



Working with Configuration Files

This chapter describes how to work with switch configuration files on the Catalyst 6000 family switches.



Note

For complete syntax and usage information for the commands used in this chapter, refer to the *Catalyst 6000 Family Command Reference* publication.

This chapter consists of these sections:

- [Working with Configuration Files on the Switch, page 26-1](#)
- [Working with Configuration Files on the MSFC, page 26-9](#)

Working with Configuration Files on the Switch

These sections describe how to work with configuration files on the switch:

- [Creating and Using Configuration File Guidelines, page 26-1](#)
- [Creating a Configuration File, page 26-2](#)
- [Downloading Configuration Files to the Switch Using TFTP, page 26-3](#)
- [Uploading Configuration Files to a TFTP Server, page 26-5](#)
- [Copying Configuration Files Using rcp, page 26-6](#)
- [Downloading Configuration Files from an rcp Server, page 26-6](#)
- [Uploading Configuration Files to an rcp Server, page 26-7](#)
- [Clearing the Configuration, page 26-8](#)



Note

For more information on working with configuration files on the Flash file system, see [Chapter 24, “Working With the Flash File System.”](#)

Creating and Using Configuration File Guidelines

Creating configuration files can aid in the configuration of your switch. Configuration files can contain some or all the commands needed to configure one or more switches. For example, you might want to download the same configuration file to several switches that have the same hardware configuration so that they have identical module and port configurations.

Use the following guidelines when creating a configuration file:

- We recommend that you connect through the console port when using configuration files to configure the switch. If you configure the switch from a Telnet session, IP addresses are not changed, and ports and modules are not disabled.
- If no passwords have been set on the switch, you must set them on each switch by entering the **set password** and **set enablepass** commands. Enter a blank line after the **set password** and **set enablepass** commands. The passwords are saved in the configuration file as clear text.

If passwords already exist, you cannot enter the **set password** and **set enablepass** commands because the password verification will fail. If you enter passwords in the configuration file, the switch mistakenly attempts to execute the passwords as commands as it executes the file.

- Certain commands must be followed by a blank line in the configuration file. The blank line is necessary; without the blank line, these commands might disconnect your Telnet session. Before disconnecting a session, the switch prompts you for confirmation. The blank line acts as a carriage return, which indicates a negative response to the prompt and retains the Telnet session.

Include a blank line after each occurrence of these commands in a configuration file:

- **set interface sc0** *ip_addr netmask*
- **set interface sc0** **disable**
- **set module** **disable** *mod*
- **set port** **disable** *mod/port*

Creating a Configuration File

When creating a configuration file, you must list commands in a logical way so that the system can respond appropriately. One method of creating a configuration file is as follows:

-
- Step 1** Download an existing configuration from a switch.
 - Step 2** Open the configuration file in a text editor, such as vi or emacs on UNIX or Notepad on a PC.
 - Step 3** Extract the portion of the configuration file with the desired commands and save it in a new file. Make sure the file begins with the word **begin** on a line by itself and ends with the word **end** on a line by itself.
 - Step 4** Copy the configuration file to the appropriate TFTP directory on the workstation (usually /tftpboot on a UNIX workstation).
 - Step 5** Make sure the permissions on the file are set to world-read.
-

This example shows an example configuration file. This file could be used to set the Domain Name System (DNS) configuration on multiple switches.

```
begin
!
#dns
set ip dns server 172.16.10.70 primary
set ip dns server 172.16.10.140
set ip dns enable
set ip dns domain corp.com
end
```

Downloading Configuration Files to the Switch Using TFTP

You can configure the switch using configuration files you create or download from another switch. In addition, you can store configuration files on Flash devices on hardware that supports the Flash file system, and you can configure the switch using a configuration stored on a Flash device.

