2	image3 image2	image2

Your request has been assigned the job id: 1062710890226

101509

Customize Job Template

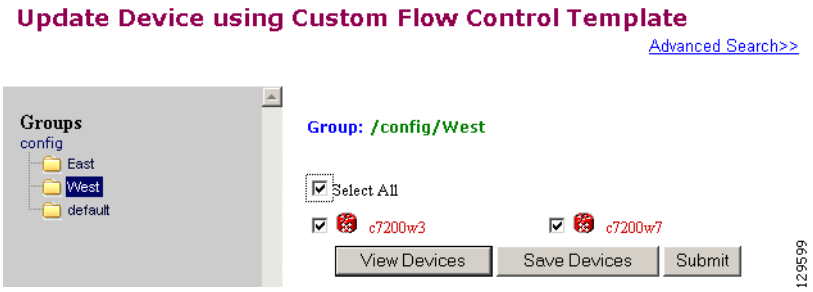
Step 1 From the Update Device Functional Overview page, click **Customize**.

The Groups list appears.

Step 2 From the Groups list, select the group that holds the device you want to update.

Step 3 Click the check box next to the icon for the device(s) you want to update (see Figure 3-47).

Figure 3-47 Custom Flow Control Device Update Selection Page

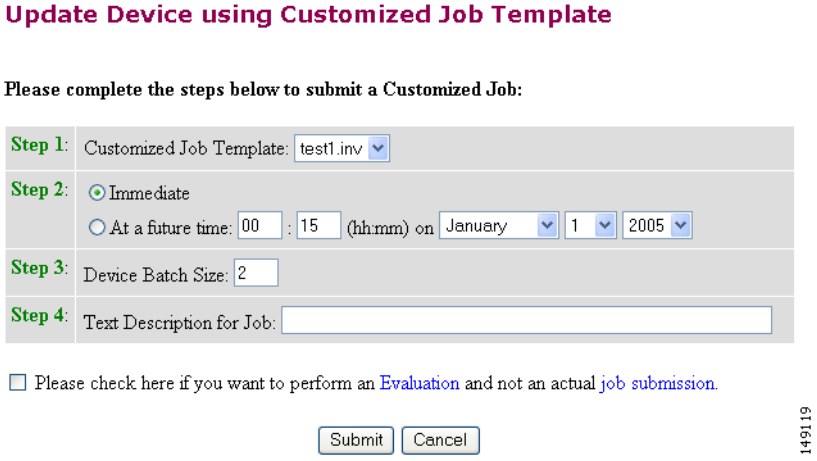


Note PIX devices will not be visible on this page.

Step 4 Click **Submit**.

The Update Device using Customized Job Template appears (see Figure 3-48).

Figure 3-48 Customized Job Template Form



Step 5 Complete the Customized Job Template form, then click **Submit**.

The next page shows the Job ID for this update task.

Step 6 To check the status of this job go to **Jobs > Query Jobs**, then click on the Job ID for this Job.

Configuration Control Template

To restart a device with a new image, you must issue the CLI commands that you would normally enter from the device console to activate a new image.

For example, if you want to restart a Cisco 3600 Series router with an image named *3600.image*, from the device console, you would issue the following CLI commands:

no boot system
boot system flash:3600.image

you must provide the device with a Configuration Control template that contains the required CLI commands for image activation.

If you do not have such a template, see "Adding a Template" section on page 12-138. Also, you must associate this Configuration Control template with the particular device (see "Adding Devices" section on page 3-31).

The content of the Configuration Control template for image activation should contain the CLI commands that you would normally enter from the device console to activate a new image on the device.

Working with Subdevices

A subdevice is a configuration object for network modules in a modular router. When working with subdevices, it is very important to pick the correct type of interface card or module.

Note PIX Firewall devices do not have subdevices.

To work with subdevices, from the Devices Functional Overview page, click **Subdevices**.

The Subdevices Functional Overview page appears showing:

- View Subdevice
- Add Subdevice
- Edit Subdevice
- Clone Subdevice
- Delete Subdevice

Viewing Subdevices

Step 1 From the Subdevices Functional Overview page, select **View Subdevice**.

