Cisco IOS Basic Skills

Understanding how to use Cisco IOS software saves time when you are configuring your router. If you need a refresher, take a few minutes to read this chapter. If you are already familiar with Cisco IOS software, go to Chapter 3, "Configuring Remote Office to Corporate Office Networks" or Chapter 4, "Configuring Small Office to ISP Networks."

This chapter describes what you need to know before you begin configuring your Cisco 805 router with Cisco IOS software (the software that runs your router).

Note   Cisco recommends that inexperienced network administrators use the Cisco 805 Fast Step software to configure their routers.

This chapter contains the following sections:

- Configuring the Router from a PC
- Understanding Command Modes
- Getting Help
- Enable Secret and Enable Passwords
- Entering Global Configuration Mode

- Using Commands
- Saving Configuration Changes

Configuring the Router from a PC

You can configure your router from a connected PC. For information on how to connect the PC, refer to the *Cisco 805 Router Hardware Installation Guide*.

After connecting the PC, you need *terminal emulation* software. The PC uses this software to send commands to your router. Table 2-1 lists some common types of this software, which are based on the type of PC you are using.

Table 2-1   Terminal Emulation Software

PC Operating System	Software
Windows 95, Windows 98, Windows NT	HyperTerm (included with Windows software), ProComm Plus
Windows 3.1	Terminal (included with Windows software)
Macintosh	ProComm, VersaTerm (supplied separately)

You can use the terminal emulation software to change settings for the type of device that is connected to the PC, in this case a router. Configure the software to the following standard VT-100 emulation settings so that your PC can communicate with your router:

- 9600 baud
- 8 data bits
- No parity
- 1 stop bit
- No flow control

These settings should match the default settings of your router. To change the router baud, data bits, parity, or stop bits settings, you must reconfigure parameters in the ROM monitor. For more information, refer to Appendix A, "ROM Monitor." To change the router flow control setting, use the **flowcontrol** line configuration command.

For information on how to enter global configuration mode so that you can configure you router, refer to the "Entering Global Configuration Mode" section later in this chapter.

Understanding Command Modes

This section describes the Cisco IOS command mode structure. Each command mode supports specific Cisco IOS commands. For example, you can use the **interface** *type number* command only from global configuration mode.

The following Cisco IOS command modes are hierarchical. When you begin a router session, you are in user EXEC mode.

- User EXEC
- Privileged EXEC
- Global configuration

Table 2-2 lists the command modes that are used in this guide, how to access each mode, the prompt you see in that mode, and how to exit to a mode or enter the next mode. Because each mode configures different router elements, you might need to enter and exit modes frequently. You can see a list of available commands for a particular mode by entering a question mark (?) at the prompt. For a description of each command, including syntax, refer to the Cisco IOS 12.0 documentation set.

Table 2-2   Command Modes Summary

Mode	Access Method	Prompt	Exit/Entrance Method	About this Mode
User EXEC	Begin a session with your router.	Router>	To exit router session, enter the **logout** command.	Use this mode to: • Change terminal settings. • Perform basic tests. • Display system information.
Privileged EXEC	Enter the **enable** command from user EXEC mode.	Router#	To exit to user EXEC mode, enter the **disable** command. To enter global configuration mode, enter the **configure** command.	Use this mode to: • Configure your router operating parameters. • Perform the verification steps shown in this guide. • To prevent unauthorized changes to your router configuration, access to this mode should be protected with a password as described in "Enable Secret and Enable Passwords" later in this chapter.

Table 2-2   Command Modes Summary (continued)

Mode	Access Method	Prompt	Exit/Entrance Method	About this Mode
Global configuration	Enter the **configure** command from privileged EXEC mode.	`Router (config)#`	To exit to privileged EXEC mode, enter the **exit** or **end** command, or press **Ctrl-Z**. To enter interface configuration mode, enter the **interface** command.	Use this mode to configure parameters that apply to your router as a whole. Also, you can access the following modes, which are described later in this table: • Interface configuration • Router configuration • Line configuration
Interface configuration	Enter the **interface** command (with a specific interface, such as **interface ethernet 0**) from global configuration mode.	`Router (config-if)#`	To exit to global configuration mode, enter the **exit** command. To exit to privileged EXEC mode, enter the **end** command, or press **Ctrl-Z**. To enter subinterface configuration mode, specify a subinterface with the **interface** command.	Use this mode to configure parameters for the router Ethernet and serial interfaces or subinterfaces.
Router configuration	Enter your router command followed by the appropriate keyword, for example **router rip**, from global configuration mode.	`Router (config-router)#`	To exit to global configuration mode, enter the **exit** command. To exit to privileged EXEC mode, enter the **end** command, or press **Ctrl-Z**.	Use this mode to configure an IP routing protocol.

Table 2-2   Command Modes Summary (continued)

Mode	Access Method	Prompt	Exit/Entrance Method	About this Mode
Line configuration	Specify the **line** command with the desired keyword, for example, **line 0**, from global configuration mode.	`Router (config-line)#`	To exit to global configuration mode, enter the **exit** command. To enter privileged EXEC mode, enter the **end** command, or press **Ctrl-Z**.	Use this mode to configure parameters for the terminal line.

