



# Performing Switch Setup Configuration

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table at the end of this module.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <http://www.cisco.com/go/cfn>. An account on Cisco.com is not required.

## Information About Performing Switch Setup Configuration

Review the sections in this module before performing your initial switch configuration tasks that include IP address assignments and DHCP autoconfiguration.

## Switch Boot Process

To start your switch, you need to follow the procedures in the hardware installation guide for installing and powering on the switch and setting up the initial switch configuration (IP address, subnet mask, default gateway, secret and Telnet passwords, and so forth).

The normal boot process involves the operation of the boot loader software and includes these activities:

- Performs low-level CPU initialization. It initializes the CPU registers, which control where physical memory is mapped, its quantity, its speed, and so forth.

- Performs power-on self-test (POST) for the CPU subsystem and tests the system DRAM.
- Initializes the file systems on the system board.
- Loads a default operating system software image into memory and boots up the switch.

The boot loader provides access to the file systems before the operating system is loaded. Normally, the boot loader is used only to load, decompress, and start the operating system. After the boot loader gives the operating system control of the CPU, the boot loader is not active until the next system reset or power-on.

The boot loader also provides trap-door access into the system if the operating system has problems serious enough that it cannot be used. The trap-door mechanism provides enough access to the system so that if it is necessary, you can reinstall the operating system software image by using the Xmodem Protocol, recover from a lost or forgotten password, and finally restart the operating system.

Before you can assign switch information, make sure you have connected a PC or terminal to the console port or a PC to the Ethernet management port, and make sure you have configured the PC or terminal-emulation software baud rate and character format to match these of the switch console port:

- Baud rate default is 9600.
- Data bits default is 8.




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**Note** If the data bits option is set to 8, set the parity option to none.

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- Stop bits default is 2 (minor).
- Parity settings default is none.

## Software Installer Features

The following software installer features are supported on your switch:

- Software bundle installation on a standalone switch, a switch stack, or a subset of switches in a stack. The default is installation on all the switches if a switch stack is configured.
- In a stack of switches, Cisco recommends all switches in install mode.
- Software rollback to a previously installed package set.
- Emergency installation in the event that no valid installed packages reside on the boot flash.
- Auto-upgrade of a switch that joins the switch stack with incompatible software.
- Installation using packages on one switch as the source for installing packages on another switch in the switch stack.




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**Note** Software installation and rollback must be performed while running only in installed mode. You can use the **software expand EXEC** command to convert bundle boot mode to install mode.

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## Software Boot Modes

Your switch supports two modes to boot the software packages:

- Installed mode
- Bundle mode

### Related Topics

[Examples: Displaying Software Bootup in Install Mode](#), on page 28

[Example: Emergency Installation](#), on page 30

## Installed Boot Mode

You can boot your switch in installed mode by booting the software package provisioning file that resides in flash:

```
switch: boot flash:packages.conf
```

The provisioning file contains a list of software packages to boot, mount, and run. The ISO file system in each installed package is mounted to the root file system directly from flash.



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**Note** The packages and provisioning file used to boot in installed mode must reside in flash. Booting in installed mode from usbflash0: or tftp: is not supported.

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### Related Topics

[Examples: Displaying Software Bootup in Install Mode](#), on page 28

[Example: Emergency Installation](#), on page 30

## Bundle Boot Mode

You can boot your switch in bundle boot mode by booting the bundle (.bin) file:

```
switch: boot flash:cat3850-universalk9.SSA.03.08.83.EMD.150-8.83.EMD.bin
```

The provisioning file contained in a bundle is used to decide which packages to boot, mount, and run. Packages are extracted from the bundle and copied to RAM. The ISO file system in each package is mounted to the root file system.

Unlike install boot mode, additional memory that is equivalent to the size of the bundle is used when booting in bundle mode.

Unlike install boot mode, bundle boot mode is available from several locations:

- flash:
- usbflash0:
- tftp:



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**Note** Auto install and smart install functionality is not supported in bundle boot mode.

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**Note** The AP image pre-download feature is not supported in bundle boot mode. For more information about the pre-download feature see the Cisco WLC 5700 Series *Preloading an Image to Access Points* chapter.

#### Related Topics

[Examples: Displaying Software Bootup in Install Mode](#), on page 28

[Example: Emergency Installation](#), on page 30

## Boot Mode for a Switch Stack

All the switches in a stack must be running in installed mode or bundle boot mode. A mixed mode stack is not supported. If a new switch tries to join the stack in a different boot mode than the active switch, the new switch is given a V-mismatch state.

If a mixed mode switch stack is booted at the same time, then all the switches except for the active switch is given a V-mismatch state. If the boot mode does not support auto-upgrade, then the switch stack members must be re-booted in the same boot mode as the active switch.

If the stack is running in installed mode, the auto-upgrade feature can be used to automatically upgrade the new switch that is attempting to join the switch stack.

The auto-upgrade feature changes the boot mode of the new switch to installed mode. If the stack is running in bundle boot mode, the auto-upgrade feature is not available. You will be required to use the bundle mode to boot the new switch so that it can join the switch stack.

This is an example of the state of a switch that attempts to join the switch stack when the boot mode is not compatible with the active switch:

```
Switch# show switch

Switch/Stack Mac Address : 6400.f125.1100 - Local Mac Address
Mac persistency wait time: Indefinite
H/W Current
Switch#   Role   Mac Address      Priority Version   State
-----
1         Member 6400 f125.1a00   1          0          V-Mismatch
*2        Active 6400.f125.1100  1          V01        Ready
Switch
```

## Switches Information Assignment

You can assign IP information through the switch setup program, through a DHCP server, or manually.

Use the switch setup program if you want to be prompted for specific IP information. With this program, you can also configure a hostname and an enable secret password.

It gives you the option of assigning a Telnet password (to provide security during remote management) and configuring your switch as a command or member switch of a cluster or as a standalone switch.

Use a DHCP server for centralized control and automatic assignment of IP information after the server is configured.



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**Note** If you are using DHCP, do not respond to any of the questions in the setup program until the switch receives the dynamically assigned IP address and reads the configuration file.

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If you are an experienced user familiar with the switch configuration steps, manually configure the switch. Otherwise, use the setup program described in the *Boot Process* section.

## DHCP-Based Autoconfiguration Overview

DHCP provides configuration information to Internet hosts and internetworking devices. This protocol consists of two components: one for delivering configuration parameters from a DHCP server to a device and an operation for allocating network addresses to devices. DHCP is built on a client-server model, in which designated DHCP servers allocate network addresses and deliver configuration parameters to dynamically configured devices. The switch can act as both a DHCP client and a DHCP server.

During DHCP-based autoconfiguration, your switch (DHCP client) is automatically configured at startup with IP address information and a configuration file.

With DHCP-based autoconfiguration, no DHCP client-side configuration is needed on your switch. However, you need to configure the DHCP server for various lease options associated with IP addresses.

If you want to use DHCP to relay the configuration file location on the network, you might also need to configure a Trivial File Transfer Protocol (TFTP) server and a Domain Name System (DNS) server.



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**Note** We recommend a redundant connection between a switch stack and the DHCP, DNS, and TFTP servers. This is to help ensure that these servers remain accessible in case one of the connected stack members is removed from the switch stack.

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The DHCP server for your switch can be on the same LAN or on a different LAN than the switch. If the DHCP server is running on a different LAN, you should configure a DHCP relay device between your switch and the DHCP server. A relay device forwards broadcast traffic between two directly connected LANs. A router does not forward broadcast packets, but it forwards packets based on the destination IP address in the received packet.