The list of subdevices appears (see Figure 3-49).

Figure 3-49 View Subdevice

Step 2 Click on the icon for the device configuration you want to view.

The Configuration for that device appears.

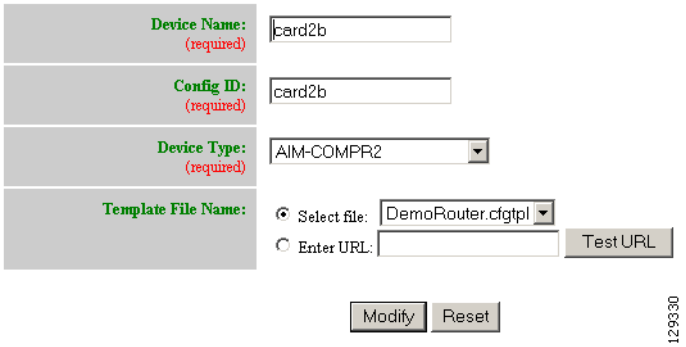
Note The subdevice configuration displayed is the configuration as it appears at the configuration server. It might not be the configuration running on the subdevice.

Adding Subdevices

Step 1 From the Subdevices Functional Overview page, click **Add Subdevice**.

The Subdevice Information page appears (see Figure 3-50).

Figure 3-50 Subdevice Information Page



Step 2 Enter a valid value (no spaces) in the **Device Name** field.

Table 3-23 shows valid values for this task.

Table 3-23 Valid Values for Add Subdevice

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)
ConfigID	Configuration ID attribute of the device.	a-z A-Z 0-9 -(hyphen) _ (under-score) . (period)

Table 3-23 Valid Values for Add Subdevice (continued)

Attribute	Description	Valid Values
Device Type		From drop-down list
Template File Name	Name of the configuration template to associate with the device.	From drop-down list, or user-defined

Step 3 Accept the default value that appears or enter another valid value (no spaces) in the **Config ID** field.

Step 4 From the **Device Type** drop-down list, choose the type of device to which this subdevice is associated.

Device type is the name of the network module as defined in the Cisco product catalog (price list).

Step 5 Choose a template file.

To use a template on your Cisco Configuration Engine:

a. Choose **Select file**.

b. Use the drop-down list to choose a template.

OR

To use an external template:

a. Choose **Enter URL**.

b. Enter the full URL for the server, directory, and filename where the template is stored. Currently, only **http** is supported.

c. To test access to the external template, click **Test URL**.

If the server is unavailable or the external template cannot be accessed, an error appears. You can still save this logical subdevice, but the template is not available until you have access to the external template.

Step 6 To clear your entries, click **Reset**.

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

Editing Subdevices

Step 1 From the Subdevices Functional Overview page, click **Edit Subdevice**.

Step 2 From the Edit Subdevice page, click on the icon for the subdevice you want to edit.

The subdevice configuration appears with a menu of edit functions in the left navigation pane:

- Edit Information
- Edit Template
- Edit Parameter-Admin – Administrator-level view
- Edit Parameter-Operator – Operator-level view; used by Administrator to verify what Operator can see after Administrator has used **Edit > AttributInfo** under the Template Manager
- Edit ContactInfo

Step 3 From the left navigation pane, choose the edit function you want to use.

Editing Subdevice Information

Step 1 From the Edit Subdevice page, click **Edit Information**.

The subdevice information editor dialog box appears (see Figure 3-50).

Step 2 Modify all applicable fields.

For valid values, see Table 3-23.

Step 3 To clear your entries, click **Reset**.

Step 4 To update device information, click **Modify**.

Editing Subdevice Template

Step 1 From the Edit Subdevice left navigation pane, click **Edit Template**.

The template editor appears.

Step 2 In the **Attributes** field, click the drop-down arrow.

Step 3 Choose the attribute you want to add to the template, then click **Add**.

Step 4 Repeat Steps 2 and 3 for all attributes you want to add to the template file.

Step 5 Delete all unusable strings from the template file.

Step 6 Edit strings as necessary.