These sections describe how to configure the switch using configuration files downloaded from a TFTP server or stored on a Flash device:

- [Preparing to Download a Configuration File Using TFTP, page 26-3](#)
- [Configuring the Switch Using a File on a TFTP Server, page 26-3](#)
- [Configuring the Switch Using a File on a Flash Device, page 26-4](#)

Preparing to Download a Configuration File Using TFTP

Before you begin downloading a configuration file using TFTP, do the following:

- Ensure that the workstation acting as the TFTP server is configured properly. On a Sun workstation, make sure that the `/etc/inetd.conf` file contains this line:

```
tftp dgram udp wait root /usr/etc/in.tftpd in.tftpd -p -s /tftpboot
```

Make sure that the `/etc/services` file contains this line:

```
tftp 69/udp
```



Note You must restart the `inetd` daemon after modifying the `/etc/inetd.conf` and `/etc/services` files. To restart the daemon, either stop the `inetd` process and restart it, or enter a **fastboot** command (on the SunOS 4.x) or a **reboot** command (on Solaris 2.x or SunOS 5.x). Refer to the documentation for your workstation for more information about the TFTP daemon.

- Ensure that the switch has a route to the TFTP server. The switch and the TFTP server must be in the same subnetwork if you do not have a router to route traffic between subnets. Check connectivity to the TFTP server using the **ping** command.
- Ensure that the configuration file to be downloaded is in the correct directory on the TFTP server (usually `/tftpboot` on a UNIX workstation).
- Ensure that the permissions on the file are set as world-read.

Configuring the Switch Using a File on a TFTP Server

To configure the switch using a configuration file downloaded from a TFTP server, perform these steps:

-
- Step 1** Copy the configuration file to the appropriate TFTP directory on the workstation.
 - Step 2** Log into the switch through the console port or a Telnet session.
 - Step 3** Configure the switch using the configuration file downloaded from the TFTP server with the **copy tftp config** command. Specify the IP address or host name of the TFTP server and the name of the file to download.

The configuration file downloads, and the commands are executed as the file is parsed line-by-line.

This example shows how to configure the switch using a configuration file downloaded from a TFTP server:

```

Console> (enable) copy tftp config
IP address or name of remote host []? 172.20.52.3
Name of file to copy from []? dns-config.cfg

Configure using tftp:dns-config.cfg (y/n) [n]? y
/
Finished network download. (134 bytes)
>>
>> set ip dns server 172.16.10.70 primary
172.16.10.70 added to DNS server table as primary server.
>> set ip dns server 172.16.10.140
172.16.10.140 added to DNS server table as backup server.
>> set ip dns enable
DNS is enabled
>> set ip dns domain corp.com
Default DNS domain name set to corp.com
Console> (enable)

```

Configuring the Switch Using a File on a Flash Device

To configure a switch using a configuration file stored on a Flash device in the Flash file system, perform these steps:

-
- Step 1** Log into the switch through the console port or a Telnet session.
 - Step 2** Locate the configuration file using the **cd** and **dir** commands (for more information, see [Chapter 24, “Working With the Flash File System”](#)).
 - Step 3** Configure the switch using the configuration file stored on the Flash device using the **copy file-id config** command.

The commands are executed as the file is parsed line-by-line.

This example shows how to configure the switch using a configuration file stored on a Flash device:

```

Console> (enable) copy slot0:dns-config.cfg config

Configure using slot0:dns-config.cfg (y/n) [n]? y

Finished network download. (134 bytes)
>>
>> set ip dns server 172.16.10.70 primary
172.16.10.70 added to DNS server table as primary server.
>> set ip dns server 172.16.10.140
172.16.10.140 added to DNS server table as backup server.
>> set ip dns enable
DNS is enabled
>> set ip dns domain corp.com
Default DNS domain name set to corp.com
Console> (enable)

```

Uploading Configuration Files to a TFTP Server

These sections describe how to upload the running configuration or a configuration file stored on a Flash device to a TFTP server:

- [Preparing to Upload a Configuration File to a TFTP Server, page 26-5](#)
- [Uploading a Configuration File to a TFTP Server, page 26-5](#)

Preparing to Upload a Configuration File to a TFTP Server

Before you attempt to upload a configuration file to a TFTP server, do the following:

- Ensure that the workstation acting as the TFTP server is configured properly. On a Sun workstation, make sure that the `/etc/inetd.conf` file contains this line:

```
tftp dgram udp wait root /usr/etc/in.tftpd in.tftpd -p -s /tftpboot
```

Make sure that the `/etc/services` file contains this line:

```
tftp 69/udp
```



Note You must restart the `inetd` daemon after modifying the `/etc/inetd.conf` and `/etc/services` files. To restart the daemon, either stop the `inetd` process and restart it, or enter a **fastboot** command (on the SunOS 4.x) or a **reboot** command (on Solaris 2.x or SunOS 5.x). Refer to the documentation for your workstation for more information about the TFTP daemon.