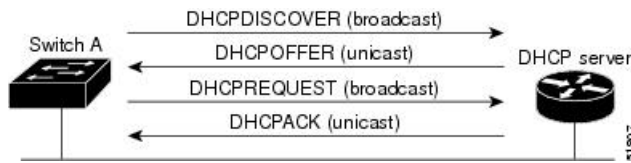
DHCP-based autoconfiguration replaces the BOOTP client functionality on your switch.

## DHCP Client Request Process

When you boot up your switch, the DHCP client is invoked and requests configuration information from a DHCP server when the configuration file is not present on the switch. If the configuration file is present and the configuration includes the **ip address dhcp** interface configuration command on specific routed interfaces, the DHCP client is invoked and requests the IP address information for those interfaces.

This is the sequence of messages that are exchanged between the DHCP client and the DHCP server.

Figure 1: DHCP Client and Server Message Exchange



The client, Switch A, broadcasts a DHCPDISCOVER message to locate a DHCP server. The DHCP server offers configuration parameters (such as an IP address, subnet mask, gateway IP address, DNS IP address, a lease for the IP address, and so forth) to the client in a DHCPOFFER unicast message.

In a DHCPREQUEST broadcast message, the client returns a formal request for the offered configuration information to the DHCP server. The formal request is broadcast so that all other DHCP servers that received the DHCPDISCOVER broadcast message from the client can reclaim the IP addresses that they offered to the client.

The DHCP server confirms that the IP address has been allocated to the client by returning a DHCPACK unicast message to the client. With this message, the client and server are bound, and the client uses configuration information received from the server. The amount of information the switch receives depends on how you configure the DHCP server.

If the configuration parameters sent to the client in the DHCPOFFER unicast message are invalid (a configuration error exists), the client returns a DHCPDECLINE broadcast message to the DHCP server.

The DHCP server sends the client a DHCPNAK denial broadcast message, which means that the offered configuration parameters have not been assigned, that an error has occurred during the negotiation of the parameters, or that the client has been slow in responding to the DHCPOFFER message (the DHCP server assigned the parameters to another client).

A DHCP client might receive offers from multiple DHCP or BOOTP servers and can accept any of the offers; however, the client usually accepts the first offer it receives. The offer from the DHCP server is not a guarantee that the IP address is allocated to the client; however, the server usually reserves the address until the client has had a chance to formally request the address. If the switch accepts replies from a BOOTP server and configures itself, the switch broadcasts, instead of unicasts, TFTP requests to obtain the switch configuration file.

The DHCP hostname option allows a group of switches to obtain hostnames and a standard configuration from the central management DHCP server. A client (switch) includes in its DHCPDISCOVER message an option 12 field used to request a hostname and other configuration parameters from the DHCP server. The configuration files on all clients are identical except for their DHCP-obtained hostnames.

If a client has a default hostname (the **hostname name** global configuration command is not configured or the **no hostname** global configuration command is entered to remove the hostname), the DHCP hostname option is not included in the packet when you enter the **ip address dhcp** interface configuration command. In this case, if the client receives the DHCP hostname option from the DHCP interaction while acquiring an IP address for an interface, the client accepts the DHCP hostname option and sets the flag to show that the system now has a hostname configured.

## DHCP-based Autoconfiguration and Image Update

You can use the DHCP image upgrade features to configure a DHCP server to download both a new image and a new configuration file to one or more switches in a network. Simultaneous image and configuration upgrade for all switches in the network helps ensure that each new switch added to a network receives the same image and configuration.

There are two types of DHCP image upgrades: DHCP autoconfiguration and DHCP auto-image update.

## Restrictions for DHCP-based Autoconfiguration

- The DHCP-based autoconfiguration with a saved configuration process stops if there is not at least one Layer 3 interface in an up state without an assigned IP address in the network.
- Unless you configure a timeout, the DHCP-based autoconfiguration with a saved configuration feature tries indefinitely to download an IP address.
- The auto-install process stops if a configuration file cannot be downloaded or if the configuration file is corrupted.
- The configuration file that is downloaded from TFTP is merged with the existing configuration in the running configuration but is not saved in the NVRAM unless you enter the **write memory** or **copy running-configuration startup-configuration** privileged EXEC command. If the downloaded configuration is saved to the startup configuration, the feature is not triggered during subsequent system restarts.

## DHCP Autoconfiguration

DHCP autoconfiguration downloads a configuration file to one or more switches in your network from a DHCP server. The downloaded configuration file becomes the running configuration of the switch. It does not over write the bootup configuration saved in the flash, until you reload the switch.

## DHCP Auto-Image Update

You can use DHCP auto-image upgrade with DHCP autoconfiguration to download both a configuration and a new image to one or more switches in your network. The switch (or switches) downloading the new configuration and the new image can be blank (or only have a default factory configuration loaded).

If the new configuration is downloaded to a switch that already has a configuration, the downloaded configuration is appended to the configuration file stored on the switch. (Any existing configuration is not overwritten by the downloaded one.)

To enable a DHCP auto-image update on the switch, the TFTP server where the image and configuration files are located must be configured with the correct option 67 (the configuration filename), option 66 (the DHCP server hostname) option 150 (the TFTP server address), and option 125 (description of the Cisco IOS image file) settings.

After you install the switch in your network, the auto-image update feature starts. The downloaded configuration file is saved in the running configuration of the switch, and the new image is downloaded and installed on the switch. When you reboot the switch, the configuration is stored in the saved configuration on the switch.

## DHCP Server Configuration Guidelines

Follow these guidelines if you are configuring a device as a DHCP server:

- You should configure the DHCP server with reserved leases that are bound to each switch by the switch hardware address.
- If you want the switch to receive IP address information, you must configure the DHCP server with these lease options:
  - IP address of the client (required)

- Subnet mask of the client (required)
- DNS server IP address (optional)
- Router IP address (default gateway address to be used by the switch) (required)
- If you want the switch to receive the configuration file from a TFTP server, you must configure the DHCP server with these lease options:
  - TFTP server name (required)
  - Boot filename (the name of the configuration file that the client needs) (recommended)
  - Hostname (optional)
- Depending on the settings of the DHCP server, the switch can receive IP address information, the configuration file, or both.
- If you do not configure the DHCP server with the lease options described previously, it replies to client requests with only those parameters that are configured. If the IP address and the subnet mask are not in the reply, the switch is not configured. If the router IP address or the TFTP server name are not found, the switch might send broadcast, instead of unicast, TFTP requests. Unavailability of other lease options does not affect autoconfiguration.
- The switch can act as a DHCP server. By default, the Cisco IOS DHCP server and relay agent features are enabled on your switch but are not configured. (These features are not operational.)

## Purpose of the TFTP Server

Based on the DHCP server configuration, the switch attempts to download one or more configuration files from the TFTP server. If you configured the DHCP server to respond to the switch with all the options required for IP connectivity to the TFTP server, and if you configured the DHCP server with a TFTP server name, address, and configuration filename, the switch attempts to download the specified configuration file from the specified TFTP server.

If you did not specify the configuration filename, the TFTP server, or if the configuration file could not be downloaded, the switch attempts to download a configuration file by using various combinations of filenames and TFTP server addresses. The files include the specified configuration filename (if any) and these files: `network-config`, `cisconet.cfg`, `hostname.config`, or `hostname.cfg`, where *hostname* is the switch's current hostname. The TFTP server addresses used include the specified TFTP server address (if any) and the broadcast address (255.255.255.255).