The default multi-line begin and end tags are **^C** and **^C** respectively. The delimiter for these tags are: ~ ! @ ^ & * - = |. Do not use # or %.

A multi-line test banner might be:

```
banner exec ^C
    This is a Test Banner
    1. Hi
    2. Hello
    3. Test is 1234567890
^C
```

Step 7 To save your edits, click **Save**.

Step 8 To save this version as a new template, click **Save as**.

Editing Subdevice Parameters

Step 1 From the Edit Subdevice left navigation pane, click **Edit Parameter-Admin**.

The parameters editor appears.

Note Operator-level privileges do not include access to these parameters.

Step 2 Modify parameters values as required.

Step 3 To save your edits, click **Save Parameters**.

Editing Contact Information

Step 1 From the Edit Device left navigation pane, click **Edit ContactInfo**.

The contact information appears.

Step 2 Edit all active fields as required.

Step 3 To clear your entries, click **Reset**.

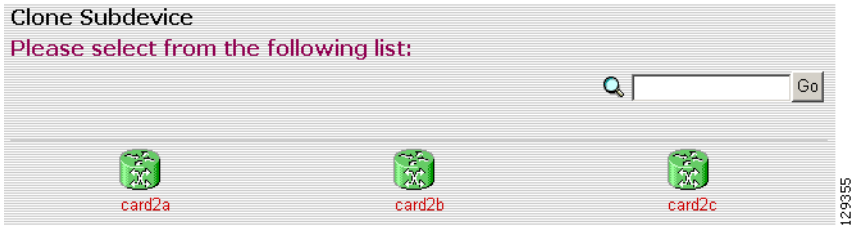
Step 4 To save your edits, click **Update**.

Cloning Subdevices

Step 1 From the Subdevices Functional Overview page, click **Clone Subdevice**.

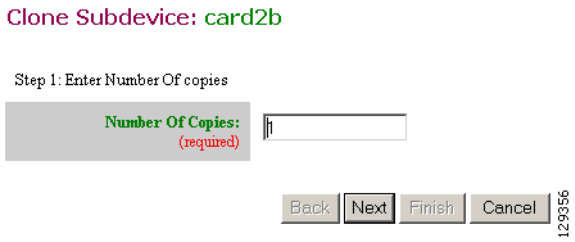
The Subdevice list appears (see Figure 3-51).

Figure 3-51 Clone Subdevice Device List



Step 2 The Step 1 page appears (see Figure 3-52).

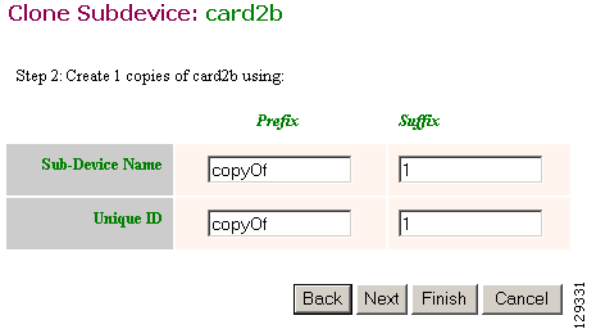
Figure 3-52 Clone Subdevice > Number of Copies



Enter the number of copies you want to make, then click **Next**.

The Step 2 page appears (see Figure 3-53).

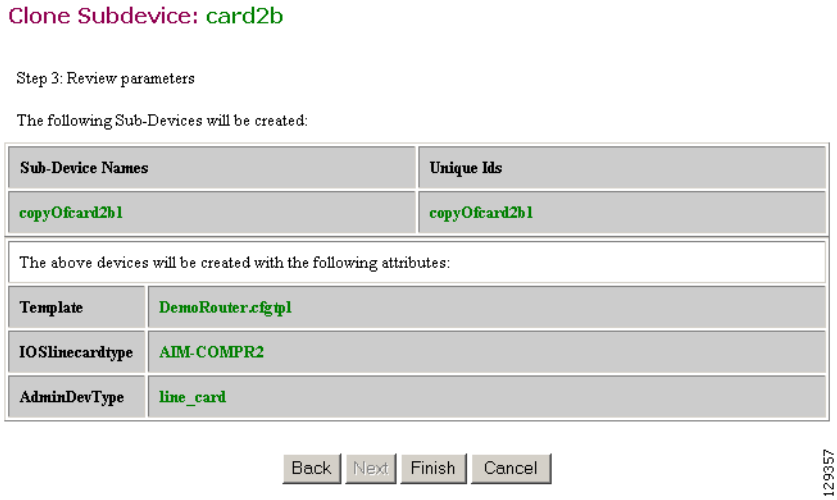
Figure 3-53 Clone Subdevice > Name and IDs



