

Using the Command Line Interface

Cisco IOS commands can be entered at a terminal connected to the access server or router using the command line interface (CLI). Commands may also be entered using the Cisco Web browser interface. This chapter describes how to use the Cisco IOS command line interface and Web page interface. It describes command modes, help features, command editing and history features, and menus.

For a complete description of the user interface commands in this chapter, refer to the “Basic Command Line Interface Commands” chapter of the *Configuration Fundamentals Command Reference*. To locate documentation of specific commands, use the command reference index or search online.

User Interface Task List

You can perform the tasks in the following sections to familiarize yourself with the Cisco IOS user interface. If you are not familiar with the Cisco IOS command line interface, read the first six sections to gain a basic understanding of the user interface.

- Access Each Command Mode
- Using the No and Default Forms of Commands
- Get Context-Sensitive Help
- Check Command Syntax
- Use the Command History Features
- Use the Editing Features
- Create Menus
- Use the Cisco Web Browser Interface to Issue Commands
- Customize the User Interface on a Web Browser
- Display 8-bit and Multibyte Character Sets

Access Each Command Mode

The Cisco IOS user interface is divided into many different modes. The commands available to you at any given time depend on which mode you are currently in. Entering a question mark (?) at the system prompt allows you to obtain a list of commands available for each command mode.

When you start a session on the router, you begin in user mode, often called EXEC mode. Only a limited subset of the commands are available in EXEC mode. In order to have access to all commands, you must enter privileged EXEC mode. Normally, you must enter a password to enter privileged EXEC mode. From privileged mode, you can enter any EXEC command or enter global configuration mode. Most of the EXEC commands are one-time commands, such as **show** commands, which show the current status of something, and **clear** commands, which clear counters or interfaces. The EXEC commands are not saved across reboots of the router.

The configuration modes allow you to make changes to the running configuration. If you later save the configuration, these commands are stored across router reboots. In order to get to the various configuration modes, you must start at global configuration mode. From global configuration mode, you can enter interface configuration mode, subinterface configuration mode, and a variety of protocol-specific modes.

ROM monitor mode is a separate mode used when the router cannot boot properly. If your router or access server does not find a valid system image when it is booting, or if its configuration file is corrupted at startup, the system might enter read-only memory (ROM) monitor mode.

The following sections describe how to access each of the Cisco IOS command modes:

- User EXEC Mode
- Privileged EXEC Mode
- Global Configuration Mode
- Interface Configuration Mode
- Subinterface Configuration Mode
- ROM Monitor Mode

User EXEC Mode

After you log in to the router or access server, you are automatically in user EXEC command mode. The EXEC commands available at the user level are a subset of those available at the privileged level. In general, the user EXEC commands allow you to connect to remote devices, change terminal settings on a temporary basis, perform basic tests, and list system information.

To list the user EXEC commands, complete the following task:

Task	Command
List the user EXEC commands.	?

The user-level prompt consists of the host name followed by the angle bracket (>):

```
Router>
```

The default host name is `Router` unless it has been changed during initial configuration using the **setup** command. Refer to the product user guide for information on the **setup** facility. You can also change the host name using the **hostname** global configuration command described in the “Basic System Management Commands” chapter in the *Configuration Fundamentals Command Reference*.

To list the commands available in user EXEC mode, enter a question mark (?) as shown in the following example:

```
Router> ?
Exec commands:
 <1-99>          Session number to resume
 connect        Open a terminal connection
```

disconnect	Disconnect an existing telnet session
enable	Turn on privileged commands
exit	Exit from the EXEC
help	Description of the interactive help system
lat	Open a lat connection
lock	Lock the terminal
login	Log in as a particular user
logout	Exit from the EXEC
menu	Start a menu-based user interface
mbranch	Trace multicast route for branch of tree
mrbranch	Trace reverse multicast route to branch of tree
mtrace	Trace multicast route to group
name-connection	Name an existing telnet connection
pad	Open a X.29 PAD connection
ping	Send echo messages
resume	Resume an active telnet connection
show	Show running system information
systat	Display information about terminal lines
telnet	Open a telnet connection
terminal	Set terminal line parameters
tn3270	Open a tn3270 connection
trace	Trace route to destination
where	List active telnet connections
x3	Set X.3 parameters on PAD
xremote	Enter XRemote mode

The list of commands might vary slightly from this example, depending on the software feature set and configuration of your Cisco routing product.

Privileged EXEC Mode

Because many of the privileged commands set operating parameters, privileged access should be password protected to prevent unauthorized use. The privileged command set includes those commands contained in user EXEC mode, as well as the **configure** command through which you can access the remaining command modes. Privileged EXEC mode also includes high-level testing commands, such as **debug**. For details on the **debug** commands, see the *Debug Command Reference*.

The privileged EXEC mode prompt consists of the device's host name followed by the pound sign (#). (If the router or access server was named with the **hostname** command, that name would appear as the prompt instead of "Router.")

```
Router#
```

To access and list the privileged EXEC commands, complete the following tasks:

Task	Command
Step 1 Enter the privileged EXEC mode.	enable [password]
Step 2 List privileged EXEC commands.	?

To return from privileged EXEC mode to user EXEC mode, perform the following task:

Task	Command
Move from privileged EXEC mode to user EXEC mode.	disable

If the system administrator has set a password, you are prompted to enter it before being allowed access to privileged EXEC mode. The password is not displayed on the screen and is case sensitive. If an enable password has not been set, enable mode can be accessed only from the router console. The system administrator uses the **enable password** global configuration command to set the password that restricts access to privileged mode. This command is described in the “Passwords and Privileges Commands” chapter in the *Security Command Reference*.

The following example shows how to access privileged EXEC mode:

```
Router> enable
Password:
Router#
```

From the privileged level, you can access global configuration mode. For instructions, see the “Global Configuration Mode” section, which follows this section.

Global Configuration Mode

Global configuration commands apply to features that affect the system as a whole, rather than just one protocol or interface. Use the **configure terminal** privileged EXEC command to enter global configuration mode.

Commands to enable a particular routing or bridging function are also global configuration commands. For information on protocol-specific global configuration commands, see the appropriate configuration guide in the Cisco IOS software documentation.

To access and list the global configuration commands, complete the following tasks:

Task	Command
Step 1 At the terminal, from the privileged EXEC mode, enter global configuration mode.	configure terminal
Step 2 List the global configuration commands.	?

The following example shows how to access global configuration mode:

```
Router# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
```

To exit global configuration command mode and return to privileged EXEC mode, use one of the following commands:

Task	Command
Exit global configuration mode.	exit end Ctrl-Z

From global configuration mode, you can access a number of other command modes. These command modes are described in the sections that follow. For a complete list of these modes, see the section “Other Configuration Modes.”

Interface Configuration Mode

Many features are enabled on a per-interface basis. Interface configuration commands modify the operation of an interface such as an Ethernet, FDDI, or serial port. Interface configuration commands always follow an **interface** global configuration command, which defines the interface type.

For details on interface configuration commands that affect general interface parameters, such as bandwidth, clock rate, and so on, see the “Interface Commands” chapter in the *Configuration Fundamentals Command Reference*. For protocol-specific commands, see the appropriate Cisco IOS software command reference.

To access and list the interface configuration commands, complete the following tasks:

Task	Command
Step 1 From global configuration mode, enter interface configuration mode.	interface <i>type number</i>
Step 2 List the interface configuration commands.	?

In the following example, serial interface 0 is about to be configured. The new prompt Router(config-if)# indicates interface configuration mode.

```
Router(config)# interface serial 0 <CR>
Router(config-if)#
```

To exit interface configuration mode and return to global configuration mode, enter the **exit** command. To exit configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.

Subinterface Configuration Mode

You can configure multiple virtual interfaces (called subinterfaces) on a single physical interface. Subinterfaces appear to be distinct physical interfaces to the various protocols. For example, Frame Relay networks provide multiple point-to-point links called permanent virtual circuits (PVCs). PVCs can be grouped under separate subinterfaces that in turn are configured on a single physical interface. From a bridging spanning-tree viewpoint, each subinterface is a separate bridge port, and a frame arriving on one subinterface can be sent out on another subinterface.

Subinterfaces also allow multiple encapsulations for a protocol on a single interface. For example, a router or access server can receive an ARPA-framed IPX packet and forward the packet back out the same physical interface as a SNAP-framed IPX packet.

For detailed information on how to configure subinterfaces, see the appropriate module for a specific protocol in the Cisco IOS software documentation.

