



Getting Started

This chapter discusses initial device configuration and basic ACNS network configuration for devices that make up an ACNS network. The following sections explain how to configure ACNS devices to operate and communicate in a centrally managed environment:

- [Overview, page 2-1](#)
- [Using the Quick Setup Method, page 2-7](#)
- [Initial Device Configuration Using the Standard CLI, page 2-13](#)
- [Initial Network Configuration Using the Standard Content Distribution Manager GUI, page 2-21](#)
- [Where to Go Next, page 2-24](#)

Overview

To get started, you must perform two kinds of initial configurations:

1. Device
2. Network

To configure initial device settings and network elements, you can choose between two configuration methods:

- Quick method
- Standard method

The first step in either method is to initially configure the devices. Initial device configuration requires the configuring of device network values, such as IP address, netmask, DNS host, and gateway IP address.

After your devices are up and running, you must register each device with a central management device, known as the Content Distribution Manager, to bring the device online in the Content Distribution Manager GUI. Devices can then be configured and managed from one central location through the Content Distribution Manager GUI.

Initial Device Configuration Overview

You must initially configure all of your ACNS devices before they can participate in the ACNS network. You can choose between three methods of initial device configuration:

- Autoregistration—Quick method

The autoregistration method performs the initial device configuration and network registration with the Content Distribution Manager automatically when the device is powered on for the first time. (See the [“Quick Device Configuration Using Autoregistration”](#) section on page 2-7.)

- Setup utility—Quick method

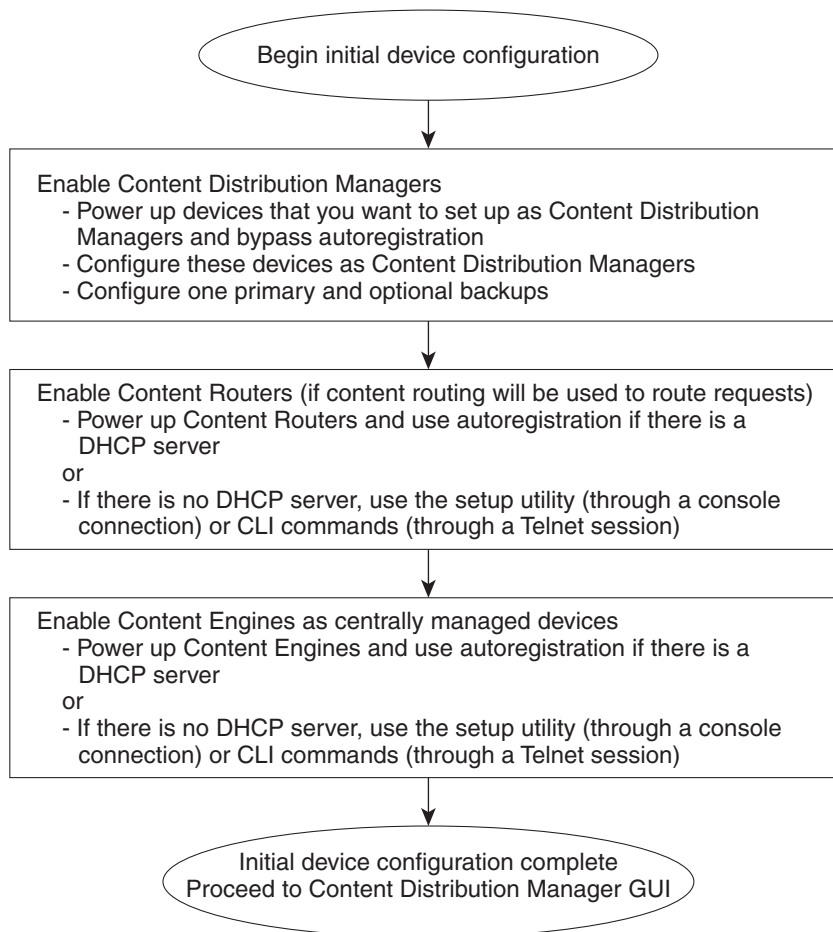
With the setup utility method, the administrator performs initial device configuration and network registration using the CLI-based interactive setup utility through a console connection. (See the [“Quick Device Configuration Using the Setup Utility”](#) section on page 2-9.)

- Command-line-interface—Standard method

Initial device configuration and network registration can also be performed using the standard command-line-interface (CLI) of the device. (See the [“Initial Device Configuration Using the Standard CLI”](#) section on page 2-13.)

Figure 2-1 shows the task flow for initially configuring devices.

Figure 2-1 *Initially Configuring Devices in a Centrally Managed ACNS Network*



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Initial Network Configuration Overview

After you have initially configured your ACNS devices, you must activate the devices and then configure a basic ACNS network. Device activation is done through the Content Distribution Manager GUI and allows only approved devices to participate in the ACNS network and communicate with other activated nodes.