Step 3 Enter prefix and suffix for each device copy, click **Next**.

The Step 3 page appears (see Figure 3-54).

Figure 3-54 Clone Subdevice > Review Parameters



Step 4 Review the parameters you set for this clone.

Step 5 If you want to make changes, click **Back**.

Step 6 To finish this task, click **Finish**.

Deleting Subdevices

Step 1 From the Subdevices Functional Overview page, click **Delete Device**.

The Delete Subdevice page appears (see Figure 3-55).

Figure 3-55 Select Subdevices to Delete

Step 2 Check to select the subdevice(s) you want to delete.

Step 3 To proceed, click **Next**.

A status page appears indicating that the subdevice has been selected for deletion (see Figure 3-56).

Figure 3-56 Delete Subdevices Confirmation

Step 4 To delete this subdevice, click **Delete**.

Querying Device Inventory

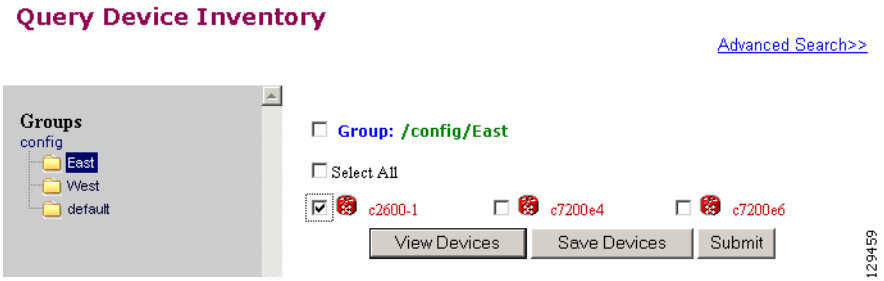
You can use the Query Device Inventory feature to get a reports from devices about:

- Running image information
- Hardware information
- File system list

Step 1 From the Devices Functional Overview page, click **Query Device Inventory**.

The Query Device Inventory screen appears.

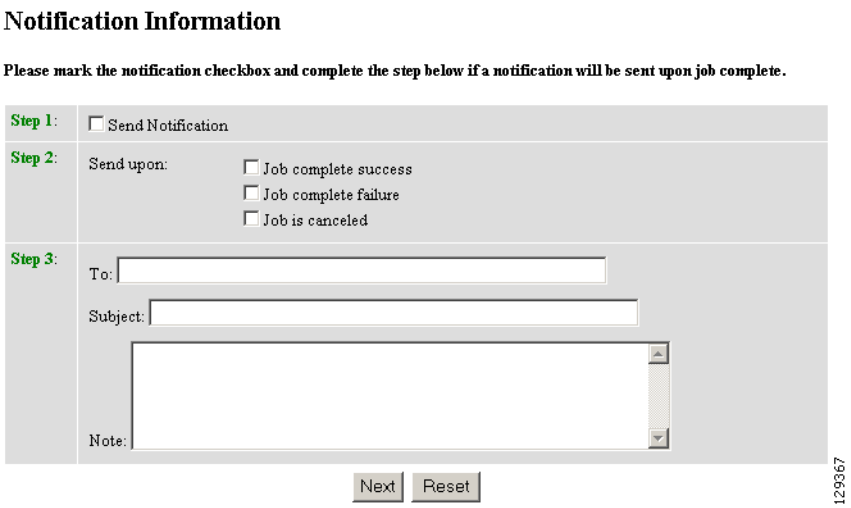
Figure 3-57 Query Device Inventory Page



Step 2 Check the device(s) for which you want to get an inventory report(s), then click **Submit**.