To access and list the subinterface configuration commands, complete the following tasks:

Task	Command
Step 1 From interface configuration mode, configure a virtual interface.	See the example that follows. For information on interface commands that allow subinterface implementation, see the protocol specific chapter later in this publication.
Step 2 List the subinterface configuration commands.	?

In the following example, a subinterface is configured for serial line 2, which is configured for Frame Relay encapsulation. The subinterface is called 2.1 to indicate that it is subinterface 1 of serial interface 2. The new prompt `Router(config-subif)#` indicates that you are in subinterface configuration mode. The subinterface can be configured to support one or more Frame Relay PVCs.

```
Router(config)# interface serial 2
Router(config-if)# encapsulation frame-relay
Router(config-if)# interface serial 2.1
Router(config-subif)#
```

To exit subinterface configuration mode and return to global configuration mode, enter the **exit** command. To exit configuration mode and return to privileged EXEC mode, press **Ctrl-Z**.

ROM Monitor Mode

If your router or access server does not find a valid system image, or if you interrupt the boot sequence, the system might enter read-only memory (ROM) monitor mode. From ROM monitor mode, you can boot the device or perform diagnostic tests.

You can also enter ROM monitor mode by entering the **reload** EXEC command and then pressing the Break key during the first 60 seconds of startup. If you have changed the configuration, use the **copy running-config startup-config** command and then issue the **reload** command to save your configuration changes.

To access and list the ROM monitor configuration commands, complete the following tasks:

Task	Command
Enter ROM monitor mode from privileged EXEC mode.	reload Press the Break key during the first 60 seconds while the system is booting.
List the ROM monitor commands.	?

The ROM monitor prompt is the angle bracket (>):

```
> ?
$ state      Toggle cache state (? for help)
B [filename] [TFTP Server IP address | TFTP Server Name]
              Load and execute system image from ROM or from TFTP server
C [address]  Continue execution [optional address]
D /S M L V   Deposit value V of size S into location L with modifier M
E /S M L     Examine location L with size S with modifier M
G [address]  Begin execution
H            Help for commands
I            Initialize
K            Stack trace
L [filename] [TFTP Server IP address | TFTP Server Name]
              Load system image from ROM or from TFTP server, but do not
              begin execution
O            Show configuration register option settings
P            Set the break point
S            Single step next instruction
T function   Test device (? for help)
Deposit and Examine sizes may be B (byte), L (long) or S (short).
Modifiers may be R (register) or S (byte swap).
Register names are: D0-D7, A0-A6, SS, US, SR, and PC
```

To return to user EXEC mode, type **continue**. To initialize the router or access server, enter the **i** command. The **i** command causes the bootstrap program to reinitialize the hardware, clear the contents of memory, and boot the system. (It is best to issue the **i** command before you run any tests

or boot software.) To boot the system image file, use the **b** command (see the “Rebooting a Router” chapter). For details on ROM monitor mode commands, refer to the appropriate hardware installation guide.

Summary of Main Command Modes

Table 1 summarizes the main command modes of the Cisco IOS software.

Table 1 Summary of Main Command Modes

Command Mode	Access Method	Prompt	Exit Method
User EXEC	Log in.	Router>	Use the logout command.
Privileged EXEC	From user EXEC mode, use the enable EXEC command.	Router#	To exit back to user EXEC mode, use the disable command. To enter global configuration mode, use the configure terminal privileged EXEC command.
Global configuration	From privileged EXEC mode, use the configure terminal privileged EXEC command.	Router (config) #	To exit to privileged EXEC mode, use the exit or end command or press Ctrl-Z . To enter interface configuration mode, enter an interface configuration command.
Interface configuration	From global configuration mode, enter by specifying an interface with an interface command.	Router (config-if) #	To exit to global configuration mode, use the exit command. To exit to privileged EXEC mode, use the exit command or press Ctrl-Z . To enter subinterface configuration mode, specify a subinterface with the interface command.
Subinterface configuration	From interface configuration mode, specify a subinterface with an interface command.	Router (config-subif) #	To exit to global configuration mode, use the exit command. To enter privileged EXEC mode, use the end command or press Ctrl-Z .
ROM monitor	From privileged EXEC mode, use the reload EXEC command. Press the Break key during the first 60 seconds while the system is booting.	>	To exit to user EXEC mode, type continue .

Other Configuration Modes

The following sections describe the other configuration modes:

- Access-List Configuration Mode
- APPN Command Modes
- Controller Configuration Mode
- Crypto Map Configuration Mode
- Hex Input Mode
- Hub Configuration Mode

- IBM Channel Attach Command Modes
- IPX-Router Configuration Mode
- Key Chain Configuration Mode
- LANE Database Configuration Mode
- Line Configuration Mode
- Map-Class Configuration Mode
- Map-List Configuration Mode
- Response Time Reporter Configuration Mode
- Route-Map Configuration Mode
- Router Configuration Mode
- TN3270 Server Command Modes

Most of these modes can be entered from global configuration mode. In these modes, the **exit** command returns you to the global configuration mode. Other modes must be entered from another configuration mode. Entering the **exit** command in one of these modes returns you to the configuration mode you used to enter the mode.

In any configuration mode, to enter privileged EXEC mode and leave configuration mode entirely, use the **end** command or press **Ctrl-Z**.

Table 2 in the “Summary of Configuration Command Modes” section lists how to enter each mode.

Access-List Configuration Mode

All IP and IPX access lists can be identified by a number. Alternatively, some IP and IPX access lists can be identified by a name. Use access-list configuration mode when you are creating a named IP or IPX access list.

For information on creating a named IP access list, refer to the “Configuring IP Services” chapter in the *Network Protocols Configuration Guide, Part 1*. For information on creating a named IPX access list, refer to the “Configuring Novell IPX” chapter in the *Network Protocols Configuration Guide, Part 2*.

APPN Command Modes

Advanced Peer-to-Peer Networking (APPN) is the second generation of SNA. APPN provides support for client/server applications and offers more dynamics than traditional hierarchical SNA, such as dynamic directory and routing services.

APPN allows you to define attributes of the APPN network that can become quite complex. To easily manage the details of APPN, special configuration command modes and conventions have been developed.

Because APPN offers a large number of configuration options, specific configuration dialogs are used for each major APPN configuration item. When you define the major item, you will automatically enter the detailed configuration mode for that item. There are two options to exit the detailed configuration mode. Use the **complete** command to exit the detailed configuration mode and update the APPN subsystem with the changes. Use the **exit** command to leave the definition in “no complete” state without updating the APPN subsystem.

Refer to the “APPN Configuration Commands” chapter in the *Bridging and IBM Networking Command Reference* for information on the following APPN modes:

- APPN Control Point Mode
- APPN Port Mode
- APPN Link Station Mode
- APPN Connection Network Mode
- APPN Class of Service Mode
- APPN Mode Configuration Mode
- APPN Partner LU Location Mode
- APPN Subsystem Mode

Controller Configuration Mode

You can configure channelized T1 in the controller configuration mode. Refer to the “Configuring Channelized E1 and Channelized T1” chapter in the *Dial Solutions Configuration Guide* for more information.

Crypto Map Configuration Mode

Use crypto map configuration mode to create or alter the definition of a crypto-map. Crypto-maps are part of an authentication/encryption router configuration. For more information, refer to the “Network Data Encryption Commands” chapter in the *Security Command Reference*.

Hex Input Mode

Use hex input mode to enter a public key for an encrypting peer router. The public key data is entered in hexadecimal form, and it will take more than one command line to enter. To continue entering the public key data on a new line, press Return. When the public key is completely entered, press Return to get a new line, then type **quit** to return to the global configuration mode. For more information, refer to the “Network Data Encryption Commands” chapter in the *Security Command Reference*.

Hub Configuration Mode

Hub configuration commands configure hub functionality for an Ethernet interface on the Cisco 2500. They always follow a **hub** global configuration command. Refer to the “Configuring LAN Interfaces” chapter in this publication and the “Interface Commands” chapter in the *Configuration Fundamentals Command Reference*.

IBM Channel Attach Command Modes

The Channel Interface Processor (CIP) supports the IBM channel attach feature. This configuration is an ideal connectivity hub for large corporate networks that provide routing services between mainframes and LANs.

Interface Channel Configuration Mode

Before you configure your channel attach interface, you must select an interface. The following mode is valid only for port 2 on a CIP board. Ports 0 and 1 represent real, physical ports. Port 2 is an internal, virtual port. Refer to the “IBM Channel Attach Commands” chapter in the *Bridging and IBM Networking Command Reference*.