- Ensure that the switch has a route to the TFTP server. The switch and the TFTP server must be in the same subnetwork if you do not have a router to route traffic between subnets. Check connectivity to the TFTP server using the **ping** command.
- You might need to create an empty file on the TFTP server before uploading the configuration file. To create an empty file, enter the **touch filename** command, where *filename* is the name of the file you will use when uploading the configuration to the server.
- If you are overwriting an existing file (including an empty file, if you had to create one), ensure that the permissions on the file are set as world-write.

Uploading a Configuration File to a TFTP Server

To upload a configuration file from a switch to a TFTP server for storage, perform these steps:

-
- Step 1** Log into the switch through the console port or a Telnet session.
- Step 2** Upload the switch configuration to the TFTP server with the **copy config tftp** command. Specify the IP address or host name of the TFTP server and the destination filename.

The file is uploaded to the TFTP server.

This example shows how to upload the running configuration to a TFTP server for storage:

```

Console> (enable) copy config tftp
IP address or name of remote host []? 172.20.52.3
Name of file to copy to []? cat6000_config.cfg

Upload configuration to tftp:cat6000_config.cfg, (y/n) [n]? y
.....
.....
.....

.....
.....
..
/
Configuration has been copied successfully.
Console> (enable)

```

Copying Configuration Files Using rcp

Remote copy protocol (rcp) provides another method of downloading, uploading, and copying configuration files between remote hosts and the switch. Unlike TFTP which uses User Datagram Protocol (UDP), a connectionless protocol, rcp uses Transmission Control Protocol (TCP), which is connection-oriented.

To use rcp to copy files, the server from or to which you will be copying files must support rcp. The rcp **copy** commands rely on the rsh server (or daemon) on the remote system. To copy files using rcp, you do not need to create a server for file distribution, as you do with TFTP. You need only to have access to a server that supports the remote shell (rsh). (Most UNIX systems support rsh.) Because you are copying a file from one place to another, you must have read permission on the source file and write permission on the destination file. If the destination file does not exist, rcp creates it for you.

Downloading Configuration Files from an rcp Server

These sections describe how to download a configuration file from an rcp server to the running configuration or to a Flash device:

- [Preparing to Download a Configuration File Using rcp, page 26-6](#)
- [Configuring the Switch Using a File on an rcp Server, page 26-7](#)

Preparing to Download a Configuration File Using rcp

Before you begin downloading a configuration file using rcp, do the following:

- Ensure that the workstation acting as the rcp server supports the remote shell (rsh).
- Ensure that the switch has a route to the rcp server. The switch and the server must be in the same subnetwork if you do not have a router to route traffic between subnets. Check connectivity to the rcp server using the **ping** command.

- If you are accessing the switch through the console or a Telnet session without a valid username, make sure that the current rcp username is the one you want to use for the rcp download. You can enter the **show users** command to view the current valid username. If you do not want to use the current username, create a new rcp username using the **set rcp username** command. The new username will be stored in NVRAM. If you are accessing the switch through a Telnet session with a valid username, this username will be used and there is no need to set the rcp username.

Configuring the Switch Using a File on an rcp Server

To configure a Catalyst 6000 family switch using a configuration file downloaded from an rcp server, perform these steps:

-
- Step 1** Copy the configuration file to the appropriate rcp directory on the workstation.
 - Step 2** Log into the switch through the console port or a Telnet session.
 - Step 3** Configure the switch using the configuration file downloaded from the rcp server using the **copy rcp config** command. Specify the IP address or host name of the rcp server and the name of the file to download.

The configuration file downloads and the commands are executed as the file is parsed line-by-line.