The Query Notification Information page appears (see Figure 3-58).

Figure 3-58 Query Notification Information Page

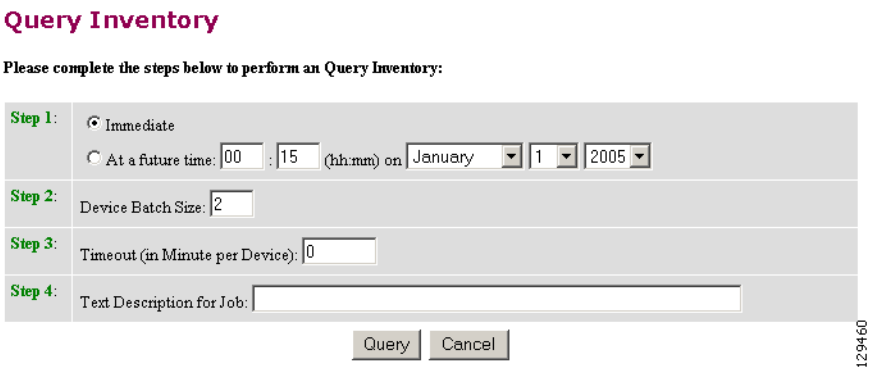


Step 3 If you want an email notification sent when the query completes, fill in the information on this page, then click **Next**.

Note This page is optional. You can continue by clicking **Next**.

The Query Attributes Page appears (see Figure 3-59).

Figure 3-59 Query Attributes Page.



Step 4 Set all applicable attributes, then click **Query**.

The query is submitted as a **Job**. A page appears indicating the job number for this query.

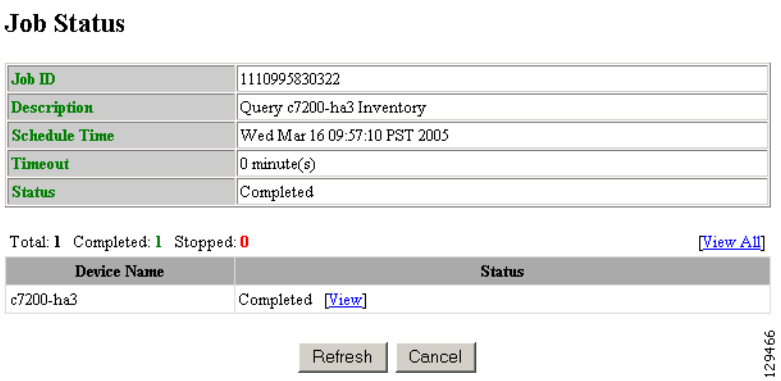
Step 5 To check the status of this job, go to **Jobs > Query Job**.

Step 6 Use the drop-down arrow to select Completed Jobs.

Step 7 For the Inventory Job you want, click either the job number or the entry in the Status column.

The Job Status page appears (see Figure 3-60).

Figure 3-60 Job Status Page



Step 8 To view the inventory report, click **View**.

Device inventory report appears (see Figure 3-61).

Figure 3-61 Sample Device Inventory Report

ImageID:c2600-1 Reported Time: 1993-03-05T22:57:37

Running Image Information					
Description (Version String)	12.2(12h)				
Image File	flash:c2600-ik8o3s-mz.122-12h	Image MD5			
Config Variable		Config Reg		Config Reg Next Boot	
Boot Variable		BootIdr Variable		Return To ROM Reason	reload
Return To ROM Time	2003-11-04T00:00:00	Started At	2003-11-04T00:00:00		

Hardware Information					
Vendor	cisco	Platform Name	2611	Hardware Revision	0x202
Processor Type		Main Mem Size	30649288	IO Mem Size	4194312
Hardware Serial #	JAB03170532	MidPlane Version			
Processor Rev					
Hardware Rework					