Internal LAN Configuration Mode

Use the IBM channel internal LAN configuration mode to configure an internal LAN on a CIP interface and configure Cisco Systems Network Architecture (CSNA) parameters. Refer to the “IBM Channel Attach Commands” chapter in the *Bridging and IBM Networking Command Reference*.

Internal Adapter Configuration Mode

Internal adapter commands allow you to configure the link characteristics for the internal LAN adapter and name the internal LAN adapter. Refer to the “IBM Channel Attach Commands” chapter in the *Bridging and IBM Networking Command Reference*.

To configure an internal adapter interface, you must first use the bridge-group internal LAN configuration command or the source-bridge internal LAN configuration command to configure bridging type. These commands are documented in the “Source-Route Bridging Commands” chapter of the *Bridging and IBM Networking Command Reference*.

IPX-Router Configuration Mode

Internet Packet Exchange (IPX) is a Novell network-layer protocol. The IPX-router configuration mode is used to configure IPX routing. Refer to the “Novell IPX Commands” chapter in the *Network Protocols Command Reference, Part 2*.

Key Chain Configuration Mode

From key chain configuration mode, you can manage authentication keys. For details on how to use key chain configuration commands, consult the “Configuring IP Routing Protocol-Independent Features” chapter of the *Network Protocols Configuration Guide, Part 1*.

Key management controls the authentication keys that routing protocols use. To enter key chain configuration mode, identify or define a key chain using the **keychain** command. From key chain configuration mode, you can identify or define key numbers.

Key Chain Key Configuration Mode

Once you define a key chain, use the key chain key configuration mode to configure the keys on the key chain. Refer to the “IP Routing Protocol-Independent Commands” chapter in the *Network Protocols Command Reference, Part 1*.

LANE Database Configuration Mode

LAN emulation (LANE) clients consult the LANE configuration server for information such as the location of the LANE server. The configuration server looks up the configuration information in its name database.

A LANE database contains entries that bind an emulated LAN name to the ATM address of the LANE server, bind LANE client MAC addresses to an emulated LAN name, and bind LANE client ATM address templates to an emulated LAN name.

In LANE database configuration mode, you can use the **client-atm-address name**, **default name**, **mac-address name**, and **name server-atm-address** commands to create entries in the specified database.

Refer to the “LAN Emulation Commands” chapter of the *Cisco IOS Switching Services Command Reference*.

Line Configuration Mode

Line configuration commands modify the operation of an auxiliary, console, physical, or virtual terminal line. Line configuration commands always follow a **line** command, which defines a line number. These commands are generally used to connect to remote routers or access servers, change terminal parameter settings either on a line-by-line basis or for a range of line, and set up the auxiliary port modem configuration to support dial-on-demand routing (DDR). See the “Configuring Modem Support and Asynchronous Devices” chapter in the *Dial Solutions Configuration Guide*.

Map-Class Configuration Mode

Cisco IOS software allows you to specify parameters that control the traffic that the source router will send over a switched virtual circuit (SVC). See the “Configuring ATM on the AIP for Cisco 7000 and 7500 Series Routers” and “Configuring ATM on the NPM for Cisco 4500 and 4700 Routers” chapters in the *Wide-Area Networking Configuration Guide*.

Map-List Configuration Mode

Cisco IOS ATM and Frame Relay software supports static mapping schemes that identify the protocol addresses of remote hosts or routers. For a listing of which Cisco platforms support ATM and Frame Relay, see the “Platform Support” appendix in the *Configuration Fundamentals Command Reference*.

Map-list configuration commands configure a map list. They always follow a **map-list** global configuration command. See the “ATM Commands” chapter in the *Wide-Area Networking Command Reference*.

Response Time Reporter Configuration Mode

Use the response time reporter configuration mode to configure a probe to measure response times and availability. Refer to the “Monitoring the Router and Network” chapter in the *Configuration Fundamentals Configuration Guide*.

Route-Map Configuration Mode

Use the route-map configuration mode to configure routing table and source and destination information. See the “Configuring IP Routing Protocol-Independent Features” chapter in the *Network Protocols Configuration Guide, Part 1*.

Router Configuration Mode

Router configuration commands configure an IP routing protocol and always follow a **router** command. See the relevant chapter on your IP routing protocol in the *Network Protocols Configuration Guide, Part 1*.

TN3270 Server Command Modes

The TN3270 server provides a set of command modes. The TN3270 server can be configured only on Port 2, the internal LAN port, of a Channel Interface Processor (CIP) card.

Note These commands are documented in the “Configuring IBM Channel Attach” chapter in the *Bridging and IBM Networking Configuration Guide* and the “IBM Channel Attach Commands” chapter in the *Bridging and IBM Networking Command Reference*.

The following are the TN3270 server command modes:

- TN3270 server configuration mode
- DLUR configuration mode
- DLUR SAP configuration mode
- PU configuration mode

Summary of Configuration Command Modes

Table 2 lists the command modes, how to access and exit each mode, the prompt while in each mode, and an example of how to get to the mode. The exit method is only listed if the **exit** command does not return you to global configuration mode or you must use a different command to exit the mode. The prompts listed assume that the default device name is “Router.”

Table 2 Summary of Command Modes

Command Mode	Access and Exit Method	Prompt	Example
Access-list configuration	From global configuration mode, use the ip access-list or ipx access-list command. ip access-list {standard extended} name or ipx access-list {standard extended sap summary} name	Router (config-std-nacl) # or Router (config-ext-nacl) #	Router (config) # ip access-list extended flag Router (config-ext-nacl) #
APPN configuration	From global configuration mode, use the appn mode command.	Router (appn) #	Router (config) # appn mode Router (appn) #
Controller configuration	From global configuration mode, use the controller t1 slot/port command to configure a channelized T1 interface.	Router (config-controller) #	Router (config) # controller t1 0/0 Router (config-controller) #

Table 2 Summary of Command Modes (Continued)

Command Mode	Access and Exit Method	Prompt	Example
Crypto map configuration	From global configuration mode, use the crypto map <i>map-name</i> [<i>seq-num</i>] command.	Router (config-crypto-map) #	Router (config) # crypto map Research 10 Router (config-crypto-map) #
Hex input	From global configuration mode, use the crypto public-key command. crypto public-key <i>key-name serial-number</i> To exit hex input mode, use the quit command.	Router (config-pubkey) #	Router (config) # crypto public-key BananaCryptoEngine 01709644 Enter a public key as a hexadecimal number Router (config-pubkey) # C31260F4 BD8A5ACE 2C1B1E6C 8B0ABD27 01493A50 Router (config-pubkey) # A6A66946 Router (config-pubkey) # quit Router (config) #
Hub configuration	From global configuration mode, enter by specifying a hub with the hub <i>number port</i> [<i>port</i>] command.	Router (config-hub) #	Router (config) # hub ethernet 0 1 3 Router (config-hub) #
Interface channel configuration	From global configuration mode, use the interface channel <i>slot/port</i> command.	Router (config) #	Router (config) # interface channel 0/1 Router (config) #
Internal LAN configuration	From interface configuration mode, use the lan [ethernet tokenring fdi] <i>lan-id</i> command. To exit to interface configuration mode, use the exit command.	Router (config-if) #	Router (config) # lan ethernet 10 Router (cfg-lan-Ether 10) #
Internal adapter configuration	From internal LAN configuration mode, enter the adapter <i>adapter-number mac-address</i> command. To exit to Internal LAN configuration mode, use the exit command.	Router (config-lan) #	Router (config) # lan ethernet 10 Router (cfg-lan-Ether 10) # adapter 1 4.5.6 Router (cfg-adap-Ether 10-1) #
IPX-router configuration	From global configuration mode, enter by issuing the ipx routing command, then a command that begins with ipx router (such as ipx router eigrp). ipx router { eigrp <i>autonomous-system-number</i> nlsp [<i>tag</i>] rip }	Router (config-ipx-router) #	Router (config) # ipx router rip Router (config-ipx-router) #
Key chain configuration	From global configuration mode, use the keychain command. keychain <i>name-of-chain</i>	Router (config-keychain) #	Router (config) # keychain blue Router (config-keychain) #
Key chain key configuration	From key chain configuration mode, use the key <i>number</i> command. To exit to key chain configuration mode, use the exit command.	Router (config-keychain-key) #	Router (config) # keychain blue Router (config-keychain) # key 10 Router (config-keychain-key) #

Access Each Command Mode

Table 2 Summary of Command Modes (Continued)