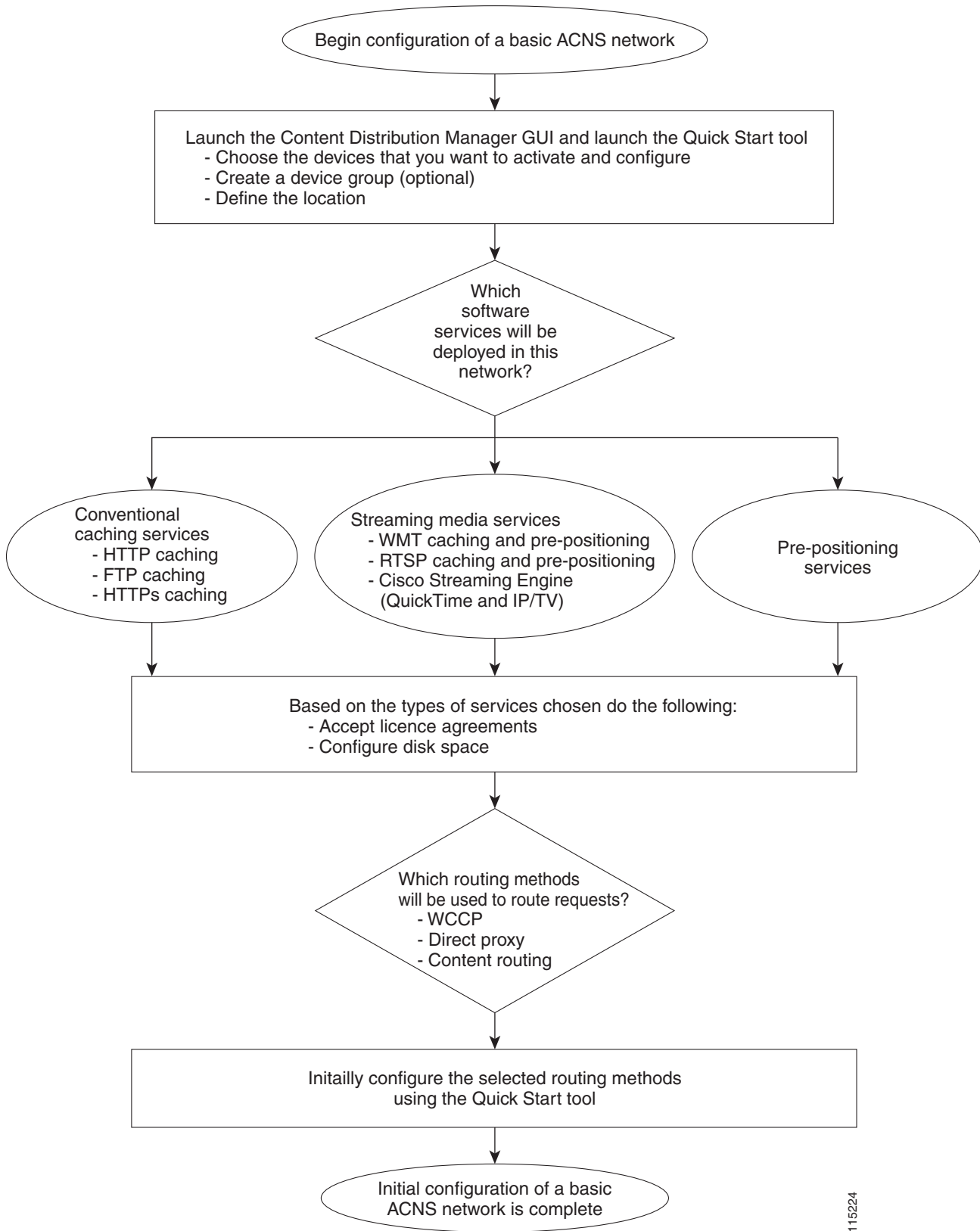
You can choose between two methods of initial network activation and configuration:

- Quick Start tool—Quick method
- Content Distribution Manager GUI—Standard method

We recommend that you use the GUI-based Quick Start tool to activate your devices and to set up your basic ACNS network. Later you can modify this initial configuration through the standard Content Distribution Manager GUI or CLI. (See the [“Quick Network Configuration Using the Quick Start Tool” section on page 2-11.](#))

[Figure 2-2](#) shows the task flow for setting up a basic ACNS network using the Quick Start tool in the Content Distribution Manager GUI.

Figure 2-2 Setting Up a Basic ACNS Network



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Summary of Initial Configuration Tasks

This section summarizes the initial configuration tasks for setting up and configuring your ACNS network for both the quick setup method and the standard configuration method, and it directs you to sections or other chapters that describe these tasks in more detail.

Enable a Content Distribution Manager

1. Power up a Content Engine 565, 566, or 7305, and bypass autoregistration by pressing any key within the first 30 seconds during bootup.
2. Configure the device mode using the interactive setup utility or by using the **device mode** global configuration command in the CLI.
(To use the setup utility, see [Quick Device Configuration Using the Setup Utility, page 2-9.](#))
(For CLI configuration, see [Configuring the Device Mode, page 2-13.](#))
3. Configure a primary Content Distribution Manager, and enable management services using the interactive setup utility or the CLI.
(To use the setup utility, see the [Quick Device Configuration Using the Setup Utility, page 2-9.](#))
(For CLI configuration, see the [Configuring the Content Distribution Manager, page 2-15.](#))
4. Configure a standby Content Distribution Manager (optional).

Enable a Content Router (optional)

1. Power up the Content Router or Content Engine.
2. Configure the device mode using the interactive setup utility or by using the **device mode** global configuration command in the CLI.
(To use the setup utility, see [Quick Device Configuration Using the Setup Utility, page 2-9.](#))
(For CLI configuration, see [Configuring the Device Mode, page 2-13.](#))
3. Do you have a DHCP server configured?
 - Yes. Autoregistration automatically configures network settings and registers Content Routers with the Content Distribution Manager upon bootup.
(See [Quick Device Configuration Using Autoregistration, page 2-7.](#))
 - No. Disable autoregistration and manually configure the network settings, and register the device with the Content Distribution Manager using the interactive setup utility or the CLI.
(To use the setup utility, see [Quick Device Configuration Using the Setup Utility, page 2-9.](#))
(For CLI configuration, see [Configuring the Device Network Settings, page 2-14](#) and [Registering a Device with the Content Distribution Manager, page 2-19.](#))
4. Configure your DNS server for the Content Router.
(See [Configuring Content Request Routing Using a Content Router or Routing Content Engine, page 4-40.](#))

Enable Content Engines

1. Power up the Content Engine.
2. Do you have a DHCP server configured?
 - Yes. Autoregistration automatically configures network settings and registers Content Engines with the Content Distribution Manager upon bootup.

(See [Quick Device Configuration Using Autoregistration, page 2-7.](#))

- No. Disable autoregistration and manually configure network settings, and register the device with the Content Distribution Manager.

Using either the interactive setup utility or the CLI, configure the following network settings:

Ethernet interface

IP domain name

Host name

IP name server

Default gateway

Primary interface

(To use the setup utility, see [Quick Device Configuration Using the Setup Utility, page 2-9.](#))

(For CLI configuration, see [Configuring the Device Network Settings, page 2-14](#), and [Registering a Device with the Content Distribution Manager, page 2-19.](#))

Configure Content Engine Disk Space

1. Determine which software services you wish to enable.

The software services that you have enabled will determine the types of file systems that you need to configure and the amount of disk space appropriate for each type of service.
2. Create disk space for conventional caching (cfs), pre-positioning (cdnfs), streaming services (mediafs), and system use (sysfs).
 - Use the Quick Start tool to choose a basic disk configuration.