For the switch to successfully download a configuration file, the TFTP server must contain one or more configuration files in its base directory. The files can include these files:

- The configuration file named in the DHCP reply (the actual switch configuration file).
- The `network-config` or the `cisconet.cfg` file (known as the default configuration files).
- The `router-config` or the `ciscortr.cfg` file (These files contain commands common to all switches. Normally, if the DHCP and TFTP servers are properly configured, these files are not accessed.)

If you specify the TFTP server name in the DHCP server-lease database, you must also configure the TFTP server name-to-IP-address mapping in the DNS-server database.



If the TFTP server to be used is on a different LAN from the switch, or if it is to be accessed by the switch through the broadcast address (which occurs if the DHCP server response does not contain all the required information described previously), a relay must be configured to forward the TFTP packets to the TFTP server. The preferred solution is to configure the DHCP server with all the required information.

## Purpose of the DNS Server

The DHCP server uses the DNS server to resolve the TFTP server name to an IP address. You must configure the TFTP server name-to-IP address map on the DNS server. The TFTP server contains the configuration files for the switch.

You can configure the IP addresses of the DNS servers in the lease database of the DHCP server from where the DHCP replies will retrieve them. You can enter up to two DNS server IP addresses in the lease database.

The DNS server can be on the same LAN or on a different LAN from the switch. If it is on a different LAN, the switch must be able to access it through a router.

## How to Obtain Configuration Files

Depending on the availability of the IP address and the configuration filename in the DHCP reserved lease, the switch obtains its configuration information in these ways:

- The IP address and the configuration filename is reserved for the switch and provided in the DHCP reply (one-file read method).

The switch receives its IP address, subnet mask, TFTP server address, and the configuration filename from the DHCP server. The switch sends a unicast message to the TFTP server to retrieve the named configuration file from the base directory of the server and upon receipt, it completes its boot up process.

- The IP address and the configuration filename is reserved for the switch, but the TFTP server address is not provided in the DHCP reply (one-file read method).

The switch receives its IP address, subnet mask, and the configuration filename from the DHCP server. The switch sends a broadcast message to a TFTP server to retrieve the named configuration file from the base directory of the server, and upon receipt, it completes its boot-up process.

- Only the IP address is reserved for the switch and provided in the DHCP reply. The configuration filename is not provided (two-file read method).

The switch receives its IP address, subnet mask, and the TFTP server address from the DHCP server. The switch sends a unicast message to the TFTP server to retrieve the `network-config` or `cisconet.cfg` default configuration file. (If the `network-config` file cannot be read, the switch reads the `cisconet.cfg` file.)

The default configuration file contains the hostnames-to-IP-address mapping for the switch. The switch fills its host table with the information in the file and obtains its hostname. If the hostname is not found in the file, the switch uses the hostname in the DHCP reply. If the hostname is not specified in the DHCP reply, the switch uses the default *Switch* as its hostname.

After obtaining its hostname from the default configuration file or the DHCP reply, the switch reads the configuration file that has the same name as its hostname (*hostname-config* or *hostname.cfg*, depending on whether `network-config` or `cisconet.cfg` was read earlier) from the TFTP server. If the `cisconet.cfg` file is read, the filename of the host is truncated to eight characters.

If the switch cannot read the `network-config`, `cisconet.cfg`, or the hostname file, it reads the `router-config` file. If the switch cannot read the `router-config` file, it reads the `ciscortr.cfg` file.



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**Note** The switch broadcasts TFTP server requests if the TFTP server is not obtained from the DHCP replies, if all attempts to read the configuration file through unicast transmissions fail, or if the TFTP server name cannot be resolved to an IP address.

---

## How to Control Environment Variables

With a normally operating switch, you enter the boot loader mode only through the console connection configured for 9600 bps. Unplug the switch power cord, and press the **Mode** button while reconnecting the power cord. You can release the **Mode** button after all the amber system LEDs turn on and remain solid. The boot loader switch prompt then appears.

The switch boot loader software provides support for nonvolatile environment variables, which can be used to control how the boot loader, or any other software running on the system, operates. Boot loader environment variables are similar to environment variables that can be set on UNIX or DOS systems.

Environment variables that have values are stored in flash memory outside of the flash file system.

Each line in these files contains an environment variable name and an equal sign followed by the value of the variable. A variable has no value if it is not present; it has a value if it is listed even if the value is a null string. A variable that is set to a null string (for example, “”) is a variable with a value. Many environment variables are predefined and have default values.

You can change the settings of the environment variables by accessing the boot loader or by using Cisco IOS commands. Under normal circumstances, it is not necessary to alter the setting of the environment variables.

## Common Environment Variables

This table describes the function of the most common environment variables.

**Table 1: Common Environment Variables**

| Variable    | Boot Loader Command  | Cisco IOS Global Configuration Command  |
|-------------|--|---|
| BOOT        | <p><b>set BOOT</b> <i>filesystem :/file-url ...</i></p> <p>A semicolon-separated list of executable files to try to load and execute when automatically booting.</p>   | <p><b>boot system</b> <i>{filesystem : /file-url ...   switch {number   all}}</i></p> <p>Specifies the Cisco IOS image to load during the next boot cycle and the stack members on which the image is loaded. This command changes the setting of the BOOT environment variable.</p> <p>The package provisioning file, also referred to as the <i>packages.conf</i> file, is used by the system to determine which software packages to activate during boot up.</p> <ul style="list-style-type: none"> <li>When booting in installed mode, the package provisioning file specified in the <b>boot</b> command is used to determine which packages to activate. For example <b>boot flash:packages.conf</b>.</li> <li>When booting in bundle mode, the package provisioning file contained in the booted bundle is used to activate the packages included in the bundle. For example, <b>boot flash:image.bin</b>.</li> </ul> |
| MANUAL_BOOT | <p><b>set MANUAL_BOOT</b> <b>yes</b></p> <p>Decides whether the switch automatically or manually boots.</p> <p>Valid values are 1, yes, 0, and no. If it is set to no or 0, the boot loader attempts to automatically boot up the system. If it is set to anything else, you must manually boot up the switch from the boot loader mode.</p> | <p><b>boot manual</b></p> <p>Enables manually booting the switch during the next boot cycle and changes the setting of the MANUAL_BOOT environment variable.</p> <p>The next time you reboot the system, the switch is in boot loader mode. To boot up the system, use the <b>boot flash:filesystem :/file-url</b> boot loader command, and specify the name of the bootable image.</p>   |

| Variable        | Boot Loader Command   | Cisco IOS Global Configuration Command  |
|-----------------|---|---|
| CONFIG_FILE     | <b>set CONFIG_FILE flash:/<br/>file-url</b><br>Changes the filename that Cisco IOS uses to read and write a nonvolatile copy of the system configuration. | <b>boot config-file flash:/ file-url</b><br>Specifies the filename that Cisco IOS uses to read and write a nonvolatile copy of the system configuration. This command changes the CONFIG_FILE environment variable. |
| SWITCH_NUMBER   | <b>set SWITCH_NUMBER<br/>stack-member-number</b><br>Changes the member number of a stack member.  | <b>switch current-stack-member-number<br/>renumber new-stack-member-number</b><br>Changes the member number of a stack member.  |
| SWITCH_PRIORITY | <b>set SWITCH_PRIORITY<br/>stack-member-number</b><br>Changes the priority value of a stack member.   | <b>switch stack-member-number priority<br/>priority-number</b><br>Changes the priority value of a stack member.   |
| BAUD            | <b>set BAUD baud-rate</b>   | <b>line console 0<br/>speed speed-value</b><br>Configures the baud rate.  |
| ENABLE_BREAK    | <b>set ENABLE_BREAK yes/no</b>  | <b>boot enable-break switch yes/no</b><br>Enables a break to the auto-boot cycle. You have 5 seconds to enter the <b>break</b> command.   |

## Scheduled Reload of the Software Image

You can schedule a reload of the software image to occur on the switch at a later time (for example, late at night or during the weekend when the switch is used less), or you can synchronize a reload network-wide (for example, to perform a software upgrade on all switches in the network).