Command Mode	Access and Exit Method	Prompt	Example
LANE database configuration	From global configuration mode, use the lane database command. lane database <i>[database-name]</i>	Router (lane-config-datab) #	Router (config) # lane database red Router (lane-config-datab) #
Line configuration	From global configuration mode, enter by specifying a line with a line {aux con tty vty} line-number [ending-line-number] command.	Router (config-line) #	Router (config) # line vty 0 4 Router (config-line) #
Map-class configuration	From global configuration mode, configure a map class with the map-class encapsulation class-name command.	Router (config-map-class) #	Router (config) # map-class atm aaa Router (config-map-class) #
Map-list configuration	From global configuration mode, define a map list with the map-list name command.	Router (config-map-list) #	Router (config) # map-list atm Router (config-map-list) #
Response time reporter configuration	From global configuration mode, use the rtr command. rtr probe	Router (config-rtr) #	Router (config) # rtr 1 Router (config-rtr) #
Route-map configuration	From global configuration mode, enter by specifying the route-map [map-tag] command.	Router (config-route-map) #	Router (config) # route-map arizona Router (config-route-map) #
Router configuration	From global configuration mode, enter by issuing the router [keyword] command (such as router igrp).	Router (config-router) #	Router (config) # router rip Router (config-router) #
TN3270 server configuration	From interface configuration mode, use the tn3270-server command. To exit to interface configuration mode, use the exit command.	Router (tn3270-server) #	Router (config) # tn3270-server Router (tn3270-server) #
DLUR configuration	From TN3270 configuration mode, use the dlur command. To exit to TN3270 configuration mode, use the exit command.	Router (tn3270-dlur) #	Router (config) # tn3270-server Router (tn3270-server) # dlur Router (tn3270-dlur) #
DLUR SAP configuration	From DLUR configuration mode, use the lsap command. To exit to DLUR configuration mode, use the exit command.	Router (tn3270-dlur-sap) #	Router (config) # tn3270-server Router (tn3270-server) # dlur Router (tn3270-dlur) # lsap Router (tn3270-dlur-sap) #
PU configuration	From TN3270 server configuration mode or from DLUR configuration mode, use the PU command. To exit PU configuration mode, use the exit command.	Router (tn3270-pu) # Router (tn3270-dlur-pu) #	Router (config) # tn3270-server Router (tn3270-server) # pu PU1 05d00001 10.0.0.1 token-adapter 1 8 rmac 4000.0000.0001 rsap 4 Router (tn3270-pu) #

Using the No and Default Forms of Commands

Almost every configuration command also has a **no** form. In general, use the **no** form to disable a feature or function. Use the command without the keyword **no** to reenable a disabled feature or to enable a feature that is disabled by default. For example, IP routing is enabled by default. To disable IP routing, specify the **no ip routing** command and specify **ip routing** to reenable it. The Cisco IOS software command references provides the complete syntax for the configuration commands and describes what the **no** form of a command does.

Configuration commands can also have a **default** form. The **default** form of a command returns the command setting to its default. Most command are disabled by default, so the **default** form is the same as the **no** form. However, some commands are enabled by default and have variables set to certain default values. In these cases, the **default** command enables the command and sets variables to their default values. The Cisco IOS software command references describe what the **default** form of a command does if the command is not the same as the **no** form.

Get Context-Sensitive Help

Entering a question mark (?) at the system prompt displays a list of commands available for each command mode. You can also get a list of any command's associated keywords and arguments with the context-sensitive help feature.

To get help specific to a command mode, a command, a keyword, or arguments, perform one of the following tasks:

Task	Command
Obtain a brief description of the help system in any command mode.	help
Obtain a list of commands that begin with a particular character string.	<i>abbreviated-command-entry?</i>
Complete a partial command name.	<i>abbreviated-command-entry<Tab></i>
List all commands available for a particular command mode.	?
List a command's associated keywords.	<i>command ?</i>
List a keyword's associated arguments.	<i>command keyword ?</i>

When using context-sensitive help, the space (or lack of a space) before the question mark (?) is significant. To obtain a list of commands that begin with a particular character sequence, type in those characters followed immediately by the question mark (?). Do not include a space. This form of help is called *word help*, because it completes a word for you.

To list keywords or arguments, enter a question mark (?) in place of a keyword or argument. Include a space before the ?. This form of help is called *command syntax help*, because it reminds you which keywords or arguments are applicable based on the command, keywords, and arguments you already have entered.

You can abbreviate commands and keywords to the number of characters that allow a unique abbreviation. For example, you can abbreviate the **show** command to **sh**.

Enter the **help** command (which is available in any command mode) for a brief description of the help system:

```
Router# help
Help may be requested at any point in a command by entering
a question mark '?'. If nothing matches, the help list will
be empty and you must back up until entering a '?' shows the
available options.
```

Two styles of help are provided:

1. Full help is available when you are ready to enter a command argument (e.g. 'show ?') and describes each possible argument.
2. Partial help is provided when an abbreviated argument is entered and you want to know what arguments match the input (e.g. 'show pr?'.)

As described in the **help** command output, you can enter a partial command name and a question mark (?) to obtain a list of commands beginning with a particular character set. (See the section “Complete a Partial Command Name” later in this chapter for more details.)

Example of Context Sensitive Help

The following example illustrates how the context-sensitive help feature enables you to create an access list from configuration mode.

Enter the letters **co** at the system prompt followed by a question mark (?). Do not leave a space between the last letter and the question mark (?). The system provides the commands that begin with **co**.

```
Router# co?  
configure connect copy
```

Enter the **configure** command followed by a space and a question mark (?) to list the command's keywords and a brief explanation:

```
Router# configure ?  
memory      Configure from NV memory  
network     Configure from a TFTP network host  
terminal    Configure from the terminal  
<cr>
```

Enter the **terminal** keyword to enter configuration mode from the terminal:

```
Router# configure terminal  
Enter configuration commands, one per line. End with CNTL/Z.  
Router(config)#
```

Enter the **access-list** command followed by a space and a question mark (?) to list the command's keywords:

```
Router(config)# access-list ?  
<1-99>      IP standard access list  
<100-199>   IP extended access list  
<1000-1099> IPX SAP access list  
<1100-1199> Extended 48-bit MAC address access list  
<200-299>   Protocol type-code access list  
<300-399>   DECnet access list  
<400-499>   XNS standard access list  
<500-599>   XNS extended access list  
<600-699>   Appletalk access list  
<700-799>   48-bit MAC address access list  
<800-899>   IPX standard access list  
<900-999>   IPX extended access list
```

The two numbers within the angle brackets represent an inclusive range. Enter the access list number **99** and then enter another question mark (?) to see the arguments that apply to the keyword and brief explanations:

```
Router(config)# access-list 99 ?  
deny      Specify packets to reject  
permit    Specify packets to forward
```

Enter the **deny** argument followed by a question mark (?) to list additional options:

```
Router(config)# access-list 99 deny ?
A.B.C.D Address to match
```

Generally, uppercase letters represent variables, though this is not always the case. Enter the IP address followed by a question mark (?) to list additional options:

```
Router(config)# access-list 99 deny 131.108.134.0 ?
A.B.C.D Mask of bits to ignore
<cr>
```

The <cr> symbol appears in the list to indicate that one of your options is to press Return to execute the command.

The other option is to add a wildcard mask. Enter the wildcard mask followed by a question mark (?) to list further options.

```
Router(config)# access-list 99 deny 131.108.134.0 0.0.0.255 ?
<cr>
```

```
Router(config)# access-list 99 deny 131.108.134.0 0.0.0.255
```

The <cr> symbol by itself indicates there are no more keywords or arguments. Press Return to execute the command. The system adds an entry to access list 99 that denies access to all hosts on subnet 131.108.134.0.

Display Help for All User-Level Commands

To configure a line to display help for the full set of user-level commands during all sessions, perform the following tasks in line configuration mode:

Task	Command
Configure a line or lines to receive help for the full set of user-level commands when a user presses ?.	full-help

To configure the current session to display help for the full set of user-level commands, perform the following task in user **exec** mode:

Task	Command
Configure this session to provide help for the full set of user-level commands.	terminal full-help

The **full-help** and **terminal full-help** commands enable (or disable) a display of all help messages available from the terminal. They are used with the **show** command.