(See [Quick Network Configuration Using the Quick Start Tool, page 2-11.](#))
 - Configure disk space using the CLI.

(See [Configuring Disk Space, page 2-18.](#))
 - Configure disk space using the Content Distribution Manager GUI File System Configuration window.

(See the *Cisco ACNS Software Update and Maintenance Guide.*)
3. Reboot the device for the disk configuration to take effect.

Activate All Devices

From the Content Distribution Manager GUI, activate all devices that are registered with the Content Distribution Manager using either the Quick Start tool or the standard Device Activation window.

(To use the Quick Start tool, see [Quick Network Configuration Using the Quick Start Tool, page 2-11.](#))

(To use the Device Activation window, see [Activating Devices in the Content Distribution Manager GUI, page 2-21.](#))

Enable Software Services

Choose basic software services in the Quick Start tool, or enable software services using the Content Distribution Manager GUI.

(For advanced caching, streaming, and pre-positioning configuration information, see the appropriate chapters found in the “[Managing ACNS Network Devices](#)” section of this guide.)

Configure One or More Request Routing Methods

1. Initially configure the request routing method or methods for your network.
 - Use the Quick Start tool (recommended method for getting your ACNS network up and running quickly).
 - Use the standard Content Distribution Manager GUI to configure your Content Engine for request routing.
2. Configure other devices, and set up your network infrastructure to route requests according to the routing methods used in your network.
3. For more information, see [Chapter 4, “Setting Up Content Request Routing in the ACNS Network.”](#)

Using the Quick Setup Method

This section explains how to quickly configure your ACNS devices and set up a basic ACNS network. Choose one of the following quick device configuration methods:

- [Quick Device Configuration Using Autoregistration, page 2-7](#)
- [Quick Device Configuration Using the Setup Utility, page 2-9](#)

After you complete the initial device configuration, use the following quick network configuration method to quickly set up a basic ACNS network:

- [Quick Network Configuration Using the Quick Start Tool, page 2-11](#)

Quick Device Configuration Using Autoregistration

Autoregistration automatically configures network settings and registers Content Engines with the Content Distribution Manager.

On bootup, devices running ACNS 5.x software (with the exception of the Content Distribution Manager itself) automatically discover the Content Distribution Manager and register with it. The administrator does not have to do any manual configuration on the device. Once the device is registered, the administrator approves the device and configures it remotely using the Content Distribution Manager GUI. (See the “[Activating Devices in the Content Distribution Manager GUI](#)” section on [page 2-21.](#))

Autoregistration uses a form of Dynamic Host Configuration Protocol (DHCP). For autoregistration to work, you must have a DHCP server that is configured with the host name of the Content Distribution Manager and that is capable of handling vendor class option 43.

**Note**

The form of DHCP used for autoregistration is *not* the same as the interface-level DHCP that is configurable through the **ip address dhcp** interface configuration command. (See the [“About Selecting Static IP Addresses or Using Interface-Level DHCP”](#) section on page 2-11 for an explanation of interface-level DHCP.)

The vendor class option (option 43) information needs to be sent to the ACNS network device in the format for encapsulated vendor-specific options as provided in RFC 2132. The relevant section of RFC 2132, Section 8.4, is reproduced here as follows:

The encapsulated vendor-specific options field should be encoded as a sequence of code/length/value fields of syntax identical to that of the DHCP options field with the following exceptions:

1. There should not be a “magic cookie” field in the encapsulated vendor-specific extensions field.
2. Codes other than 0 or 255 may be redefined by the vendor within the encapsulated vendor-specific extensions field but should conform to the tag-length-value syntax defined in section 2.
3. Code 255 (END), if present, signifies the end of the encapsulated vendor extensions, not the end of the vendor extensions field. If no code 255 is present, then the end of the enclosing vendor-specific information field is taken as the end of the encapsulated vendor-specific extensions field.

In accordance with the RFC standard, the DHCP server needs to send the Content Distribution Manager host name information in code/length/value format (code and length are single octets). The code for the Content Distribution Manager host name is 0x01. DHCP server management and configuration are not within the scope of the autoregistration feature.

The ACNS network device sends “CISCOCDN” as the vendor class identifier in option 60 to facilitate device groupings by customers.

Autoregistration DHCP also requires that the following options be present in the DHCP server’s offer to be considered valid:

- Subnet-mask (option 1)
- Routers (option 3)
- Domain-name (option 15)
- Domain-name-servers (option 6)
- Host-name (option 12)

In contrast, interface-level DHCP requires only subnet-mask (option 1) and routers (option 3) for an offer to be considered valid; domain-name (option 15), domain-name-servers (option 6), and host-name (option 12) are optional. All of the above options, with the exception of domain-name-servers (option 6), replace the existing configuration on the system. The domain-name-servers option is added to the existing list of name servers with the restriction of a maximum of eight name servers.

Autoregistration is enabled by default on the first interface of the device. The first interface depends on the Content Engine model as follows:

- For the CE-507, CE-507AV, CE-560, CE-560AV, CE-590, and CR-4430: FastEthernet 0/0
- For the CE-510, CE-511, CE-565, CE-566, CE-7305, CE-7325, and CE-7320: GigabitEthernet 1/0

If you do not have a DHCP server, the device is unable to complete autoregistration and eventually times out. You can disable autoregistration at any time after the device has booted and proceed with manual setup and registration.

To disable autoregistration, or to configure autoregistration on a different interface, use the **no auto-register enable** command in global configuration mode.

**Note**

Autoregistration is automatically disabled if a static IP address is configured or if interface-level DHCP is configured on the same interface as autoregistration. (See the [“About Selecting Static IP Addresses or Using Interface-Level DHCP”](#) section on page 2-11.)

The following example disables autoregistration on Fast Ethernet port 0/0:

```
CE(config)# no auto-register enable FastEthernet 0/0
```

Autoregistration status can be obtained by using the following **show** command:

```
CE# show status auto-register
```

You have completed the initial device configuration requirements by using the autoregistration feature. Now you must activate your Content Engines and Content Routers in the Content Distribution Manager GUI and configure any additional network interfaces. You can activate your Content Engines by using the Quick Start tool (see the [“Quick Network Configuration Using the Quick Start Tool”](#) section on page 2-11), or you can follow the steps in the [“Initial Network Configuration Using the Standard Content Distribution Manager GUI”](#) section on page 2-21.