This example shows how to configure a Catalyst 6000 family switch using a configuration file downloaded from an rcp server:

```
Console> (enable) copy rcp config
IP address or name of remote host []? 172.20.52.3
Name of file to copy from []? dns-config.cfg

Configure using rcp:dns-config.cfg (y/n) [n]? y
/
Finished network download. (134 bytes)
>>
>> set ip dns server 172.16.10.70 primary
172.16.10.70 added to DNS server table as primary server.
>> set ip dns server 172.16.10.140
172.16.10.140 added to DNS server table as backup server.
>> set ip dns enable
DNS is enabled
>> set ip dns domain corp.com
Default DNS domain name set to corp.com
Console> (enable)
```

Uploading Configuration Files to an rcp Server

These sections describe how to upload the running configuration or a configuration file stored on a Flash device to an rcp server:

- [Preparing to Upload a Configuration File to an rcp Server, page 26-8](#)
- [Uploading a Configuration File to an rcp Server, page 26-8](#)

Preparing to Upload a Configuration File to an rcp Server

Before you attempt to upload a configuration file to an rcp server, do the following:

- Ensure that the workstation acting as the rcp server is configured properly.
- Ensure that the switch has a route to the rcp server. The switch and the rcp server must be in the same subnetwork if you do not have a router to route traffic between subnets. Check connectivity to the rcp server using the **ping** command.
- If you are overwriting an existing file (including an empty file, if you had to create one), ensure that the permissions on the file are set correctly. Permissions on the file should be user-write.

Uploading a Configuration File to an rcp Server

To upload a configuration file from a switch to an rcp server for storage, perform these steps:

-
- Step 1** Log into the switch through the console port or a Telnet session.
- Step 2** Upload the switch configuration to the rcp server using the **copy config rcp** command. Specify the IP address or host name of the rcp server and the destination filename.

The file is uploaded to the rcp server.

This example shows how to upload the running configuration on a Catalyst 6000 family switch to an rcp server for storage:

```

Console> (enable) copy config rcp
IP address or name of remote host []? 172.20.52.3
Name of file to copy to []? cat6000_config.cfg

Upload configuration to rcp:cat6000_config.cfg, (y/n) [n]? y
.....
.....
.....
.....
.....
.....
..
/
Configuration has been copied successfully.
Console> (enable)

```

Clearing the Configuration

To clear the configuration on the entire switch, perform this task in privileged mode:

Task	Command
Clear the switch configuration.	clear config all

This example shows how to clear the configuration for the entire switch:

```
Console> (enable) clear config all
This command will clear all configuration in NVRAM.
This command will cause ifIndex to be reassigned on the next system startup.
Do you want to continue (y/n) [n]? y
.....
.....

System configuration cleared.
Console> (enable)
```

To clear the configuration on an individual module, perform this task in privileged mode:

Task	Command
Clear the configuration for a specific module.	clear config mod



Note

If you remove a module and replace it with a module of another type (for example, if you remove a 10/100 Ethernet module and insert a Gigabit Ethernet module), the module configuration is inconsistent. The output of the **show module** command indicates this problem. To resolve the inconsistency, clear the configuration on the problem module.

This example shows how to clear the configuration on a specific module:

```
Console> (enable) clear config 2
This command will clear module 2 configuration.
Do you want to continue (y/n) [n]? y
.....
Module 2 configuration cleared.
Console> (enable)
```

Working with Configuration Files on the MSFC

These sections describe how to work with configuration files on the Multilayer Switch Feature Card (MSFC):

- [Uploading the Configuration File to a TFTP Server, page 26-10](#)
- [Uploading the Configuration File to the Supervisor Engine Flash PC Card, page 26-11](#)
- [Downloading the Configuration File from a Remote Host, page 26-11](#)
- [Downloading the Configuration File from the Supervisor Engine Flash PC Card, page 26-13](#)

Configuration information resides in two places when the MSFC is operating: the default (permanent) configuration in NVRAM and the running (temporary) memory in RAM. The default configuration always remains available; NVRAM retains the information even when the power is shut down. The current information is lost if the system power is shut down. The current configuration contains all nondefault configuration information that you added by using the **configure** command or the **setup** command facility, or by editing the configuration file.

The **copy running-config startup-config** command adds the current configuration to the default configuration in NVRAM, so that it is saved if power is shut down. Whenever you make changes to the system configuration, enter the **copy running-config startup-config** command to save the new configuration.