Getting Help

You can use the question mark (?) and arrow keys to help you enter commands.

For a list of available commands at that command mode, enter a question mark:

```
router> ?
access-enable   Create a temporary access-list entry
access-profile  Apply user-profile to interface
clear           Reset functions
...
```

To complete a command, enter a few known characters followed by a question mark (with no space):

```
router> s?
* s=show set show slip systat
```

For a list of command variables, enter the command followed by a space and a question mark:

```
router> show ?
clock       Display the system clock
dialer      Dialer parameters and statistics
exception   exception information
...
```

To redisplay a command you previously entered, press the up-arrow key. You can continue to press the up arrow key for more commands.

Enable Secret and Enable Passwords

By default, the router ships without password protection. Because many privileged EXEC commands are used to set operating parameters, you should password-protect these commands to prevent unauthorized use.

You can use two commands to do this:

- **enable secret** <*password*> (a very secure, encrypted password)
- **enable** <*password*> (a less secure, unencrypted password)

You must enter an **enable secret** password to gain access to privileged EXEC mode commands.

For maximum security, the passwords should be different. If you enter the same password for both during the setup process, your router accepts the passwords, but warns you that they should be different.

An **enable secret** password can contain from 1 to 25 uppercase and lowercase alphanumeric characters. An **enable** password can contain any number of uppercase and lowercase alphanumeric characters. In both cases, a number cannot be the first character. Spaces are also valid password characters; for example, *two words* is a valid password. Leading spaces are ignored; trailing spaces are recognized.

If you lose or forget your enable password, refer to Appendix E, "Recovering a Lost Enable Password."

Entering Global Configuration Mode

To make any configuration changes to your router, you must be in global configuration mode. This section describes how to enter global configuration mode while using a terminal or PC that is connected to your router Console port.

To enter global configuration mode:

Step 1   After your router boots up, answer **no** when the following question displays:

```
Would you like to enter the initial configuration dialog [yes]: no
```

Step 2   Enter the **enable** command:

```
router> enable
```

Step 3   If you have configured your router with an enable password, enter it when you are prompted.

The enable password does not show on the screen when you enter it. This example shows how to enter privileged EXEC mode:

```
Password: <enable_password>
router#
```

Enable mode is indicated by the # in the prompt. You can now make changes to your router configuration.

Step 4   Enter the **configure terminal** command to enter global configuration mode, indicated by (config)# in the prompt:

```
router# configure terminal
router (config)#
```

You can now make changes to your router configuration.

Using Commands

This section provides some tips about entering Cisco IOS commands at the command-line interface (CLI).

Abbreviating Commands

You only have to enter enough characters for the router to recognize the command as unique. This example shows how to enter the **show version** command:

```
router # sh v
```

Undoing Commands

If you want to disable a feature or undo a command you entered, you can enter the keyword **no** before most commands; for example, **no ip routing**.

Command-Line Error Messages

Table 2-3 lists some error messages that you might encounter while using the CLI to configure your router.

Table 2-3 Common CLI Error Messages

Error Message	Meaning	How to Get Help
`% Ambiguous command:` `"show con"`	You did not enter enough characters for your router to recognize the command.	Reenter the command followed by a question mark (?) with no space between the command and the question mark. The possible keywords that you can enter with the command are displayed.
`% Incomplete command.`	You did not enter all of the keywords or values required by this command.	Reenter the command followed by a question mark (?) with no space between the command and the question mark. The possible keywords that you can enter with the command are displayed.
`% Invalid input detected at` `'^' marker.`	You entered the command incorrectly. The error occurred where the caret mark (^) appears.	Enter a question mark (?) to display all of the commands that are available in this command mode.

Saving Configuration Changes

You need to enter the **copy running-config startup-config** command to save your configuration changes to nonvolatile RAM (NVRAM) so that they are not lost if there is a system reload or power outage. This example shows how to use this command to save your changes:

```
router # copy running-config startup-config
Destination filename [startup-config]?
```

Press the Return key to accept the default destination filename startup-config, or enter your desired destination filename and press the Return key.

It might take a minute or two to save the configuration to NVRAM. After the configuration has been saved, the following message appears:

```
Building configuration...
router #
```

Summary

Now that you have reviewed some Cisco IOS software basics, you can begin to configure your router. Remember:

- You can use the question mark (?) and arrow keys to help you enter commands.

- Each command mode restricts you to a set of commands. If you are having difficulty entering a command, check the prompt, and then enter the question mark (?) for a list of available commands. You might be in the wrong command mode or using the wrong syntax.

- If you want to disable a feature, enter the keyword **no** before the command; for example, **no ip routing**.

- Save your configuration changes to NVRAM so that they are not lost if there is a system reload or power outage.

Where to Go Next

To begin configuring your router, go to either Chapter 3, "Configuring Remote Office to Corporate Office Networks" or Chapter 4, "Configuring Small Office to ISP Networks."