The following example is output for **show ?** with **terminal full-help** disabled and then enabled:

```
Router> show ?
bootflash  Boot Flash information
calendar   Display the hardware calendar
clock      Display the system clock
context    Show context information
dialer     Dialer parameters and statistics
history    Display the session command history
hosts      IP domain-name, lookup style, nameservers, and host table
isdn       ISDN information
kerberos   Show Kerberos Values
```

Check Command Syntax

```
modemcap  Show Modem Capabilities database
ppp       PPP parameters and statistics
rmon      rmon statistics
sessions  Information about Telnet connections
snmp      snmp statistics
terminal  Display terminal configuration parameters
users     Display information about terminal lines
version   System hardware and software status
```

```
Router> terminal full-help
```

```
Router> show ?
```

```
access-expression  List access expression
access-lists       List access lists
aliases            Display alias commands
apollo            Apollo network information
appletalk         AppleTalk information
arp              ARP table
async            Information on terminal lines used as router interfaces
bootflash        Boot Flash information
bridge           Bridge Forwarding/Filtering Database [verbose]
bsc              BSC interface information
bstun            BSTUN interface information
buffers          Buffer pool statistics
calendar         Display the hardware calendar
cdp              CDP information
clns             CLNS network information
clock            Display the system clock
cls             DLC user information
cmns            Connection-Mode networking services (CMNS) information
...
x25             X.25 information
xns             XNS information
xremote         XRemote statistics
```

Check Command Syntax

The user interface provides error isolation in the form of an error indicator, a caret symbol (^). The ^ symbol appears at the point in the command string where you have entered an incorrect command, keyword, or argument.

In the following example, suppose you want to set the clock. Use context-sensitive help to check the syntax for setting the clock.

```
Router# clock ?
set  Set the time and date
Router# clock
```

The help output shows that the **set** keyword is required. Check the syntax for entering the time:

```
Router# clock set ?
hh:mm:ss  Current time
Router# clock set
```

Enter the current time:

```
Router# clock set 13:32:00
% Incomplete command.
```

The system indicates that you need to provide additional arguments to complete the command. Press **Ctrl-P** (see the next section, “Use the Command History Features”) to automatically repeat the previous command entry. Then add a space and question mark (?) to reveal the additional arguments:

```
Router# clock set 13:32:00 ?
<1-31>      Day of the month
January     Month of the year
February
March
April
May
June
July
August
September
October
November
December
```

Now you can complete the command entry:

```
Router# clock set 13:32:00 23 February 97
^
% Invalid input detected at '^' marker.
```

The caret symbol (^) and help response indicate an error at 97. To list the correct syntax, enter the command up to the point where the error occurred and then enter a question mark (?):

```
Router# clock set 13:32:00 23 February ?
<1993-2035> Year
Router# clock set 13:32:00 23 February
```

Enter the year using the correct syntax and press Return to execute the command.

```
Router# clock set 13:32:00 23 February 1997
```

Use the Command History Features

With the current Cisco IOS release, the user interface provides a history or record of commands that you have entered. This feature is particularly useful for recalling long or complex commands or entries, including access lists. With the command history feature, you can complete the tasks in the following sections:

- Set the Command History Buffer Size
- Recall Commands
- Disable the Command History Feature

Set the Command History Buffer Size

By default, the system records 10 command lines in its history buffer. To set the number of command lines that the system will record during the current terminal session, complete the following task in EXEC mode:

Task	Command
Enable the command history feature for the current terminal session.	terminal history [<i>size number-of-lines</i>]

The **terminal no history size** command resets the number of lines saved in the history buffer to the default of 10 lines.

To configure the number of command lines the system will record for all sessions on a particular line, complete the following task in line configuration mode:

Task	Command
Enable the command history feature.	history [<i>size number-of-lines</i>] ¹

1. The **no history** command turns off command history for the line.

Recall Commands

To recall commands from the history buffer, perform one of the following tasks:

Task	Key Sequence/Command
Recall commands in the history buffer, beginning with the most recent command. Repeat the key sequence to recall successively older commands.	Press Ctrl-P or the up arrow key. ¹
Return to more recent commands in the history buffer after recalling commands with Ctrl-P or the up arrow key. Repeat the key sequence to recall successively more recent commands.	Press Ctrl-N or the down arrow key. ¹
While in EXEC mode, list the last several commands you have just entered.	show history

1. The arrow keys function only on ANSI-compatible terminals such as VT100s.

Disable the Command History Feature

The command history feature is automatically enabled. To disable it during the current terminal session, complete the following task in EXEC mode:

Task	Command
Disable the command history feature for the current session.	terminal no history

To configure a specific line so that the command history feature is disabled, complete the following task in line configuration mode:

Task	Command
Configure the line so that the command history feature is disabled.	no history

Use the Editing Features

The current software release includes an enhanced editing mode that provides a set of editing key functions similar to those of the Emacs editor.

You can enter commands in uppercase, lowercase, or a mix of both. Only passwords are case sensitive. You can abbreviate commands and keywords to the number of characters that allow a unique abbreviation. For example, you can abbreviate the **show** command to **sh**. After entering the command line at the system prompt, press the Return key to execute the command.

The following subsections are included in this section:

- Enable Enhanced Editing Mode
- Move Around on the Command Line
- Complete a Partial Command Name
- Paste in Buffer Entries
- Edit Command Lines that Wrap
- Delete Entries
- Scroll Down a Line or a Screen
- Redisplay the Current Command Line
- Transpose Mistyped Characters
- Control Capitalization
- Designate a Keystroke as a Command Entry
- Disable Enhanced Editing Mode

Enable Enhanced Editing Mode

Although enhanced editing mode is automatically enabled with the current Cisco IOS release, you can disable it and revert to the editing mode of previous Cisco IOS releases. (See the section “Disable Enhanced Editing Mode” later in this chapter.)

To reenable the enhanced editing mode for the current terminal session, complete the following task in EXEC mode:

Task	Command
Enable the enhanced editing features for the current terminal session.	terminal editing

To reconfigure a specific line to have enhanced editing mode, complete the following task in line configuration mode:

Task	Command
Enable the enhanced editing features.	editing

Move Around on the Command Line

Perform the following tasks to move the cursor around on the command line to make corrections or changes:

Task	Keystrokes
Move the cursor back one character.	Press Ctrl-B or press the left arrow key. ¹
Move the cursor forward one character.	Press Ctrl-F or press the right arrow key. ¹
Move the cursor to the beginning of the command line.	Press Ctrl-A .
Move the cursor to the end of the command line.	Press Ctrl-E .

Task	Keystrokes
Move the cursor back one word.	Press Esc B .
Move the cursor forward one word.	Press Esc F .

1. The arrow keys function only on ANSI-compatible terminals such as VT100s.

Complete a Partial Command Name

If you cannot remember a complete command name, press the Tab key to allow the system to complete a partial entry. To do so, perform the following task:

Task	Keystrokes
Complete a command name.	Enter the first few letters and press the Tab key.

If your keyboard does not have a Tab key, press **Ctrl-I** instead.

In the following example, when you enter the letters **conf** and press the Tab key, the system provides the complete command:

```
Router# conf<Tab>  
Router# configure
```

If you enter a set of characters that could indicate more than one command, the system beeps to indicate an error. Enter a question mark (?) to obtain a list of commands that begin with that set of characters. Do not leave a space between the last letter you enter and the question mark (?).

For example, there are three commands in privileged mode that start with **co**. To see what they are, type **co?** at the privileged EXEC prompt:

```
Router# co?  
configure connect copy  
Router# co
```

Paste in Buffer Entries

The system provides a buffer that contains the last 10 items you deleted. To recall these items and paste them in the command line, perform the following tasks:

Task	Keystrokes
Step 1 Recall the most recent entry in the buffer.	Press Ctrl-Y .
Step 2 Recall the next buffer entry.	Press Esc Y .

The buffer contains only the last 10 items you have deleted or cut. If you press **Esc Y** more than 10 times, you will cycle back to the first buffer entry.

Edit Command Lines that Wrap

The new editing command set provides a wraparound feature for commands that extend beyond a single line on the screen. When the cursor reaches the right margin, the command line shifts 10 spaces to the left. You cannot see the first ten characters of the line, but you can scroll back and check the syntax at the beginning of the command. To scroll back, perform the following task:

Task	Keystrokes
Return to the beginning of a command line to verify that you have entered a lengthy command correctly.	Press Ctrl-B or the left arrow key repeatedly until you scroll back to the beginning of the command entry, or press Ctrl-A to return directly to the beginning of the line. ¹

1. The arrow keys function only on ANSI-compatible terminals such as VT100s.

In the following example, the **access-list** command entry extends beyond one line. When the cursor first reaches the end of the line, the line is shifted 10 spaces to the left and redisplayed. The dollar sign (\$) indicates that the line has been scrolled to the left. Each time the cursor reaches the end of the line, the line is again shifted 10 spaces to the left.

```
Router(config)# access-list 101 permit tcp 131.108.2.5 255.255.255.0 131.108.1
Router(config)# $ 101 permit tcp 131.108.2.5 255.255.255.0 131.108.1.20 255.25
Router(config)# $t tcp 131.108.2.5 255.255.255.0 131.108.1.20 255.255.255.0 eq
Router(config)# $108.2.5 255.255.255.0 131.108.1.20 255.255.255.0 eq 45
```

When you have completed the entry, press **Ctrl-A** to check the complete syntax before pressing the Return key to execute the command. The dollar sign (\$) appears at the end of the line to indicate that the line has been scrolled to the right:

```
Router(config)# access-list 101 permit tcp 131.108.2.5 255.255.255.0 131.108.1$
```

The Cisco IOS software assumes you have a terminal screen that is 80 columns wide. If you have a width other than that, use the **terminal width** command to set the width of your terminal.