You have these reload options:

- Reload of the software to take affect in the specified minutes or hours and minutes. The reload must take place within approximately 24 hours. You can specify the reason for the reload in a string up to 255 characters in length.
- Reload of the software to take place at the specified time (using a 24-hour clock). If you specify the month and day, the reload is scheduled to take place at the specified time and date. If you do not specify the month and day, the reload takes place at the specified time on the current day (if the specified time is later than the current time) or on the next day (if the specified time is earlier than the current time). Specifying 00:00 schedules the reload for midnight.

The **reload** command halts the system. If the system is not set to manually boot up, it reboots itself.

If your switch is configured for manual booting, do not reload it from a virtual terminal. This restriction prevents the switch from entering the boot loader mode and then taking it from the remote user's control.

If you modify your configuration file, the switch prompts you to save the configuration before reloading. During the save operation, the system requests whether you want to proceed with the save if the CONFIG\_FILE environment variable points to a startup configuration file that no longer exists. If you proceed in this situation, the system enters setup mode upon reload.

To cancel a previously scheduled reload, use the **reload cancel** privileged EXEC command.

## How to Perform Switch Setup Configuration

Using DHCP to download a new image and a new configuration to a switch requires that you configure at least two switches. One switch acts as a DHCP and TFTP server and the second switch (client) is configured to download either a new configuration file or a new configuration file and a new image file.

### Configuring DHCP Autoconfiguration (Only Configuration File)

This task describes how to configure DHCP autoconfiguration of the TFTP and DHCP settings on an existing switch in the network so that it can support the autoconfiguration of a new switch.

#### Procedure

|               | Command or Action   | Purpose   |
|---------------|---|---|
| <b>Step 1</b> | <b>configure terminal</b><br><b>Example:</b><br><br>Switch# <b>configure terminal</b>                   | Enters global configuration mode.   |
| <b>Step 2</b> | <b>ip dhcp pool <i>poolname</i></b><br><b>Example:</b><br><br>Switch(config)# <b>ip dhcp pool pool</b>  | Creates a name for the DHCP server address pool, and enters DHCP pool configuration mode. |
| <b>Step 3</b> | <b>boot <i>filename</i></b><br><b>Example:</b><br><br>Switch(dhcp-config)# <b>boot config-boot.text</b> | Specifies the name of the configuration file that is used as a boot image.                |
| <b>Step 4</b> | <b>network <i>network-number mask prefix-length</i></b><br><b>Example:</b>                              | Specifies the subnet network number and mask of the DHCP address pool.                    |

|                | Command or Action  | Purpose  |
|----------------|--|--|
|                | Switch(dhcp-config)# <b>network</b> 10.10.10.0<br>255.255.255.0  | <b>Note</b> The prefix length specifies the number of bits that comprise the address prefix. The prefix is an alternative way of specifying the network mask of the client. The prefix length must be preceded by a forward slash (/). |
| <b>Step 5</b>  | <b>default-router</b> <i>address</i><br><b>Example:</b><br>Switch(dhcp-config)# <b>default-router</b><br>10.10.10.1              | Specifies the IP address of the default router for a DHCP client.  |
| <b>Step 6</b>  | <b>option 150</b> <i>address</i><br><b>Example:</b><br>Switch(dhcp-config)# <b>option 150</b><br>10.10.10.1                      | Specifies the IP address of the TFTP server.   |
| <b>Step 7</b>  | <b>exit</b><br><b>Example:</b><br>Switch(dhcp-config)# <b>exit</b>   | Returns to global configuration mode.  |
| <b>Step 8</b>  | <b>tftp-server flash:filename.text</b><br><b>Example:</b><br>Switch(config)# <b>tftp-server</b><br><b>flash:config-boot.text</b> | Specifies the configuration file on the TFTP server.   |
| <b>Step 9</b>  | <b>interface</b> <i>interface-id</i><br><b>Example:</b><br>Switch(config)# <b>interface</b><br><b>gigabitethernet1/0/4</b>       | Specifies the address of the client that will receive the configuration file.  |
| <b>Step 10</b> | <b>no switchport</b><br><b>Example:</b><br>Switch(config-if)# <b>no switchport</b>   | Puts the interface into Layer 3 mode.  |

|                | Command or Action   | Purpose  |
|----------------|---|--|
| <b>Step 11</b> | <b>ip address</b> <i>address mask</i><br><b>Example:</b><br><pre>Switch(config-if)# ip address 10.10.10.1 255.255.255.0</pre> | Specifies the IP address and mask for the interface. |
| <b>Step 12</b> | <b>end</b><br><b>Example:</b><br><pre>Switch(config-if)# end</pre>  | Returns to privileged EXEC mode.                     |

**Related Topics**

[Example: Configuring a Switch as a DHCP Server](#), on page 31

## Configuring DHCP Auto-Image Update (Configuration File and Image)

This task describes DHCP autoconfiguration to configure TFTP and DHCP settings on an existing switch to support the installation of a new switch.

**Before you begin**

You must first create a text file (for example, `autoinstall_dhcp`) that will be uploaded to the switch. In the text file, put the name of the image that you want to download (forexample, `c3750e-ipservices-mz.122-44.3.SE.tar``c3750x-ipservices-mz.122-53.3.SE2.tar`). This image must be a tar and not a bin file.

**Procedure**

|               | Command or Action   | Purpose   |
|---------------|---|---|
| <b>Step 1</b> | <b>configure terminal</b><br><b>Example:</b><br><pre>Switch# configure terminal</pre>                   | Enters global configuration mode.   |
| <b>Step 2</b> | <b>ip dhcp pool</b> <i>poolname</i><br><b>Example:</b><br><pre>Switch(config)# ip dhcp pool pool1</pre> | Creates a name for the DHCP server address pool and enter DHCP pool configuration mode. |
| <b>Step 3</b> | <b>boot</b> <i>filename</i><br><b>Example:</b><br><pre>Switch(dhcp-config)# boot</pre>                  | Specifies the name of the file that is used as a boot image.                            |