Quick Device Configuration Using the Setup Utility

The setup utility is automatically invoked at system bootup when the startup configuration area in flash memory is empty (such as when the device is factory-fresh). This tool can also be launched using the **setup** command in EXEC mode.

The setup utility allows you to configure network settings and register with the Content Distribution Manager using an interactive dialog instead of the CLI. If you wish, you can disable autoregistration by responding to the setup utility prompt and configuring the first interface on your device (Ethernet 0/0 or GigabitEthernet 1/0) with either a static IP address or with interface-level DHCP. (See the [“About Selecting Static IP Addresses or Using Interface-Level DHCP”](#) section on page 2-11.) If you specify the configuration on the interface that uses autoregistration, autoregistration is automatically disabled. You can also use the setup utility to configure other interfaces if you have multiple interfaces on your device.

**Note**

The admin password prompt only appears at bootup when the startup configuration area is empty. The utility prompts you for the device mode only on Content Engine models that allow device mode changes.

To use the setup utility, follow these steps:

Step 1 Power up the device and open a console connection.

After the operating system boots, the following prompt appears:

```
ACNS boot:detected no saved system configuration
Do you want to enter basic configuration now?
hit RETURN to enter basic configuration:0028
```

At the appearance of this prompt, a 30-second countdown begins, during which you can respond to this prompt and initiate the setup utility. If you do not respond, the system continues booting and automatically registers with the Content Distribution Manager.

Step 2 Press **Enter**, and then enter responses as you are prompted.

In the following sample setup utility, administrator entries are shown in bold. The administrator has chosen not to enable DHCP.

```

admin password:
re-enter password:

What is the mode of the device (CE/CR/CDM/PM) [CE]: CE

Is this CE going to be managed by a
CDM (Content Distribution Manager) (y/n) [y]: y

Please choose an interface to configure from the following list:
1: GigabitEthernet 1/0
2: GigabitEthernet 2/0

Enter choice: 1

Do you want to enable DHCP on this interface (y/n) [n]: n

Please enter the IP address of this interface [209.165.200.231]: <Enter>

Please enter the netmask of this interface [255.255.255.224]: <Enter>

Please enter the default gateway [209.165.200.225]: <Enter>

Please enter the domain name server ip [172.30.2.133]: <Enter>

Please enter the domain name [cisco.com]: <Enter>

Please enter the hostname [CE565]: <Enter>

Please enter CDM (Content Distribution Manager) IP or Host name [172.16.226.212]: <Enter>

Do you want to apply the configurations (y/n) [y]: y

```

Step 3 Choose whether or not to save the configuration. You should see the following message:

```

This may take few moments. Please wait..

For your reference, configuration generated
during this setup session is available at /local1/setup_gen_config.txt.
You can view this file with the command, "type /local1/setup_get_config.txt".

Press any key to continue..

```

After you choose to save the configuration, the device performs hardware and software initialization tasks and then serves a login challenge that, when answered correctly, launches the CLI. At this point, the initial configuration is complete.

Step 4 To make sure that a primary interface has been configured, use the **show running-config EXEC** command. A primary interface should have been chosen automatically by the software during the initial startup; however, you can configure a primary interface manually by using the **primary-interface** command in global configuration mode.

You have completed the initial device configuration requirements by using the setup utility. Now you must activate your Content Engines and Content Routers in the Content Distribution Manager GUI and configure any additional network interfaces. You can activate your Content Engines by using the Quick Start tool. (See the [“Quick Network Configuration Using the Quick Start Tool”](#) section on page 2-11, or you may follow the steps in the [“Initial Network Configuration Using the Standard Content Distribution Manager GUI”](#) section on page 2-21.)

About Selecting Static IP Addresses or Using Interface-Level DHCP

During the initial configuration, you have the option of configuring a static IP address for the device or choosing DHCP. This section describes these two options.

DHCP is a communications protocol that lets network administrators manage their networks centrally and automate the assignment of IP addresses in an organization's network. When an organization sets up its computer users with a connection to the Internet, an IP address must be assigned to each device. Without DHCP, the IP address must be entered manually for each computer, and if computers move to another location in another part of the network, a new IP address must be entered. DHCP automatically sends a new IP address when a computer is connected to a different site in the network.

In the following sample setup utility, the administrator has chosen to enable DHCP. Administrator entries are shown in bold. (See also the [“Configuring Interfaces for DHCP”](#) section on page 14-13.)

```
BOOT-100:sw-fileSYSTEMS mounted, applying pending upgrades...
SW up-to-date
```

```
ACNS boot:detected no saved system configuration
  Do you want to enter basic configuration now?
  hit RETURN to enter basic configuration:0019
admin password:
re-enter password:
Is this CE going to be managed by a
CDM (Content Distribution Manager) (y/n) [y]: y
```

```
Please choose an interface to configure from the following list:
1: FastEthernet 0/0
2: FastEthernet 0/1
```

```
Enter choice: 1
```

```
Do you want to enable DHCP on this interface (y/n) [n]: y
Please enter CDM (Content Distribution Manager) IP or Host name [172.16.226.212]: <Enter>
```

```
Do you want to apply the configurations (y/n) [y]: y
```

Quick Network Configuration Using the Quick Start Tool

The Content Distribution Manager GUI Quick Start tool helps you set up a small and simple ACNS network with minimal time and effort. From the Quick Start tool you can select a set of Content Engines and provision them for caching, streaming, and pre-positioning of content. You can configure these services using a small subset of options. Advanced options are available from the main user interface. Additionally, the Quick Start tool allows you to choose one or more methods for content routing. As with content services, the tool only supports a small set of options for content routing.

[Table 2-1](#) describes the configuration tasks that can be accomplished using the Content Distribution Manager Quick Start tool.

Table 2-1 Using the Content Distribution Manager Quick Start Tool

Task	Description
Choose Content Engines from the device listing.	The tool creates a device group and a location. It activates any inactive devices.
Choose caching, streaming, and pre-positioned content services desired.	The tool enables the protocols for caching, streaming, and pre-positioning services and configures disk space allocation based on the types of services chosen.
Choose a content request routing method.	The choices are WCCP Version 2 routing, direct proxy routing, or content routing (the last requires a Content Router).