Use line wrapping in conjunction with the command history feature to recall and modify previous complex command entries. See the section “Recall Commands” in this chapter for information about recalling previous command entries.

Delete Entries

Perform any of the following tasks to delete command entries if you make a mistake or change your mind:

Task	Keystrokes
Erase the character to the left of the cursor.	Press the Delete or Backspace key.
Delete the character at the cursor.	Press Ctrl-D .
Delete all characters from the cursor to the end of the command line.	Press Ctrl-K .
Delete all characters from the cursor to the beginning of the command line.	Press Ctrl-U or Ctrl-X .
Delete the word to the left of the cursor.	Press Ctrl-W .
Delete from the cursor to the end of the word.	Press Esc D .

Scroll Down a Line or a Screen

When you use the help facility to list the commands available in a particular mode, the list is often longer than the terminal screen can display. In such cases, a `---More---` prompt is displayed at the bottom of the screen. To view the next line or screen, complete the following tasks:

Task	Keystrokes
Scroll down one line.	Press the Return key.
Scroll down one screen.	Press the Space bar.

Note The `---More---` prompt is used for any output that has more lines than can be displayed on the terminal screen, including **show** command output. You can use the keystrokes listed above whenever you see the `---More---` prompt.

Redisplay the Current Command Line

If you are entering a command and the system suddenly sends a message to your screen, you can easily recall your current command line entry. To do so, perform the following task:

Task	Keystrokes
Redisplay the current command line.	Press Ctrl-L or Ctrl-R .

Transpose Mistyped Characters

If you have mistyped a command entry, you can transpose the mistyped characters by performing the following task:

Task	Keystrokes
Transpose the character to the left of the cursor with the character located at the cursor.	Press Ctrl-T .

Control Capitalization

You can capitalize or lowercase words or capitalize a set of letters with simple keystroke sequences. To do so, perform the following tasks:

Task	Keystrokes
Capitalize at the cursor.	Press Esc C .
Change the word at the cursor to lowercase.	Press Esc L .
Capitalize letters from the cursor to the end of the word.	Press Esc U .

Designate a Keystroke as a Command Entry

Sometimes you might want to use a particular keystroke as an executable command, perhaps as a shortcut. Complete the following task to insert a system code for this purpose:

Task	Keystrokes
Insert a code to indicate to the system that the keystroke immediately following should be treated as a command entry, <i>not</i> an editing key.	Press Ctrl-V or Esc Q .

Disable Enhanced Editing Mode

To globally disable enhanced editing mode and revert to the editing mode of previous software releases, perform the following task in line configuration mode:

Task	Command
Disable the enhanced editing features for a particular line.	no editing

To disable enhanced editing mode and revert to the editing mode of software releases before Cisco IOS release 9.21 for the current terminal session, perform the following task in EXEC mode:

Task	Command
Disable the enhanced editing features for the local line.	terminal no editing

For example, you might disable enhanced editing if you have prebuilt scripts that conflict when enhanced editing is enabled. You can re-enable enhanced editing mode with the **editing** command or **terminal editing** command.

The editing keys and functions of software releases before 9.21 are listed in Table 3.

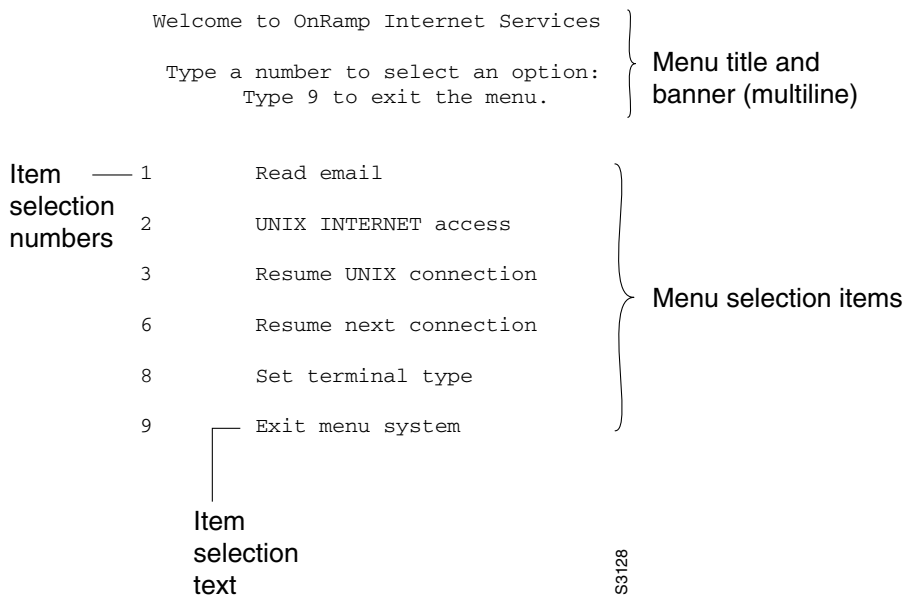
Table 3 Editing Keys and Functions for Software Release 9.1 and Earlier

Key	Function
Delete or Backspace	Erases the character to the left of the cursor.
Ctrl-W	Erases a word.
Ctrl-U	Erases a line.
Ctrl-R	Redisplays a line.
Ctrl-Z	Ends configuration mode and returns to the EXEC prompt.
Return	Executes single-line commands.

Create Menus

A menu is a displayed list of actions from which you can select without having to know anything about the underlying command-level details. A menu system effectively controls which functions a user can access. Figure 2 illustrates the parts that make up a typical menu.

Figure 2 Typical Menu Example



Create a Menu Task List

To create menus, perform the tasks in the following sections:

- Understand Menu Guidelines
- Specify the Menu Title
- Specify the Menu Prompt
- Specify the Menu Item Text
- Specify the Underlying Command for the Menu Item
- Specify the Default Command for the Menu
- Create a Submenu
- Create Hidden Menu Entries
- Specify Menu Display Configuration Options
- Specify Per-Item Menu Options
- Invoke the Menu
- Delete the Menu from the Configuration

Understand Menu Guidelines

Anyone who can enter configuration mode can create these menus. Keep the following guidelines in mind when you create menus:

- Each menu item represents a single user command.
- The menu system default is a standard “dumb” terminal that only displays text in a 24-line-by-80-column format.

- A menu can have a maximum of 18 menu items. Menus containing more than 9 menu items are automatically configured as single-spaced menus; menus containing 9 or fewer menu items are automatically configured as double-spaced menus, but can be configured as single-spaced menus using the **menu single-space** command. (For more information about menu display configuration options, refer to the section “Specify Menu Display Configuration Options” later in this chapter.)
- Item keys can be numbers, letters, or strings. If you use strings, you must configure the **menu line-mode** command.
- When you construct a menu, always specify how a user exits a menu and where the user goes. If you do not provide an exit from a menu—such as with the **menu-exit** command (described in the section “Specify the Underlying Command for the Menu Item” later in this section), there is no way to exit the menu.
- The **exec-timeout** command can be used to close and clean up an idle menu; the **session-timeout** command can be used to clean up a menu with an open connection.

Specify the Menu Title

You can specify an identifying title for the menu. To specify the menu title, perform the following task in global configuration mode:

Task	Command
Specify the title for the menu.	menu name title delimiter title delimiter

The following example specifies the title that is displayed when the OnRamp menu is selected. The following four main elements create the title:

- The **menu title** command
- Delimiter characters that open and close the title text
- Escape characters to clear the screen (optional)
- Title text

The following example shows the command used to create the title for the menu shown in Figure 3, at the beginning of this section:

```
Router(config)# menu OnRamp title /^[H^[[J
Enter TEXT message. End with the character '/'.
    Welcome to OnRamp Internet Services

    Type a number to select an option;
    Type 9 to exit the menu.
/
Router(config)#
```

You can position the title of the menu horizontally by preceding the title text with blank characters. You can also add lines of space above and below the title by pressing Enter.