|               | Command or Action   | Purpose   |
|---------------|---|---|
|               | <code>config-boot.text</code>   |   |
| <b>Step 4</b> | <p><b>network</b> <i>network-number mask prefix-length</i></p> <p><b>Example:</b></p> <pre>Switch(dhcp-config)# network 10.10.10.0 255.255.255.0</pre>              | <p>Specifies the subnet network number and mask of the DHCP address pool.</p> <p><b>Note</b> The prefix length specifies the number of bits that comprise the address prefix. The prefix is an alternative way of specifying the network mask of the client. The prefix length must be preceded by a forward slash (/).</p> |
| <b>Step 5</b> | <p><b>default-router</b> <i>address</i></p> <p><b>Example:</b></p> <pre>Switch(dhcp-config)# default-router 10.10.10.1</pre>  | Specifies the IP address of the default router for a DHCP client.   |
| <b>Step 6</b> | <p><b>option 150</b> <i>address</i></p> <p><b>Example:</b></p> <pre>Switch(dhcp-config)# option 150 10.10.10.1</pre>  | Specifies the IP address of the TFTP server.  |
| <b>Step 7</b> | <p><b>option 125</b> <i>hex</i></p> <p><b>Example:</b></p> <pre>Switch(dhcp-config)# option 125 hex 0000.0009.0a05.08661.7574.6e69.6e73.7461.6c6c.5f64.686370</pre> | Specifies the path to the text file that describes the path to the image file.  |
| <b>Step 8</b> | <p><b>copy tftp flash</b> <i>filename.txt</i></p> <p><b>Example:</b></p> <pre>Switch(config)# copy tftp flash image.bin</pre>                                       | Uploads the text file to the switch.  |
| <b>Step 9</b> | <p><b>copy tftp flash</b> <i>imagenamename.bin</i></p> <p><b>Example:</b></p> <pre>Switch(config)# copy tftp flash image.bin</pre>                                  | Uploads the tar file for the new image to the switch.   |



|                | Command or Action  | Purpose   |
|----------------|--|---|
| <b>Step 10</b> | <b>exit</b><br><b>Example:</b><br><br>Switch(dhcp-config)# <b>exit</b>   | Returns to global configuration mode.   |
| <b>Step 11</b> | <b>tftp-server flash: config.text</b><br><b>Example:</b><br><br>Switch(config)# <b>tftp-server flash:config-boot.text</b>  | Specifies the Cisco IOS configuration file on the TFTP server.                |
| <b>Step 12</b> | <b>tftp-server flash: imagename.bin</b><br><b>Example:</b><br><br>Switch(config)# <b>tftp-server flash:image.bin</b>       | Specifies the image name on the TFTP server.                                  |
| <b>Step 13</b> | <b>tftp-server flash: filename.txt</b><br><b>Example:</b><br><br>Switch(config)# <b>tftp-server flash:boot-config.text</b> | Specifies the text file that contains the name of the image file to download  |
| <b>Step 14</b> | <b>interface interface-id</b><br><b>Example:</b><br><br>Switch(config)# <b>interface gigabitEthernet1/0/4</b>              | Specifies the address of the client that will receive the configuration file. |
| <b>Step 15</b> | <b>no switchport</b><br><b>Example:</b><br><br>Switch(config-if)# <b>no switchport</b>                                     | Puts the interface into Layer 3 mode.   |
| <b>Step 16</b> | <b>ip address address mask</b><br><b>Example:</b><br><br>Switch(config-if)# <b>ip address 10.10.10.1 255.255.255.0</b>     | Specifies the IP address and mask for the interface.                          |
| <b>Step 17</b> | <b>end</b><br><b>Example:</b>  | Returns to privileged EXEC mode.  |

|                | Command or Action  | Purpose  |
|----------------|--|--|
|                | <code>Switch(config-if) # end</code>   |  |
| <b>Step 18</b> | <b>copy running-config startup-config</b><br><b>Example:</b><br><code>Switch(config-if) # end</code> | (Optional) Saves your entries in the configuration file. |

**Related Topics**

[Example: Configuring DHCP Auto-Image Update](#), on page 31

## Configuring the Client to Download Files from DHCP Server

**Note**

You should only configure and enable the Layer 3 interface. Do not assign an IP address or DHCP-based autoconfiguration with a saved configuration.

**Procedure**

|               | Command or Action  | Purpose  |
|---------------|--|--|
| <b>Step 1</b> | <b>configure terminal</b><br><b>Example:</b><br><code>Switch# configure terminal</code>  | Enters global configuration mode.  |
| <b>Step 2</b> | <b>boot host dhcp</b><br><b>Example:</b><br><code>Switch(conf) # boot host dhcp</code>   | Enables autoconfiguration with a saved configuration.  |
| <b>Step 3</b> | <b>boot host retry timeout <i>timeout-value</i></b><br><b>Example:</b><br><code>Switch(conf) # boot host retry timeout 300</code>                                  | (Optional) Sets the amount of time the system tries to download a configuration file.<br><b>Note</b> If you do not set a timeout, the system will try indefinitely to obtain an IP address from the DHCP server. |
| <b>Step 4</b> | <b>banner config-save ^C <i>warning-message</i> ^C</b><br><b>Example:</b><br><code>Switch(conf) # banner config-save ^C Caution - Saving Configuration File</code> | (Optional) Creates warning messages to be displayed when you try to save the configuration file to NVRAM.  |

|               | Command or Action  | Purpose                          |
|---------------|--|----------------------------------|
|               | to NVRAM May Cause You to No longer Automatically Download Configuration Files at Reboot^C |                                  |
| <b>Step 5</b> | <b>end</b><br><b>Example:</b><br><br>Switch(config-if)# <b>end</b>                         | Returns to privileged EXEC mode. |
| <b>Step 6</b> | <b>show boot</b><br><b>Example:</b><br><br>Switch# <b>show boot</b>                        | Verifies the configuration.      |

**Related Topics**

[Example: Configuring a Switch to Download Configurations from a DHCP Server](#), on page 32

## Manually Assigning IP Information to Multiple SVIs

This task describes how to manually assign IP information to multiple switched virtual interfaces (SVIs):

**Procedure**

|               | Command or Action   | Purpose   |
|---------------|---|---|
| <b>Step 1</b> | <b>configure terminal</b><br><b>Example:</b><br><br>Switch# <b>configure terminal</b>   | Enters global configuration mode.   |
| <b>Step 2</b> | <b>interface vlan <i>vlan-id</i></b><br><b>Example:</b><br><br>Switch(config)# <b>interface vlan 99</b>                                   | Enters interface configuration mode, and enters the VLAN to which the IP information is assigned. The range is 1 to 4094. |
| <b>Step 3</b> | <b>ip address <i>ip-address subnet-mask</i></b><br><b>Example:</b><br><br>Switch(config-vlan)# <b>ip address 10.10.10.2 255.255.255.0</b> | Enters the IP address and subnet mask.  |
| <b>Step 4</b> | <b>exit</b><br><b>Example:</b>  | Returns to global configuration mode.   |

|               | Command or Action   | Purpose  |
|---------------|---|--|
|               | Switch(config-vlan)# <b>exit</b>  |  |
| <b>Step 5</b> | <b>ip default-gateway ip-address</b><br><b>Example:</b><br>Switch(config)# <b>ip default-gateway 10.10.10.1</b> | <p>Enters the IP address of the next-hop router interface that is directly connected to the switch where a default gateway is being configured. The default gateway receives IP packets with unresolved destination IP addresses from the switch.</p> <p>Once the default gateway is configured, the switch has connectivity to the remote networks with which a host needs to communicate.</p> <p><b>Note</b> When your switch is configured to route with IP, it does not need to have a default gateway set.</p> <p><b>Note</b> The switch capwap relays on default-gateway configuration to support routed access point join the switch.</p> |
| <b>Step 6</b> | <b>end</b><br><b>Example:</b><br>Switch(config)# <b>end</b>   | Returns to privileged EXEC mode.   |
| <b>Step 7</b> | <b>show interfaces vlan vlan-id</b><br><b>Example:</b><br>Switch# <b>show interfaces vlan 99</b>                | Verifies the configured IP address.  |
| <b>Step 8</b> | <b>show ip redirects</b><br><b>Example:</b><br>Switch# <b>show ip redirects</b>                                 | Verifies the configured default gateway.   |

## Modifying the Switch Startup Configuration

### Specifying the Filename to Read and Write the System Configuration

By default, the Cisco IOS software uses the config.text file to read and write a nonvolatile copy of the system configuration. However, you can specify a different filename, which will be loaded during the next boot cycle.