Before using the Quick Start tool, you must first complete the initial device configuration and setup as described for centrally managed deployments.

**Note**

Before you can access the Content Distribution Manager GUI, you must use the CLI to register yourself as a user. Use the **username** global configuration command to configure your name and password for GUI access.

To access the Quick Start tool, follow these steps:

- Step 1** In your web browser, enter the URL or IP address for the Content Distribution Manager. For example, enter the URL:
https://Name_of_Content_Distribution_Manager:8443
 Alternatively, enter the IP address:
https://IP_address_of_Content_Distribution_Manager:8443
 The Security Alert window appears.
- Step 2** Click **Yes** to accept the security certificate. The Login window appears.
- Step 3** Enter your username in the Username field. Enter your password in the Password field, and click **Login**.

**Note**

The default username is *admin* and the default password is *default*. If the defaults have been changed by another Content Distribution Manager administrator, you need to obtain the new username and password.

The System Home window appears.

- Step 4** Click the **Quick Start** button in the upper right corner of the window. The Quick Start tool opens in a separate window.
- Step 5** Follow the instructions in the Quick Start dialog boxes to complete a quick configuration.

Initial Device Configuration Using the Standard CLI

This section discusses initial device configuration using the standard CLI. You can choose this method to initially configure your devices *instead* of using one of the quick device configuration methods. You can also refer to these procedures when you need to troubleshoot the device network settings.

The procedures that follow assume that you have physically installed the hardware and powered up your device. After you physically install the hardware and power up your device, you can access the ACNS software through a console connection or a Telnet session. If you choose to use this method to initially configure your devices, we recommend that you complete the tasks in the order presented in this section.

**Note**

If you have upgraded your software from a previous ACNS software release to ACNS 5.x software, your network configuration is preserved. You do not need to reconfigure your network settings.

Configuring the Device Mode

All ACNS devices ship from the factory as Content Engines. Before configuring network settings for Content Distribution Managers and Content Routers using the CLI, you first need to change the device from a Content Engine to the proper device mode.

**Note**

Additional steps are required to change the device mode of a device that is already operating as part of your ACNS network. See the [“Repurposing an ACNS Network Device”](#) section on page 13-36.

Configuring the device mode is not a supported option on all hardware models. However, some hardware models can be configured to operate as any one of the three Content Networking device types. Devices that can be reconfigured using the **device mode** global configuration command are shipped from the factory by default as Content Engines.

The following hardware models support device mode configuration:

- CE-7305
- CE-7326
- CE-565
- CE-566

To change the device mode of your eligible Content Engine, you must also configure the disk space allocations, as required by the different device modes, and reboot the device for the new configuration to take effect. (See the [“Configuring Disk Space”](#) section on page 2-18.)

When you change the device mode of a Content Engine to a Content Router or a Content Distribution Manager, you need to configure the system file system (sysfs). We recommend that for a Content Router or a Content Distribution Manager, you configure sysfs at 100 percent. For example:

```
CR# disk config sysfs 100% cfs 0% mediafs 0% cdnfs 0%
```

If, however, you are changing the device mode of a Content Router or a Content Distribution Manager back to a Content Engine, you must configure disk space allocations for the caching (cfs), pre-positioning (cdnfs), streaming (mediafs), and system use (sysfs) file systems that are used on the Content Engine. (See the *Cisco ACNS Software Update and Maintenance Guide*) For example:

```
DeviceName# disk config sysfs 10% cfs 20% mediafs 10% cdnfs 60%
```

To configure the device mode, follow these steps:

-
- Step 1** Boot the device and access the device CLI through the console or a Telnet session.
- Step 2** Enter the **show device-mode current** EXEC command to view the current device mode.
- ```
DeviceName# show device-mode current
Current device mode: content-engine
```
- Step 3** Configure the new device mode by using the **device mode** command in global configuration mode.
- ```
DeviceName# configure
DeviceName(config)# device mode content-router
```
- Step 4** Save the configuration by issuing the **write memory** EXEC command or the **copy running-config startup-config** EXEC command.
- ```
DeviceName# write memory

DeviceName# copy running-config startup-config
```
- Step 5** Use the **restore factory-default preserve basic-config** EXEC command to reload the software and apply the device mode configuration. Your network settings are preserved.
- ```
DeviceName# restore factory-default preserve basic-config
```
- Step 6** Verify the new configuration. Check that the current and configured device modes are the same.
- ```
DeviceName# show device-mode configured
Configured Device mode: content-router
DeviceName# show device-mode current
Current device mode: content-router
```
- Step 7** Configure the disk space allocation based on the new device mode and needs of your network by using the **disk config** EXEC command.
- Step 8** Reload the device for the disk configuration to take effect.
- ```
DeviceName# reload
```

After the device reloads and you have verified the device mode configuration, you are ready to configure the network settings. (See the next section, “[Configuring the Device Network Settings.](#)”) We recommend that you begin by configuring the Content Distribution Manager.

Configuring the Device Network Settings

To configure network settings using the CLI, follow these steps:

-
- Step 1** Power up the device and log on through the console. At the login prompt, enter the username **admin** and the password **default**.
- You must log in to the CLI with an ACNS system account that has superuser privileges.
 - You must use a console connection to complete this initial configuration. After this initial configuration is complete, you can use Telnet sessions to access the CLI for subsequent configuration tasks, such as disk configuration.
- Step 2** From the device CLI, enter global configuration mode.

```
CE-507# config
CE-507(config)#
```

Step 3 In global configuration mode, configure the device network settings by using the following commands:

- Configure your Ethernet interface for DHCP.

```
CE-507(config)# interface {FastEthernet | GigabitEthernet} slot/port ip address dhcp
```

The remainder of your network settings are configured automatically. You have finished configuring your network settings.

- Alternatively, configure the static IP address of your Ethernet interface.

```
CE-507(config)# interface {FastEthernet | GigabitEthernet} slot/port ip address
ip-address netmask
```

Step 4 Continue configuring the remaining network settings.