In this example, the title text consists of the following:

- One-line title
- Space
- Two-line menu instruction banner

Title text must be enclosed within text delimiter characters—the slash character (/) in this example. Title text delimiters are characters that do not ordinarily appear within the text of a title, such as slash (/), double quote ("), or tilde (~). You can use any character that is not likely to be used within the text of the title as delimiter characters. Ctrl-C is reserved for special use and should not be used in the text of the title.

This title text example also includes an escape character sequence to clear the screen before displaying the menu. In this case the string `^[H^[J` is an escape string used by many VT100-compatible terminals to clear the screen. To enter it, you must enter **Ctrl-V** before each escape character (^).

You can also use the **menu clear-screen** command to clear the screen before displaying menus and submenus, instead of embedding a terminal-specific string in the menu title. This option uses a terminal-independent mechanism based on termcap entries defined in the router and the terminal type configured for the user's terminal. The **menu clear-screen** command allows the same menu to be used on multiple types of terminals instead of having terminal-specific strings embedded within menu titles. If the termcap entry does not contain a clear string, the menu system inserts 24 new lines, causing all existing text to scroll off the top of the terminal screen.

To clear the screen before displaying the menu, perform the following task in global configuration mode:

Task	Command
Specify screen clearing before displaying menus and submenus.	menu name clear-screen

The following example clears the screen before displacing the OnRamp menu or a submenu:

```
Router(config)# menu OnRamp clear-screen
```

Specify the Menu Prompt

You can specify a prompt for the menu. To specify the menu prompt, perform the following task in global configuration mode:

Task	Command
Specify the prompt for the menu.	menu name prompt delimiter prompt delimiter

Specify the Menu Item Text

Each displayed menu entry consists of the selection key (number, letter, or string) and the text describing the action to be performed. You can specify descriptive text for a maximum of 18 menu items. Because each menu entry represents a single user interface command, you must specify the menu item text one entry at a time. To specify the menu item text, perform the following task in global configuration mode:

Task	Command
Specify the text for the menu item.	menu name text item text

The following example specifies the text that is displayed for the three entries in the OnRamp menu:

```
Router(config)# menu OnRamp text 1 Read email
Router(config)# menu OnRamp text 2 UNIX Internet Access
Router(config)# menu OnRamp text 9 Exit menu system
```

You can provide access to context-sensitive help by creating a “help server” host and use a menu entry to make a connection to that host.

Menu selection keys do not need to be contiguous. You can provide consistency across menus by assigning a particular number, letter, or string to a special function—such as Help or Exit—regardless of the number of menu entries in a given menu. For example, menu entry H could be reserved for help across all menus.

When more than nine menu items are defined in a menu, the **menu line-mode** and **menu single-space** commands are activated automatically. The commands can be configured explicitly for menus of nine items or fewer. For more information on these commands, refer to the section “Specify Menu Display Configuration Options” later in this chapter.

Specify the Underlying Command for the Menu Item

Each displayed menu entry issues a user interface command when the user enters its key. Each menu entry can have only a single command associated with it. To specify the menu item command, perform the following task in global configuration mode:

Task	Command
Specify the command to be performed when the menu item is selected.	menu <i>name</i> command <i>item</i> <i>command</i>

The following example specifies the commands that are associated with the three entries in the OnRamp menu:

```
Router(config)# menu OnRamp command 1 rlogin mailsys
Router(config)# menu OnRamp command 2 rlogin unix.cisco.com
Router(config)# menu OnRamp command 9 menu-exit
```

The **menu-exit** command is available only from within menus. This command provides a way to return to a higher-level menu or to exit the menu system.

When a menu item allows connections (their normal use), the menu item should also contain entries that can be used to resume connections; otherwise, when a user escapes from a connection and returns to the menu, there is no way to resume the session and it will sit idle until the user logs off.

You can build the **resume connection** EXEC command into a menu entry so that the user can resume a connection, or you can configure the line using the **escape-char none** command to prevent users from escaping their sessions.

To specify connection resumption as part of the menu item command, perform the following task in global configuration mode:

Task	Command
Specify the command to be performed when the menu item is selected.	menu <i>name</i> command <i>item</i> resume [<i>connection</i>] /connect [<i>connect string</i>]

Embedding the **resume** command within the **menu** command permits a user to resume the named connection or make another connection using the specified name, if there is no active connection by that name. As an option, you can also supply the connect string needed to connect initially. When you do not supply this connect string, the command uses the specified connection name.

You can use the **resume** command in the following menu entries:

- Embedded in a menu entry

- As a separate, specific menu entry
- As a “rotary” menu entry

In the following example, the **resume** command is embedded in the **menu** command so that selecting the menu item either starts the specified connection session (if one is not already open) or resumes the session (if one is already open):

```
Router(config)# menu Duluth text 1 Read email
Router(config)# menu Duluth command 1 resume mailsys /connect rlogin mailsys
```

In the following example, the **resume** command is used in a separate menu entry (entry 3) to resume a specific connection:

```
Router(config)# menu Duluth text 3 Resume UNIX Internet Access
Router(config)# menu Duluth command 3 resume unix.cisco.com
```

You use the **resume/next** command to resume the next open connection in the user’s list of connections. This command allows you to create a single menu entry that steps through all of the user’s connections. To specify **resume/next** connection resumption as part of the menu item command, perform the following task in global configuration mode:

Task	Command
Specify resume/next connection resumption.	menu name command item resume /next

The following example shows a menu entry (entry 6) created to step through all of the user’s connections:

```
Router(config)# menu Duluth text 6 Resume next connection
Router(config)# menu Duluth command 6 resume /next
```

Specify the Default Command for the Menu

When a user presses Enter without specifying an item, the router performs the command for the default item. To specify the default item, perform the following task in global configuration mode:

Task	Command
Specify the command to be performed when no item is specified.	menu name default item

Create a Submenu

To create submenus that are opened by selecting a higher-level menu entry, use the **menu** command to invoke a menu in a line menu entry. To specify a submenu item command, perform the following task in global configuration mode:

Task	Command
Step 1 Specify the menu item that invokes the submenu.	menu name text item text
Step 2 Specify the command to be performed when the menu item is selected.	menu name command item menu name2
Step 3 Specify the title for the submenu.	menu name2 title delimiter title2 delimiter
Step 4 Specify the submenu item.	menu name2 text item text

Task	Command
Step 5 Specify the commands to be performed when the submenu item is selected.	<code>menu name2 command item command</code>

The following example specifies that the menu item (entry 8) activates the submenu in the OnRamp menu:

```
Router(config)# menu OnRamp text 8 Set terminal type
```

The following example specifies the command that is performed when the menu item (entry 8) is selected in the OnRamp menu:

```
Router(config)# menu OnRamp command 8 menu Terminals
```

The following example specifies the title for the Terminals submenu:

```
Router(config)# menu Terminals title /
                Supported Terminal Types

                Type a number to select an option;
                Type 9 to return to the previous menu.
```

The following example specifies the submenu items for the Terminals submenu:

```
Router(config)# menu Terminals text 1 DEC VT420 or similar
Router(config)# menu Terminals text 2 Heath H-19
Router(config)# menu Terminals text 3 IBM 3051 or equivalent
Router(config)# menu Terminals text 4 Macintosh with gterm emulator
Router(config)# menu Terminals text 9 Return to previous menu
```

The following example specifies the commands associated with the items in the Terminals submenu:

```
Router(config)# menu Terminals command 1 term terminal-type vt420
Router(config)# menu Terminals command 2 term terminal-type h19
Router(config)# menu Terminals command 3 term terminal-type ibm3051
Router(config)# menu Terminals command 4 term terminal-type gterm
Router(config)# menu Terminals command 9 menu-exit
```

When you select entry 8 on the main menu, the Terminals submenu appears:

```
                Supported Terminal Types

                Type a number to select an option;
                Type 9 to return to the previous menu.

1          DEC VT420 or similar
2          Heath H-19
3          IBM 3051 or equivalent
4          Macintosh with gterm emulator
9          Return to previous menu
```

Note If you nest too many levels of menus, the system prints an error message on the terminal and returns to the previous menu level.