**Before you begin**

Use a standalone switch for this task.

**Procedure**

|               | Command or Action   | Purpose  |
|---------------|---|--|
| <b>Step 1</b> | <b>configure terminal</b><br><b>Example:</b><br>Switch# <b>configure terminal</b>                                 | Enters global configuration mode.  |
| <b>Step 2</b> | <b>boot flash:/file-url</b><br><b>Example:</b><br>Switch(config)# <b>boot flash:config.text</b>                   | Specifies the configuration file to load during the next boot cycle.<br><br><i>file-url</i> —The path (directory) and the configuration filename.<br><br>Filenames and directory names are case-sensitive. |
| <b>Step 3</b> | <b>end</b><br><b>Example:</b><br>Switch(config)# <b>end</b>   | Returns to privileged EXEC mode.   |
| <b>Step 4</b> | <b>show boot</b><br><b>Example:</b><br>Switch# <b>show boot</b>   | Verifies your entries.<br><br>The <b>boot</b> global configuration command changes the setting of the CONFIG_FILE environment variable.  |
| <b>Step 5</b> | <b>copy running-config startup-config</b><br><b>Example:</b><br>Switch# <b>copy running-config startup-config</b> | (Optional) Saves your entries in the configuration file.   |

**Manually Booting the Switch**

By default, the switch automatically boots up; however, you can configure it to manually boot up.

**Before you begin**

Use a standalone switch for this task.

## Procedure

|               | Command or Action   | Purpose  |
|---------------|---|--|
| <b>Step 1</b> | <b>configure terminal</b><br><b>Example:</b><br>Switch# <code>configure terminal</code>                                 | Enters global configuration mode.  |
| <b>Step 2</b> | <b>boot manual</b><br><b>Example:</b><br>Switch(config)# <code>boot manual</code>                                       | Enables the switch to manually boot up during the next boot cycle.   |
| <b>Step 3</b> | <b>end</b><br><b>Example:</b><br>Switch(config)# <code>end</code>   | Returns to privileged EXEC mode.   |
| <b>Step 4</b> | <b>show boot</b><br><b>Example:</b><br>Switch# <code>show boot</code>   | <p>Verifies your entries.</p> <p>The <b>boot manual</b> global command changes the setting of the MANUAL_BOOT environment variable.</p> <p>The next time you reboot the system, the switch is in boot loader mode, shown by the <i>switch:</i> prompt. To boot up the system, use the <b>boot filesystem:/file-url</b> boot loader command.</p> <ul style="list-style-type: none"> <li>• <i>filesystem:</i>—Uses flash: for the system board flash device.<br/>           switch: <code>boot flash:</code></li> <li>• For <i>file-url</i>—Specifies the path (directory) and the name of the bootable image.</li> </ul> <p>Filenames and directory names are case-sensitive.</p> |
| <b>Step 5</b> | <b>copy running-config startup-config</b><br><b>Example:</b><br>Switch# <code>copy running-config startup-config</code> | (Optional) Saves your entries in the configuration file.   |

## Booting the Switch in Installed Mode

### Procedure

|        | Command or Action  | Purpose   |
|--------|--|---|
| Step 1 | <p><b>cp</b> <i>source_file_path</i> <i>destination_file_path</i></p> <p><b>Example:</b></p> <pre>Switch# copy ftp://10.0.0.6/cat3k_caa-universalk9.SSA.03.12.02.EXP.15-9.37.EXP.bin flash:</pre>  | (Optional) Copies the bin file ( <i>image.bin</i> ) from the FTP or TFTP server to flash or USB flash.  |
| Step 2 | <p><b>software expand file</b> <i>source_file_path</i></p> <p><b>Example:</b></p> <p>Expanding the bin file from the TFTP server:</p> <pre>Switch# software expand file ftp://10.0.0.2/cat3k_caa-universalk9.SSA.03.09.37.EXP.150-9.37.EXP.bin to flash: Preparing expand operation ... [1]: Downloading file ftp://10.0.0.2/cat3k_caa-universalk9.SSA.03.09.37.EXP.150-9.37.EXP.bin to active switch 1 [1]: Finished downloading file ftp://10.0.0.2/cat3k_caa-universalk9.SSA.03.09.37.EXP.150-9.37. EXP.bin to active switch 1 [1]: Copying software from active switch 1 to switch 2 [1]: Finished copying software to switch 2 [1 2]: Expanding bundle cat3k_caa-universalk9.SSA.03.09.37.EXP.150-9.37.EXP.bin [1 2]: Copying package files [1 2]: Package files copied [1 2]: Finished expanding bundle cat3k_caa-universalk9.SSA.03.09.37.EXP.150-9.37.EXP.bin   18 -rw-      74387812   Dec 7 2012 05:55:43 +00:00 cat3k_caa-base.SSA.03.09.37.EXP.pkg  19 -rw-      2738868    Dec 7 2012 05:55:44 +00:00 cat3k_caa-drivers.SSA.03.09.37.EXP.pkg  20 -rw-      32465772   Dec 7 2012 05:55:44 +00:00 cat3k_caa-infra.SSA.03.09.37.EXP.pkg  21 -rw-      30389036   Dec 7 2012 05:55:44 +00:00 cat3k_caa-iosd-universalk9.SSA.150-9.37.EXP.pkg   22 -rw-      18342624   Dec 7 2012 05:55:44 +00:00 cat3k_caa-platform.SSA.03.09.37.EXP.pkg  23 -rw-      63374028   Dec 7 2012 05:55:44 +00:00 cat3k_caa-wcm.SSA.10.0.10.14.pkg  17 -rw-         1239    Dec 7 2012 05:56:29 +00:00 packages.conf</pre> | <p>Expands the bin file stored in flash, FTP, TFTP, HTTP, or HTTPS server on the booted switch.</p> <p><b>Note</b> Ensure that the <code>packages.conf</code> file is available in the expanded list.</p> |

|               | Command or Action   | Purpose   |
|---------------|---|---|
| <b>Step 3</b> | <b>reload</b><br><b>Example:</b><br>Switch: <b>reload</b>   | Reloads the switch.<br><b>Note</b> You can boot the switch manually or automatically using the <code>packages.conf</code> file. If you are booting manually, you can proceed to Step 4. Otherwise, the switch boots up automatically. |
| <b>Step 4</b> | <b>boot flash:packages.conf</b><br><b>Example:</b><br>switch: <b>boot flash:packages.conf</b>   | Boots the switch with the <code>packages.conf</code> file.  |
| <b>Step 5</b> | <b>show version</b><br><b>Example:</b><br>switch# <b>show version</b><br><br>Switch Ports Model SW<br>Version SW Image Mode<br>-----<br>-----<br>----<br>1 6 WS-C3850-6DS-S<br>03.09.26.EXP ct3850-ipervicesk9<br>INSTALL | Verifies that the switch is in the <b>INSTALL</b> mode.   |

## Booting the Switch in Bundle Mode

There are several methods by which you can boot the switch—either by copying the bin file from the TFTP server and then boot the switch, or by booting the switch straight from flash or USB flash using the commands **boot flash:<image.bin>** or **boot usbflash0:<image.bin>**.