If you replace the MSFC, you need to replace the entire configuration. If you upload (copy) the configuration file to a remote server before removing the MSFC, you can retrieve it later and write it into NVRAM on the new MSFC. If you do not upload the configuration file, you need to use the **configure** command to reenter the configuration information after you install the new MSFC.

Saving and retrieving the configuration file is not necessary if you are temporarily removing an MSFC that you are going to reinstall; the lithium batteries retain the configuration in memory. This procedure requires privileged-level access to the EXEC command interpreter, which usually requires a password.

Uploading the Configuration File to a TFTP Server

Before you upload (copy) the running configuration to the TFTP file server, ensure the following:

- You have a connection to the MSFC either with a console terminal or remotely through a Telnet session.
- The MSFC is connected to a network supporting a file server (remote host).
- The remote host supports the TFTP application.
- You have the IP address or name of the remote host available.

To store information on a remote host, enter the privileged **write network** EXEC command. This command prompts you for the destination host address and a filename and then displays the instructions for confirmation. When you confirm the instructions, the MSFC sends a copy of the currently running configuration to the remote host. The system default is to store the configuration in a file called by the name of the MSFC with *-confg* appended. You can either accept the default filename by pressing **Return** at the prompt, or enter a different name before pressing **Return**.

To upload (copy) the currently running configuration to a remote host, perform these steps:

-
- Step 1** Check if the system prompt displays a pound sign (#) to indicate the privileged level of the EXEC command interpreter.
- Step 2** Enter the **ping** command to check the connection between the MSFC and the remote host.
- Step 3** Enter the **write term** command to display the currently running configuration on the terminal and ensure that the configuration information is complete and correct. If it is not correct, enter the **configure** command to add or modify the existing configuration.
- Step 4** Enter the **write net** command. The EXEC command interpreter prompts you for the name or IP address of the remote host that is to receive the configuration file. (The prompt might include the name or address of a default file server.)

```
Router# write net
Remote host []?
```

- Step 5** Enter the name or IP address of the remote host. In this example, the name of the remote server is *servername*:

```
Router# write net
Remote host []? servername
Translating "servername"...domain server (1.1.1.1) [OK]
```

- Step 6** Note that the EXEC command interpreter prompts you to specify a name for the file that is to hold the configuration. By default, the system appends *-confg* to the MSFC name to create the new filename. Press **Return** to accept the default filename, or enter a different name for the file before pressing **Return**. In the following example, the default is accepted:

```
Name of configuration file to write [Router-confg]?
```

```
Write file Router-config on host 1.1.1.1? [confirm]
Writing Router-config .....
```

- Step 7** Note that before the MSFC executes the copy process, it displays the instructions you entered for confirmation. If the instructions are not correct, enter **n** (no) and then **Return** to abort the process. To accept the instructions, press **Return** or **y** (yes) and then **Return**, and the system begins the copy process. In the following example, the default is accepted:

```
Write file Router-config on host 1.1.1.1? [confirm]
Writing Router-config: !!!! [ok]
```

While the MSFC copies the configuration to the remote host, it displays a series of exclamation points (!!!) or periods (...). The !!!! and [ok] indicate that the operation is successful. A display of ... [timed out] or [failed] indicates a failure, which would probably be due to a network fault or the lack of a writable, readable file on the remote file server.

- Step 8** Note that if the display indicates that the process was successful (with the series of !!!! and [ok]), the upload process is complete. The configuration is safely stored in the temporary file on the remote file server.

If the display indicates that the process failed (with the series of ... as shown in the following example):

```
Writing Router-config .....
```

your configuration was not saved. Repeat the preceding steps, or select a different remote file server and repeat the preceding steps.

If you are unable to copy the configuration to a remote host successfully, contact your network administrator or see the [“Obtaining Technical Assistance”](#) section on page xxxii for instructions on contacting the technical assistance center.