- a. Configure the IP domain name.

```
CE-507(config)# ip domain-name name1 name2 name3
```

- b. Configure the host name.

```
CE-507(config)# hostname name
```

- c. Configure the IP name server.

```
CE-507(config)# ip name-server ip-address
```

- d. Configure the IP default gateway.

```
CE-507(config)# ip default-gateway ip-address
```

- e. Configure the primary interface.

```
CE-507(config)# primary-interface {FastEthernet | GigabitEthernet} slot/port [dhcp]
```

You have completed configuration of network settings. To continue with the Content Distribution Manager setup, proceed to the next section, “[Configuring the Content Distribution Manager](#).”

Configuring the Content Distribution Manager

The Content Distribution Manager has some unique setup requirements. You cannot autoregister this device. However, you can choose to initially configure it using the interactive setup utility or the CLI. This section describes how to initially configure a Content Distribution Manager using the CLI. You must configure the Content Distribution Manager before you can register any Content Engines or Content Routers with the Content Distribution Manager.

In ACNS 5.x software, Content Distribution Managers can operate in two different roles: primary and standby. The primary role is the default. You can have only one primary Content Distribution Manager that is active in your network; however, you can have any number of Content Distribution Managers operating in a standby role to provide redundancy and failover capacity. We recommend that you configure the primary Content Distribution Manager first.

**Note**

Primary and standby Content Distribution Managers must be running the same version of ACNS software. If they are not, the standby Content Distribution Manager detects this and shuts down the Centralized Management System (CMS) until the problem is corrected. We recommend that you upgrade your standby Content Distribution Manager first and then upgrade your primary Content Distribution Manager.

To configure the primary Content Distribution Manager using the CLI, follow these steps:

- Step 1** Create and initialize the management database, and enable ACNS services by using the **cms enable** global configuration command.

```
CDM-4630(config)# cms enable
```

- Step 2** Verify that services have been enabled by using the **show cms processes EXEC** command.

```
CDM-4630# show cms processes
Service cms_httpd is running
Service cms_cdm is running
CDM-4630#
```

- Step 3** Check the current running configuration by using the **show running-config EXEC** command.

```
CDM-4630# show running-config
```

A message similar to the following should appear:

```
-----
...
cms enable
!
...
-----
```

- Step 4** To save the configuration, use the **copy running-config startup-config EXEC** command.

```
CDM-4630# copy running-config startup-config
```

To configure a standby Content Distribution Manager role, follow these steps:

- Step 1** Configure the standby Content Distribution Manager role by using the **cdm role** global configuration command.

```
CDM-4630(config)# cdm role standby
```

- Step 2** Configure the standby Content Distribution Manager with the IP address of the primary Content Distribution Manager by using the **cdm ip** *{ip-address | hostname}* global configuration command.

```
CDM-4630(config)# cdm ip 10.1.1.90
```

This command associates the device with the primary Content Distribution Manager so that it can be approved as a part of the network.

- Step 3** Create and initialize the management database, and enable ACNS services by using the **cms enable** global configuration command.

```
CDM-4630(config)# cms enable
```

- Step 4** Verify that services have been enabled by using the **show cms processes EXEC** command.

```
CDM-4630# show cms processes
Service cms_httpd running
Service cms_ui running
Service cms_cdm running
```

- Step 5** Check the current running configuration by using the **show running-config EXEC** command.

```
CDM-4630# show running-config
```

A message similar to the following should appear:

```
-----
...
cms enable
!
...
-----
```

- Step 6** To save the configuration, use the **copy running-config startup-config EXEC** command.

```
CDM-4630# copy running-config startup-config
```

- Step 7** Activate the newly registered standby Content Distribution Manager in the primary Content Distribution Manager GUI in the same manner as you would activate a newly registered Content Engine or Content Router. (See the [“Activating Devices in the Content Distribution Manager GUI”](#) section on page 2-21.)

After you activate your standby Content Distribution Manager, the primary Content Distribution Manager notifies all registered Content Engines and Content Routers that a standby Content Distribution Manager exists in the system and sends each of these devices the information they need to contact the standby Content Distribution Manager when the primary Content Distribution Manager fails or becomes inactive.



Note You cannot log into the standby Content Distribution Manager GUI, and the standby Content Distribution Manager does not send configuration updates to any of the registered Content Engines or Content Routers. While it is operating as a standby Content Distribution Manager, its only function is to maintain an up-to-date copy of the primary Content Distribution Manager database. The standby accomplishes this by periodically polling the primary Content Distribution Manager for the latest configuration changes.

You have configured a primary Content Distribution Manager and an optional standby Content Distribution Manager. You are now ready to configure the network settings for all of your Content Engines and Content Routers. (See the [“Configuring the Device Network Settings”](#) section on page 2-14.)

To change a standby Content Distribution Manager to a primary Content Distribution Manager, follow these steps:

- Step 1** If your primary Content Distribution Manager is still operating, access the primary Content Distribution Manager through the console or through a Telnet Secure Shell session, and issue the following global configuration command:

```
CDM1(config)# cdm role standby
```



Note If your primary Content Distribution Manager is not operating because the hardware has failed or for any other reason, you can omit [Step 1](#).

- Step 2** Access the standby Content Distribution Manager through the console or through a Telnet Secure Shell session, and issue the following global configuration command:

```
CDM1(config)# cdm role primary
```

You do not need to take any action on your Content Engines or Content Routers. These devices automatically detect the new primary Content Distribution Manager and begin receiving configuration updates from this Content Distribution Manager.



Note If you have recently made configuration changes to the primary Content Distribution Manager, we recommend that you wait at least one polling interval (System.datafeed.pollRate) before you change roles with the standby Content Distribution Manager, so that the standby has a record of the most recent configuration changes.



Note You cannot deploy a standby Content Distribution Manager behind a NAT firewall when the Content Engines and Content Routers that it manages are on the other side of the firewall.

Configuring Disk Space

If you are configuring a Content Engine for the first time, you need to create disk space for system use (sysfs), caching (cfs), streaming (mediafs), and pre-positioning (cdnfs) on the Content Engine by using the **disk config** command in EXEC mode. The sysfs should not be less than 3 GB.



Note For the Content Router or Content Distribution Manager device modes, we recommend that you allocate 100 percent of the disk space to the sysfs.