File System List	
	[FileSys name=[nvram:], type=[nvram], size=[29688], freespace=[26473], readable=[1],
	writeable=[1]
	Directory 0: name=[/], fullname=[nvram:/], size=[29688], readflag=[1],
	writeflag=[1], owner=[], modDate=[1969-12-31T00:00:00]
	File 0 under Directory[/]: name=[startup-config],
	fullname=[nvram:/startup-config],
	size=[1110], readflag=[1], writeflag=[1], owner=[],
	modDate=[1969-12-31T00:00:00],

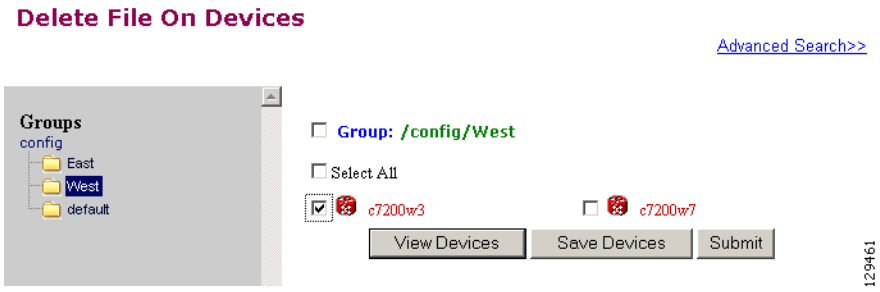
101485

Delete Files on Device

Step 1 From the Devices Functional Overview page, click **Delete Files on Device**.

The Delete File on Device page appears (see Figure 3-62).

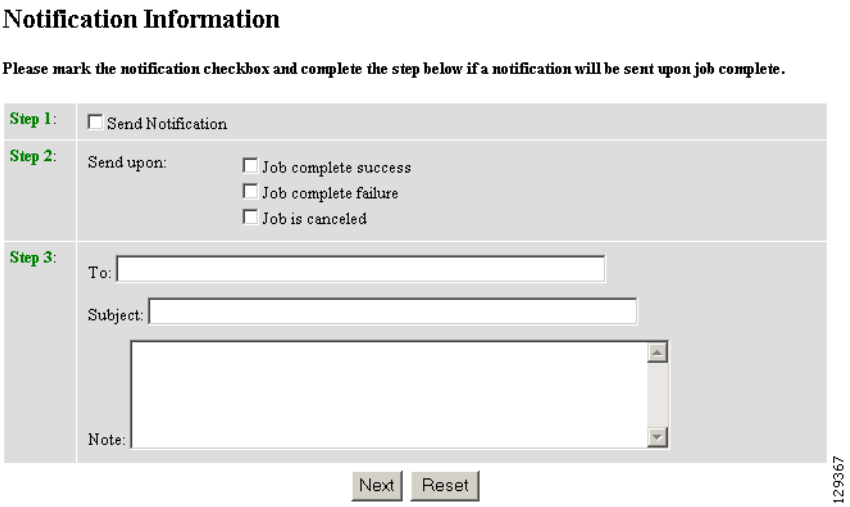
Figure 3-62 Delete Files on Device Page



Step 2 Check the device(s) on which you want to delete files, then click **Submit**.

The Delete Device Files Notification Information page appears (see Figure 3-63).