Uploading the Configuration File to the Supervisor Engine Flash PC Card

To upload the configuration file to the supervisor engine Flash PC card in PCMCIA slot 0, perform this task:

	Task	Command
Step 1	At the EXEC prompt, enter enable mode.	Router> enable
Step 2	Copy the startup configuration file to slot 0.	Router# copy startup-config sup-slot0:file_name
Step 3	Copy the running configuration file to slot 0.	Router# copy running-config sup-slot0:file_name

Downloading the Configuration File from a Remote Host

After you install the new MSFC, you can retrieve the saved configuration and copy it to NVRAM. Enter configuration mode and specify that you want to configure the MSFC from the network. The system prompts you for a host name and address, the name of the configuration file stored on the host, and confirmation to reboot using the remote file.

To download (retrieve) the currently running configuration from a remote host, perform these steps:

- Step 1** Check if the system prompt displays a pound sign (#) to indicate the privileged level of the EXEC command interpreter.



Note Until you retrieve the previous configuration, the MSFC runs from the default configuration in NVRAM. Any passwords that were configured on the previous system are not valid until you retrieve the configuration.

- Step 2** Enter the **ping** command to verify the connection between the router and the remote host.
- Step 3** At the system prompt, enter the **configure network** command and press **Return** to enter configuration mode. Specify that you want to configure the system from a network device (instead of from the console terminal, which is the default).

```
Router# configure network
```

- Step 4** Note that the system prompts you to select a host or network configuration file. The default is host; press **Return** to accept the default.

```
Host or network configuration file [host]?
```

- Step 5** Note that the system prompts you for the IP address of the host. Enter the IP address or name of the remote host (the remote file server to which you uploaded the configuration file).

```
IP address of remote host [255.255.255.255]? 1.1.1.1
```

- Step 6** Note that the system prompts you for the configuration filename. When uploading the file, the default is to use the name of the MSFC with the suffix *-confg* (*router-confg* in the following example). If you specified a different filename when you uploaded the configuration, enter the filename; otherwise, press **Return** to accept the default.

```
Name of configuration file [router-confg]?
```

- Step 7** Note that before the system reboots with the new configuration, it displays the instructions you entered for confirmation. If the instructions are not correct, enter **n** (no), and then press **Return** to cancel the process. To accept the instructions, press **Return**, or **y**, and then **Return**.

```
Configure using router-confg from 1.1.1.1? [confirm]
Booting router-confg from 1.1.1.1: ! ! [OK - 874/16000 bytes]
```

While the MSFC retrieves and boots from the configuration on the remote host, the console display indicates whether or not the operation was successful. A series of **!!!!** and **[OK]** (as shown in the preceding example) indicate that the operation was successful. A series of **. . .** and **[timed out]** or **[failed]** indicate a failure (which would probably be due to a network fault or an incorrect server name, address, or filename). The following is an example of a failed attempt to boot from a remote server:

```
Booting Router-confg . . . . . [timed out]
```

- Step 8** Proceed to the next step if the display indicates that the process was successful. If the display indicates that the process failed, verify the name or address of the remote server and the filename, and repeat the preceding steps. If you are unable to retrieve the configuration, contact your network administrator or see the [“Obtaining Technical Assistance”](#) section on page xxxii for instructions on contacting the technical assistance center.
- Step 9** Enter the **write term** command to display the currently running configuration on the terminal. Review the display and ensure that the configuration information is complete and correct. If it is not, verify the filename and repeat the preceding steps to retrieve the correct file, or use the **configure** command to add or modify the existing configuration. (See the appropriate software documentation for the configuration options available for the system, the individual interfaces, and specific configuration instructions.)

- Step 10** When you have verified that the currently running configuration is correct, enter the **copy running-config startup-config** command to save the retrieved configuration in NVRAM. Otherwise, you will lose the new configuration if you restart the system.
-

This completes the procedure for downloading (retrieving) the configuration file.

Downloading the Configuration File from the Supervisor Engine Flash PC Card

To download the configuration file from the supervisor engine Flash PC card in PCMCIA slot 0, perform this task:

	Task	Command
Step 1	At the EXEC prompt, enter enable mode.	Router> enable
Step 2	Copy the stored running configuration file to the MSFC running configuration.	Router# copy sup-slot0: <i>file_name</i> running-config
Step 3	Copy the stored startup configuration file to the MSFC running configuration.	Router# copy sup-slot0:<i>file_name</i> startup-config