To configure disk space using the CLI, follow these steps:

- Step 1** Exit configuration mode, if you have not already done so.

```
CE-507(config)# exit  
CE-507#
```

- Step 2** Enter the **disk config** EXEC command. For example:

```
CE-507# disk config sysfs 10% cfs 20% mediafs 10% cdnfs 60%
```

- Step 3** Reload the Content Engine for the disk configuration to take effect.

```
CE-507# reload
```



Tip For the new disk space configuration to take effect, you must first reboot the device; however, if you are going to change the device mode, you can wait to reboot until after you have configured the new device mode.

To update the disk configuration through the Content Distribution Manager GUI, follow the procedure in the “Updating Storage Capacity on Your Content Engines” section in the *Cisco ACNS Software Upgrade and Maintenance Guide*.

If you are attaching and configuring a Fibre Channel storage array, see the “Using a Fibre Channel Storage Array” section in the *Cisco ACNS Software Upgrade and Maintenance Guide*. Do not attempt to assign the Fibre Channel storage to the Content Engine and configure the file systems with a single reload of the Content Engine. If you do, the Fibre Channel storage assignment is recognized, but the disk configuration is not applied. An error message appears at bootup, similar to the following:

```
-----
ruby_disk:physical disk setup appears to have changed
ruby_disk:not applying 'disk config' changes. Please re-enter via CLI.
-----
```

If you encounter this error message, reenter your disk configuration and use the **reload** command on the Content Engine for the disk configuration to be applied.

Registering a Device with the Content Distribution Manager

Before a newly installed Content Engine or Content Router can be recognized by the Content Distribution Manager, it must be registered with the Content Distribution Manager. This section describes how to register a device using the standard CLI.



Note

To deregister a device, see the “Deleting a Content Router” section on page 13-24 or the “Deleting a Content Engine” section on page 13-12.

If you do not have a DHCP server in your network, or if for some reason your DHCP server is configured incorrectly, you can set up and register a device manually. To manually register your ACNS network devices, you must first disable autoregistration. This can be done by enabling the setup utility, or through the CLI after the device has booted by using the **no auto-register enable** command in global configuration mode.

To register a new device using the CLI, follow these steps:

- Step 1** Set the IP address or host name of the Content Distribution Manager with which the device is to be associated by using the **cdm ip** global configuration command.

```
CE-507# config
CE-507(config)# cdm ip {ip-address | hostname}
```

This command associates the device with the Content Distribution Manager so that the device can be approved as a part of the network.

After the device is configured with the Content Distribution Manager IP address, it presents a self-signed security certificate as well as other essential information, such as its IP address or host name, disk space allocation, and so forth, to the Content Distribution Manager.

- Step 2** To register the device, create and initialize the management database, and enable ACNS services, use the **cms enable** global configuration command.

```
CE-507(config)# cms enable
```

The CMS database table stores the device node configuration, allowing the node to be centrally managed from the Content Distribution Manager.

Step 3 Use the **show cms info** EXEC command to verify that your device has been registered.

```
CE-507# show cms info
```

A message similar to the following should appear:

```
Registration information :
CDM address              = 10.1.1.90
Device Mode              = ce
Model                    = CE507
Node Id                  = 84
ce507#
```

Step 4 To verify that the CMS is running, use the **show cms processes** EXEC command.

```
CE-507# show cms processes
```

A message similar to the following should appear:

```
Service cms_ce running
ce507#
```

Step 5 Verify the current running configuration by using the **show running-config** EXEC command.

```
CE-507# show running-config
```

A message similar to the following should appear:

```
-----
...
cms enable
!
...
-----
```

Step 6 To save the configuration, use the **copy running-config startup-config** EXEC command.

```
CE-507# copy running-config startup-config
```

The next step is to authorize the device to become part of the ACNS network by approving the device in the Content Distribution Manager GUI, as described in the section, [“Activating Devices in the Content Distribution Manager GUI.”](#)

Initial Device Configuration Summary

In this section you accomplished the following:

- Changed the Content Engine device mode to enable one or more Content Distribution Managers
- Changed the Content Engine device mode to enable one or more Content Routers (optional)
- Configured network settings for your Content Distribution Managers, Content Engines, and Content Routers
- Configured one primary Content Distribution Manager and one or more standby Content Distribution Managers

- Configured disk space for various file systems
- Registered Content Engines and Content Routers with the Content Distribution Manager

You have completed the initial device configuration requirements. Now you must activate your Content Engines and Content Routers in the Content Distribution Manager GUI and configure any additional network interfaces. The next section (“[Initial Network Configuration Using the Standard Content Distribution Manager GUI](#)”) guides you through these steps.

Initial Network Configuration Using the Standard Content Distribution Manager GUI

If you have chosen *not* to use the Quick Start tool to initially configure a basic ACNS network, then the first task that you must perform after initially configuring your devices is to activate your devices in the Content Distribution Manager GUI.

This section describes the steps for activating devices in a centrally managed environment. The procedures for configuring other ACNS network elements using the standard Content Distribution Manager GUI are found in subsequent chapters of this guide. (See the “[Summary of Initial Configuration Tasks](#)” section on page 2-5 for chapter and section references.)

Activating Devices in the Content Distribution Manager GUI

Content Engines and Content Routers that are being newly added to the ACNS network need to be approved by the network administrator. The network administrator approves each device by making it active in the Content Distribution Manager GUI. This security feature prevents unauthorized devices from joining the network. This section discusses how to activate devices using the standard Content Distribution Manager GUI.

**Note**

Before you can access the Content Distribution Manager GUI, you must use the CLI to register yourself as a user. Use the **username** global configuration command to configure your name and password for GUI access.

To activate a Content Engine or Content Router using the Content Distribution Manager GUI, follow these steps:

- Step 1** Open the Content Distribution Manager GUI from your web browser by entering the URL or IP address of the Content Distribution Manager. For example, from your browser, enter one of these URLs:
`https://name_of_Content_Distribution_Manager:8443`
or
`https://IP_address_of_Content_Distribution_Manager:8443`
A window appears, requesting your username and password.
- Step 2** Enter the administrator username **admin** and the password **default**, and click **OK**. The Cisco Application and Content Networking System Home window appears.
- Step 3** Choose **Devices > Devices**. A list of all your registered Content Engines and Content Routers appears.
- Step 4** Click the **Edit** icon next to the device name. The Device Home window appears.

- Step 5** To display the entire table of contents, click the **Show All** button above the Contents pane.
- Step 6** In the Contents pane choose Device Activation. The Device Activation window appears. (See Figure 2-3.)