The following procedure explains how to boot the switch from the TFTP server in the bundle mode.

### Procedure

|               | Command or Action   | Purpose  |
|---------------|---|--|
| <b>Step 1</b> | <b>cp source_file_path destination_file_path</b><br><b>Example:</b><br>Switch# <b>copy</b><br><del>tftp://10.0.0.6/ct3850-ipservicesk9-03.09.26.EXP-15-12-02.bin</del><br><b>flash:</b> | (Optional) Copies the bin file ( <code>image.bin</code> ) from the FTP or TFTP server to flash or USB flash. |
| <b>Step 2</b> | <b>switch:BOOT=&lt;source path of .bin file&gt;</b><br><b>Example:</b><br>Switch:<br><del>switch: tftp://10.0.0.6/ct3850-ipservicesk9-03.09.26.EXP-15-12-02.bin</del>                   | Sets the boot parameters.  |
| <b>Step 3</b> | <b>boot</b>   | Boots the switch.  |



|               | Command or Action  | Purpose  |
|---------------|--|--|
|               | <b>Example:</b><br>switch: <code>boot</code>   |  |
| <b>Step 4</b> | <b>show version</b><br><br><b>Example:</b><br><pre> switch# show version Switch Ports Model          SW Version      SW Image          Mode ----- ----- -----       1 6      WS-C3850-6DS-S 03.09.40.EXP   ct3850-ipservicesk9 BUNDLE                     </pre> | Verifies that the switch is in the <b>BUNDLE</b> mode. |

## Booting a Specific Software Image On a Switch Stack

By default, the switch attempts to automatically boot up the system using information in the BOOT environment variable. If this variable is not set, the switch attempts to load and execute the first executable image it can by performing a recursive, depth-first search throughout the flash file system. In a depth-first search of a directory, each encountered subdirectory is completely searched before continuing the search in the original directory. However, you can specify a specific image to boot up.

### Procedure

|               | Command or Action  | Purpose   |
|---------------|--|---|
| <b>Step 1</b> | <b>configure terminal</b><br><br><b>Example:</b><br>Switch# <code>configure terminal</code>  | Enters global configuration mode.   |
| <b>Step 2</b> | <b>boot system switch {number   all}</b><br><br><b>Example:</b><br><pre> Switch(config)# boot system switch 2 flash:cat3850-universalk9.SSA.03.08.83.EMD.150-8.83.EMD.bin                     </pre> | (Optional) For switches in a stack, specifies the switch members on which the system image is loaded during the next boot cycle: <ul style="list-style-type: none"> <li>• Use <i>number</i> to specify a stack member. (Specify only one stack member.)</li> <li>• Use <b>all</b> to specify all stack members.</li> </ul> If you enter on a Catalyst 3750-X stack master or member, you can only specify the switch image for other Catalyst 3750-X stack members.<br><br>If you enter on a Catalyst 3750-E stack master or member, you can only specify the switch image for other Catalyst 3750-E stack members. |

|               | Command or Action   | Purpose   |
|---------------|---|---|
|               |   | If you want to specify the image for a Catalyst 3750 switch, enter this command on the Catalyst 3750 stack member.  |
| <b>Step 3</b> | <b>end</b><br><b>Example:</b><br><pre>Switch(config)# end</pre>   | Returns to privileged EXEC mode.  |
| <b>Step 4</b> | <b>show boot system</b><br><b>Example:</b><br><pre>Switch# show boot system</pre>                                     | <p>Verifies your entries.</p> <p>The <b>boot system</b> global command changes the setting of the BOOT environment variable.</p> <p>During the next boot cycle, the switch attempts to automatically boot up the system using information in the BOOT environment variable.</p> |
| <b>Step 5</b> | <b>copy running-config startup-config</b><br><b>Example:</b><br><pre>Switch# copy running-config startup-config</pre> | (Optional) Saves your entries in the configuration file.  |

## Configuring a Scheduled Software Image Reload

This task describes how to configure your switch to reload the software image at a later time.

### Procedure

|               | Command or Action  | Purpose  |
|---------------|--|--|
| <b>Step 1</b> | <b>configure terminal</b><br><b>Example:</b><br><pre>Switch# configure terminal</pre>  | Enters global configuration mode.  |
| <b>Step 2</b> | <b>copy running-config startup-config</b><br><b>Example:</b><br><pre>copy running-config startup-config</pre>                                | Saves your switch configuration information to the startup configuration before you use the <b>reload</b> command.   |
| <b>Step 3</b> | <b>reload in [hh:]mm [text]</b><br><b>Example:</b><br><pre>Switch(config)# reload in 12</pre> <p>System configuration has been modified.</p> | <p>Schedules a reload of the software to take affect in the specified minutes or hours and minutes. The reload must take place within approximately 24 days. You can specify the reason for the reload in a string up to 255 characters in length.</p> |

|               | Command or Action  | Purpose   |
|---------------|--|---|
|               | Save? [yes/no]: <b>y</b>   |   |
| <b>Step 4</b> | <b>reload at</b> <i>hh:mm</i> [ <i>month day</i>   <i>day month</i> ] [ <i>text</i> ]<br><b>Example:</b><br>Switch(config)# <b>reload at 14:00</b> | Specifies the time in hours and minutes for the reload to occur.<br><br><b>Note</b> Use the <b>at</b> keyword only if the switch system clock has been set (through Network Time Protocol (NTP), the hardware calendar, or manually). The time is relative to the configured time zone on the switch. To schedule reloads across several switches to occur simultaneously, the time on each switch must be synchronized with NTP. |
| <b>Step 5</b> | <b>reload cancel</b><br><b>Example:</b><br>Switch(config)# <b>reload cancel</b>  | Cancels a previously scheduled reload.  |
| <b>Step 6</b> | <b>show reload</b><br><b>Example:</b><br><b>show reload</b>  | Displays information about a previously scheduled reload or identifies if a reload has been scheduled on the switch.  |

## Monitoring Switch Setup Configuration

### Example: Verifying the Switch Running Configuration

```

Switch# show running-config
Building configuration...

Current configuration: 1363 bytes
!
version 12.4
no service pad
service timestamps debug uptime
service timestamps log uptime
no service password-encryption
!
hostname Stack1
!
enable secret 5 $1$ej9.$DMUvAUnZOAmvmgqBEzIxEO
!
.
<output truncated>
.
interface gigabitethernet6/0/2
mvr type source

```



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Software clause at DFARS sec. 252.227-7013.

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Cisco IOS Software, IOS-XE Software, Catalyst L3 Switch Software (CAT3K\_CAA-UNIVERSALK9-M),

Version 03.09.12.EMD EARLY DEPLOYMENT ENGINEERING NOVA\_WEEKLY BUILD, synced to  
DSGS\_PI2\_POSTPC\_FLO\_DSBUE7\_NG3K\_1105  
Copyright (c) 1986-2012 by Cisco Systems, Inc.  
Compiled Sun 04-Nov-12 22:53 by gereddy  
License level to iosd is ipservices

This example display software bootup in bundle mode:

switch: **boot flash:cat3k\_caa-universalk9.SSA.03.09.12.EMD.150-9.12.EMD.bin**

Reading full image into  
memory.....done  
Nova Bundle Image

-----  
Kernel Address : 0x6042ff38  
Kernel Size : 0x318412/3245074  
Initramfs Address : 0x6074834c  
Initramfs Size : 0xdc08e8/14420200  
Compression Format: .mzip

Bootable image at @ ram:0x6042ff38  
Bootable image segment 0 address range [0x81100000, 0x81b80000] is in range [0x80180000, 0x90000000].