Figure 3-63 Delete Device Files Notification Information Page

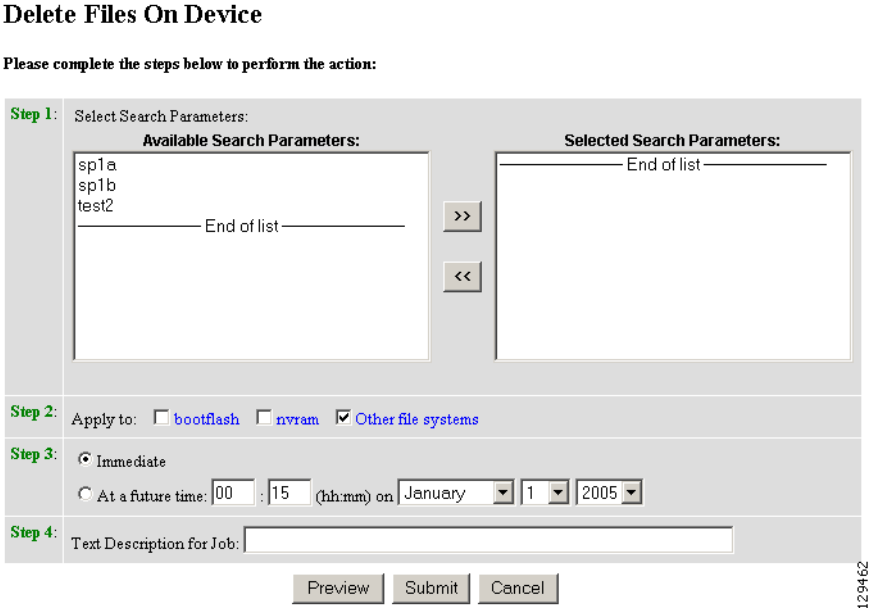


Step 3 If you want an email notification sent when the query completes, fill in the information on this page, then click **Next**.

This page is optional. You can continue by clicking **Next**.

The Delete Files parameter page appears (see Figure 3-64).

Figure 3-64 Delete Files Parameter Page



Step 4 Complete the steps on this page, then to preview, click **Preview**.

Step 5 When you are satisfied with the task parameters, click **Submit**.

Dynamic Operations

Dynamic Operations allows you to perform operations on devices that all respond to having the same attributes based on the Query used to find them.

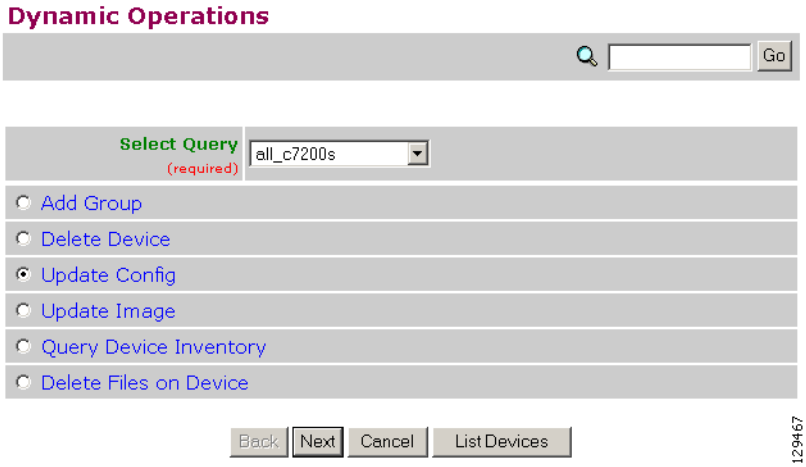
To use this feature you must have query objects available before starting Dynamic Operations. If no Queries have been created, you will see a message stating that there are no query objects available.

To create a Query, go to the "Creating Queries" section on page 8-108.

Step 1 From the Devices Functional Overview page, click **Dynamic Operations**.

The Dynamic Operations page appears (see Figure 3-65).

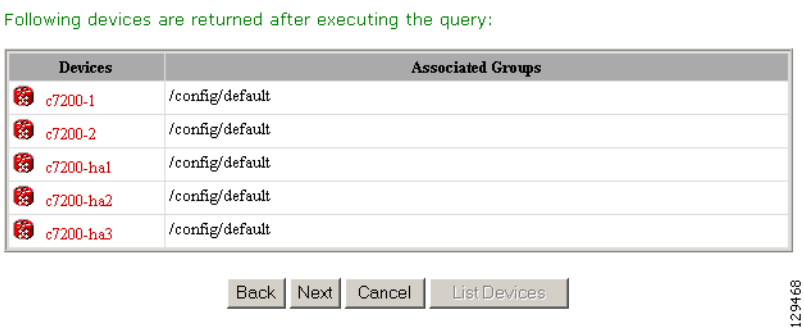
Figure 3-65 Dynamic Operations Page



Step 2 Use the down-arrow key to select the Query you want to use.

Step 3 Select the operation you want to perform on devices that respond to the Query, then click **List Devices**. The result of the Query appears (see Figure 3-66).

Figure 3-66 Devices Responding to Query



Step 4 To continue with the selected operation, click **Next**.