Figure 2-3 Device Activation Window

- Step 7** Check the **Create a New Location** check box to create a default location for this Content Engine. Locations need to be configured before you can activate Content Engines and Content Routers and bring them online in the ACNS network.



Note This field is visible only if the Content Engine is in Inactive status. When checked, a default location for an inactive Content Engine is created. This option automatically creates a new location named <CE-name>-location and assigns the Content Engine to that location.

Alternatively, choose a location from the Location drop-down list. The list of locations that have been created using the Locations window are displayed in this drop-down list. If the location that has been chosen for the Content Engine contains a parent location, then the same location tree hierarchy is applied to the Content Engine.

This option allows you to choose an already created location. (If you have not already created a location, see the “Working with Device Locations” section on page 13-5.)

- Step 8** Choose a parent location for the default location from the Parent of the new Location drop-down list. This option allows you to choose an already created location as the parent for the newly created default location.

- Step 9** To activate the Content Engine or Content Router, check the **Activate** check box.

Step 10 To save the settings, click **Submit**. When the device becomes active, the status changes from “Inactive” to “Online.”

Other Content Engine properties can be configured now or at a later time. (To enable routing or to modify the default bandwidth settings, see the “[Modifying Content Engine Properties](#)” section on page 13-9.)

Activating All Inactive Content Engines

To activate all unactivated Content Engines as a group, follow these steps:

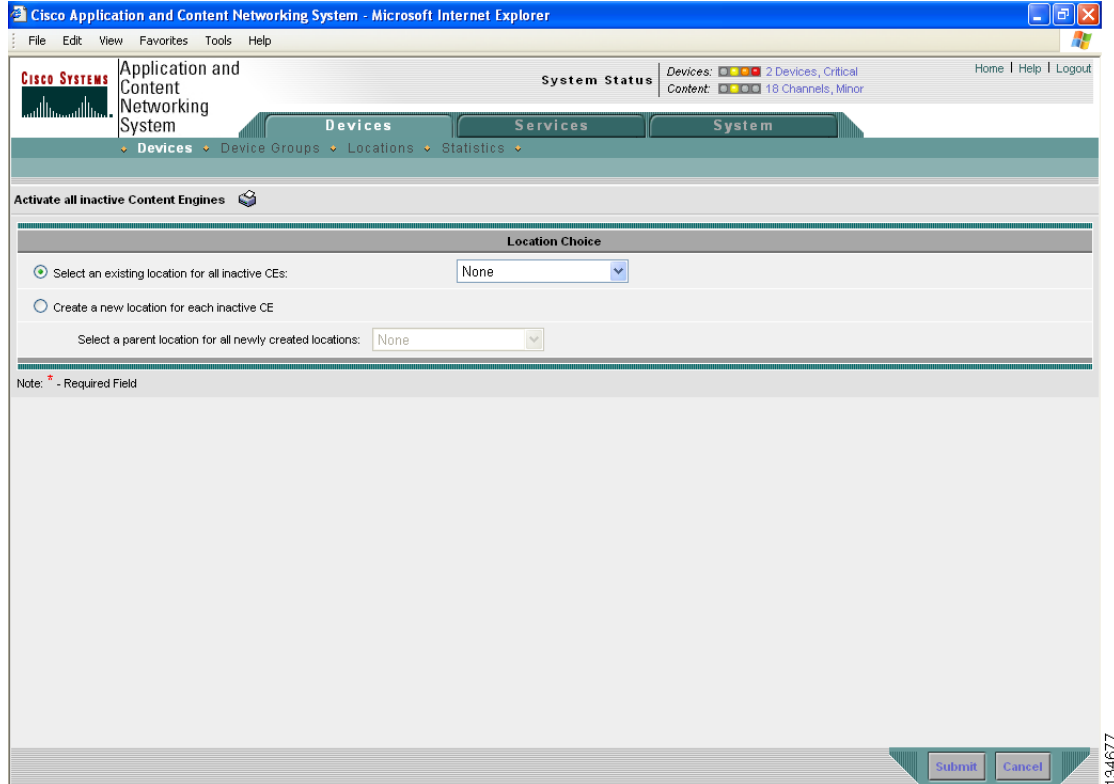
- Step 1** From the Content Distribution Manager GUI, choose **Devices > Devices**. The Devices listing window appears.
- Step 2** Click the **Activate all inactive CEs** icon. (See [Figure 2-4](#).) The Activate All Inactive Content Engines window appears.

Figure 2-4 Devices Listing Window

Device Name	Type	IP Address	Status	Location	Software Version
CDM	Content Distribution Manager (Primary)	10.1.1.90	Online		5.4.0.b.190
CONTENTENGINE	Content Engine	10.1.1.21	Online	ContentEngine-location	5.4.0.b.180
ContentRouter	Content Router	10.1.1.51	Online	ContentEngine-location	5.4.0.b.190
iptv-dev-510	Content Engine	10.77.155.221	Online	Loc-1	5.3.3.b.8
imaypall-507	Content Engine	10.77.155.242	Online	Loc-2	5.3.3.b.8
stream-dev1	Content Engine	10.77.156.140	Offline	Loc-Root	5.4.0.b.160

Step 3 In the Activate All Inactive Content Engines window (see [Figure 2-5](#)), choose an existing location for all unactivated Content Engines by clicking the **Select an existing location for all inactive CEs** radio button. Then choose a location from the drop-down list.

Alternatively, choose to create a new location for each inactive Content Engine by clicking the **Create a new location for each inactive CE** radio button. Then specify a parent location for all newly created locations by choosing a location from the Select a parent location for all newly created locations drop-down list.

Figure 2-5 Activate All Inactive Content Engines Window

Step 4 To save the settings, click **Submit**.

Where to Go Next

You have completed the initial ACNS device configuration and have set up a basic ACNS network. Your Content Engines and Content Routers (optional) are identified on the network and are communicating with the Content Distribution Manager. Basic software services for conventional caching, caching and streaming, and pre-positioning content are enabled, and your disk file systems are configured to allow the various types of content to be stored on the Content Engine. Now you must finish setting up the request routing infrastructure so that client requests for content can be routed to the origin server where the content resides. Proceed to the next chapter, [Chapter 4, “Setting Up Content Request Routing in the ACNS Network.”](#)