File "flash:cat3k\_caa-universalk9.SSA.03.09.12.EMD.150-9.12.EMD.bin" uncompressed and  
installed, entry point: 0x811060f0  
Loading Linux kernel with entry point 0x811060f0 ...  
Bootloader: Done loading app on core\_mask: 0xf

### Launching Linux Kernel (flags = 0x5)

All packages are Digitally Signed  
Starting System Services  
Nov 7 09:45:49 %IOSXE-1-PLATFORM: process stack-mgr: %STACKMGR-1-DISC\_START: Switch 2 is  
starting stack discovery  
#####  
Nov 7 09:47:50 %IOSXE-1-PLATFORM: process stack-mgr: %STACKMGR-1-DISC\_DONE: Switch 2 has  
finished stack discovery  
Nov 7 09:47:50 %IOSXE-1-PLATFORM: process stack-mgr: %STACKMGR-1-SWITCH\_ADDED: Switch 2 has  
been added to the stack  
Nov 7 09:47:58 %IOSXE-1-PLATFORM: process stack-mgr: %STACKMGR-1-ACTIVE\_ELECTED: Switch 2  
has been elected ACTIVE

Restricted Rights Legend

Use, duplication, or disclosure by the Government is  
subject to restrictions as set forth in subparagraph  
(c) of the Commercial Computer Software - Restricted  
Rights clause at FAR sec. 52.227-19 and subparagraph  
(c) (1) (ii) of the Rights in Technical Data and Computer



```
tftp://192.0.2.47/cat3k/cat3k_caa-universalk9.SSA.03.09.12.EMD.150-9.12.EMD.bin...
Installing bundle
tftp://192.0.2.47/cat3k/cat3k_caa-universalk9.SSA.03.09.12.EMD.150-9.12.EMD.bin...
Verifying bundle
tftp://192.0.2.47/cat3k/cat3k_caa-universalk9.SSA.03.09.12.EMD.150-9.12.EMD.bin...
Package cat3k_caa-base.SSA.03.09.12.EMD.pkg is Digitally Signed
Package cat3k_caa-drivers.SSA.03.09.12.EMD.pkg is Digitally Signed
Package cat3k_caa-infra.SSA.03.09.12.EMD.pkg is Digitally Signed
Package cat3k_caa-iosd-universalk9.SSA.150-9.12.EMD.pkg is Digitally Signed
Package cat3k_caa-platform.SSA.03.09.12.EMD.pkg is Digitally Signed
Package cat3k_caa-wcm.SSA.03.09.12.EMD.pkg is Digitally Signed
Preparing flash...
Syncing device...
Emergency Install successful... Rebooting
Restarting system.
```

```
Booting...(use DDR clock 667 MHz)Initializing and Testing RAM +++@@@#####...++@@+@@++@@+@@
```

### Related Topics

[Software Boot Modes](#), on page 3

[Installed Boot Mode](#), on page 3

[Bundle Boot Mode](#), on page 3

## Configuration Examples for Performing Switch Setup

### Example: Configuring a Switch as a DHCP Server

```
Switch# configure terminal
Switch(config)# ip dhcp pool pool1
Switch(dhcp-config)# network 10.10.10.0 255.255.255.0
Switch(dhcp-config)# boot config-boot.text
Switch(dhcp-config)# default-router 10.10.10.1
Switch(dhcp-config)# option 150 10.10.10.1
Switch(dhcp-config)# exit
Switch(config)# tftp-server flash:config-boot.text
Switch(config)# interface gigabitethernet1/0/4
Switch(config-if)# no switchport
Switch(config-if)# ip address 10.10.10.1 255.255.255.0
Switch(config-if)# end
```

### Related Topics

[Configuring DHCP Autoconfiguration \(Only Configuration File\)](#), on page 13

### Example: Configuring DHCP Auto-Image Update

### Related Topics

[Configuring DHCP Auto-Image Update \(Configuration File and Image\)](#), on page 15

## Example: Configuring a Switch to Download Configurations from a DHCP Server

This example uses a Layer 3 SVI interface on VLAN 99 to enable DHCP-based autoconfiguration with a saved configuration:

```
Switch# configure terminal
Switch(config)# boot host dhcp
Switch(config)# boot host retry timeout 300
Switch(config)# banner config-save ^C Caution - Saving Configuration File to NVRAM May Cause
  You to No longer Automatically Download Configuration Files at Reboot^C
Switch(config)# vlan 99
Switch(config-vlan)# interface vlan 99
Switch(config-if)# no shutdown
Switch(config-if)# end
Switch# show boot
BOOT path-list:
Config file:          flash:/config.text
Private Config file: flash:/private-config.text
Enable Break:        no
Manual Boot:          no
HELPER path-list:
NVRAM/Config file
  buffer size:       32768
Timeout for Config
  Download:          300 seconds
Config Download
  via DHCP:          enabled (next boot: enabled)
Switch#
```

### Related Topics

[Configuring the Client to Download Files from DHCP Server](#), on page 18

## Examples: Scheduling Software Image Reload

This example shows how to reload the software on the switch on the current day at 7:30 p.m:

```
Switch# reload at 19:30
Reload scheduled for 19:30:00 UTC Wed Jun 5 2013 (in 2 hours and 25 minutes)
Proceed with reload? [confirm]
```

This example shows how to reload the software on the switch at a future time:

```
Switch# reload at 02:00 jun 20
Reload scheduled for 02:00:00 UTC Thu Jun 20 2013 (in 344 hours and 53 minutes)
Proceed with reload? [confirm]
```



# Additional References For Performing Switch Setup

## Related Documents

| Related Topic                                  | Document Title  |
|--|---|
| Switch setup commands<br>Boot loader commands  | <i>System Management Command Reference (Catalyst 3650 Switches)</i>   |
| Pre-download feature                           | <i>System Management Configuration Guide (Cisco WLC 5700 Series)</i>  |
| IOS XE DHCP configuration                      | <i>IP Addressing Configuration Guide Library, Cisco IOS XE Release 3S (Catalyst 3650 Switches)</i>  |
| Hardware installation                          | <i>Catalyst 3650 Switch Hardware Installation Guide</i>   |
| Platform-independent command references        | <i>Configuration Fundamentals Command Reference, Cisco IOS XE Release 3S (Catalyst 3650 Switches)</i>   |
| Platform-independent configuration information | <i>Configuration Fundamentals Configuration Guide, Cisco IOS XE Release 3S (Catalyst 3650 Switches)</i><br><br><i>IP Addressing Configuration Guide Library, Cisco IOS XE Release 3S (Catalyst 3650 Switches)</i> |

## Standards and RFCs

| Standard/RFC | Title |
|--------------|-------|
| None         | —     |

## MIBs

| MIB                                  | MIBs Link  |
|--------------------------------------|--|
| All supported MIBs for this release. | To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:<br><br><a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a> |

**Technical Assistance**

| Description   | Link  |
|---|---|
| <p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p> | <a href="http://www.cisco.com/support">http://www.cisco.com/support</a> |

## Feature History and Information For Performing Switch Setup Configuration

| Command History | Release  | Modification                 |
|-----------------|--|------------------------------|
|                 | Cisco IOS XE 3.2SE Cisco IOS XE 3.3SE Cisco IOS XE 3.3SE | This feature was introduced. |