Create Hidden Menu Entries

A hidden menu entry is a menu item that contains a selection key but no associated text describing the action to be performed. Include this type of menu entry to aid system administrators who help users. The normal procedure is to specify a menu command but omit specifying any text for the item. To specify a hidden menu item, perform the following task in global configuration mode:

Task	Command
Specify the command to be performed when the hidden menu entry is selected.	menu <i>name</i> command <i>item</i> <i>command</i>

The following example shows the command associated with the submenu entry in the OnRamp menu:

```
Router(config)# menu OnRamp command 7 show whoami
```

The **show whoami** command can be included in menus to aid system administrators who help users. If text is included as an argument in the command, that text is displayed as part of the additional data about the line, and helps identify exactly which menu or submenu the user is accessing. Because the **show whoami** command is hidden inside the menu entry, this information might not be otherwise available. For example, the hidden menu entry created by the line in the configuration file `menu OnRamp command 7 show whoami` Terminals submenu of OnRamp Internet Access menu might display information similar to the following:

```
Comm Server "cs101", Line 0 at 0 bps. Location "Second floor, West"
Additional data: Terminals submenu of OnRamp Internet Access menu
```

To prevent the information from being lost if the menu display clears the screen, this command always displays a More prompt before returning.

Specify Menu Display Configuration Options

In addition to the **menu clear-screen** command, described in the section “Specify the Menu Title,” the following are the three other **menu** commands that define menu functions:

- **menu line-mode**
- **menu single-space**
- **menu status-line**

Using Line Mode in Menus

In a menu of nine or fewer items, you ordinarily select a menu item by entering the item number or a letter. In line mode, you select a menu entry by entering the item key and pressing Enter. The line mode allows you to backspace over the selection and enter another before pressing Enter to issue the command. This function allows you to change the selection before you invoke the command.

To invoke the **line-mode** option, perform the following task in global configuration mode:

Task	Command
Specify line-mode operation.	menu <i>name</i> line-mode

The line-mode option is invoked automatically when more than nine menu items are defined, but it can also be configured explicitly for menus of nine items or fewer.

In order to use strings as selection keys, you must enable the **menu line-mode** command.

Displaying Single-Spaced Menus

If there are nine or fewer menu items, the Cisco IOS software ordinarily displays the menu items double-spaced. In a menu of more than nine items, the **single-space** option is activated automatically to fit the menu into a normal 24-line terminal screen. However, the single-space option also can be configured explicitly for menus of nine or fewer items.

To invoke the **single-space** option, perform the following task in global configuration mode:

Task	Command
Specify single-space operation.	menu name single-space

Displaying an Informational Status Line

The **status-line** option displays a line of status information about the current user at the top of the terminal screen before the menu title is displayed. This status line includes the router's host name, the user's line number, and the current terminal type and keymap type (if any).

To display the **status-line** option, perform the following task in global configuration mode:

Task	Command
Display a status line when using a menu.	menu name status-line

Specify Per-Item Menu Options

To configure per-item options, perform either or both of the following tasks in global configuration mode:

Task	Command
After the command is issued, pause before redrawing the menu. Enter this command once for each menu item that pauses.	menu name options item pause
Require a login before the command. Enter this command once for each menu item that requires a login.	menu name options item login

Invoke the Menu

To invoke the menu, perform the following task at the EXEC prompt:

Task	Command
Invoke the menu by specifying the name of the menu.	menu name

You can define menus containing privileged EXEC commands, but users must have privileged access when they start up the menu.

To ensure that a menu is automatically invoked on a line, make sure the menu does not have any exit paths that leave users in an interface they cannot operate, then configure that line with the command **autocommand menu menu_name**.

Menus also can be invoked on a per-user basis by defining an **autocommand** for that local username.

Invoke a Menu Example

The following example invokes the *OnRamp* menu:

```
Router> menu OnRamp

Welcome to OnRamp Internet Services

Type a number to select an option;
Type 9 to exit the menu.

1 Read email
2 UNIX Internet access
3 Resume UNIX connection

6 Resume next connection

9 Exit menu system
```

Delete the Menu from the Configuration

To delete the menu from the configuration, perform the following task in global configuration mode:

Task	Command
Delete the menu by specifying the menu name.	no menu <i>name</i>

The following example deletes the OnRamp menu from the configuration:

```
Router(config)# no menu OnRamp
```

Sample Menu Configuration

The following example allows menu users to Telnet to one of three different machines. The user can also view the output of the **show user** command and exit the menu. One hidden menu item, specified by the selection here, allows system administrators to view the current software version.

```
menu new title ^C

Telnet Menu

^C
menu new prompt ^C

Please enter your selection: ^C
menu new text 1 telnet system1
menu new command 1 telnet system1
menu new options 1 pause
menu new text 2 telnet system2
menu new command 2 telnet system2
menu new options 2 pause
menu new text b telnet systemblue
menu new command b telnet systemblue
menu new options b pause
menu new text me show user
menu new command me show user
menu new options me pause
```

```
menu new command here show version
menu new text Exit Exit
menu new command Exit menu-exit
menu new clear-screen
menu new status-line
menu new default me
menu new line-mode
!
```

Use the Cisco Web Browser Interface to Issue Commands

You can issue most of the Cisco IOS commands using a Web browser. This Cisco IOS feature is accessed by using the Cisco Web browser interface, which is accessed from the router's home page. (All Cisco routers and access servers loaded with the latest version of Cisco IOS software have a home page, which is password protected.)

From the router's home page, you click on a hypertext link titled "Monitor the Router." This link takes you to a Web page that has a "Command" field. You can type commands in this field as if you were entering commands at a terminal connected to the router. The page also displays a list of commands. You can execute these commands by clicking on them, as if you were clicking on hypertext links.

Cisco Web Browser Interface Task List

To use the Cisco Web browser interface to issue commands, perform the tasks in the following sections:

- Configure the Cisco Web Browser Interface
- Use the Correct Hardware and Software
- Access Your Router's Home Page
- Issue Commands Using the Cisco Web Browser Interface
 - Enter Commands Using Hypertext Links
 - Enter Commands Using the Command Field
 - Enter Commands Using the URL Window

Configure the Cisco Web Browser Interface

You can enable the Cisco Web browser interface on any router running Cisco IOS Release 11.0(6) or later software. Once enabled, you will be able to issue Cisco IOS commands to your router using a Web browser.

The Web browser interface is automatically enabled when you use ClickStart to configure a Cisco 1003, Cisco 1004, or Cisco 1005 router.

If you have any other Cisco router, you must enable the Web browser interface by altering the routers' configuration. To do this, perform the tasks in the following list. The first task is required; the remaining are optional.

- Enable the Cisco Web Browser Interface
- Change the Cisco Web Browser Interface Port Number
- Control Access to the Cisco Web Browser Interface
- Specify the Method for User Authentication

Enable the Cisco Web Browser Interface

To enable a Cisco router to be configured from a browser using the Cisco Web browser interface, perform the following task in global configuration mode:

Task	Command
Enable a router to be reconfigured using the Cisco Web browser interface.	ip http server

Now that the Cisco Web browser interface is enabled, you can perform any of the optional tasks or proceed to configure a router using the Cisco Web browser interface.

Change the Cisco Web Browser Interface Port Number

By default, the Cisco Web browser interface uses port 80 on the router. To assign the Cisco Web browser interface to a different port, perform the following task in global configuration mode:

Task	Command
Assign a port number to be used by the Cisco Web browser interface.	ip http port <i>number</i>

Control Access to the Cisco Web Browser Interface

To control which hosts can access the http server used by the Cisco Web browser interface, perform the following task in global configuration mode:

Task	Command
Control access to the http server used by the Cisco Web browser interface.	ip http access-class {<i>access-list-number</i> <i>name</i>}

Specify the Method for User Authentication

To specify how HTTP server users are authenticated, perform the following task in global configuration mode:

Task	Command
Specify how HTTP server users are authenticated.	ip http authentication {<i>aaa</i> enable local tacacs}

Use the Correct Hardware and Software

To use the Cisco Web browser interface, your computer must have a World Wide Web browser. The Cisco Web browser interface works with most browsers, including Netscape Navigator. Your Web browser must be able read and submit forms. The original versions of Mosaic might have problems using the Cisco Web browser interface, because they either cannot submit forms or have difficulty doing so.

The computer must be connected to the same network that the router or access server is on.

Access Your Router's Home Page

Cisco IOS Release 11.0(6) or later software allows users with a default privilege level of 15 to access a predefined home page for a router or access server. If you have been assigned a privilege level other than 15, Cisco IOS Release 11.3 or later software allows you to issue Cisco IOS commands from a Web page where the commands defined for your specific user privilege level will be displayed.

To access the home page for your router or access server with a default privilege level of 15, perform the following steps:

Step 1 Enter the following command in the URL field of your Web browser and press return:
http://router-name/. (For example, to access a Cisco router named *cacophony* with a default privilege level of 15, type `http://cacophony/`.)The browser then prompts you for the password.

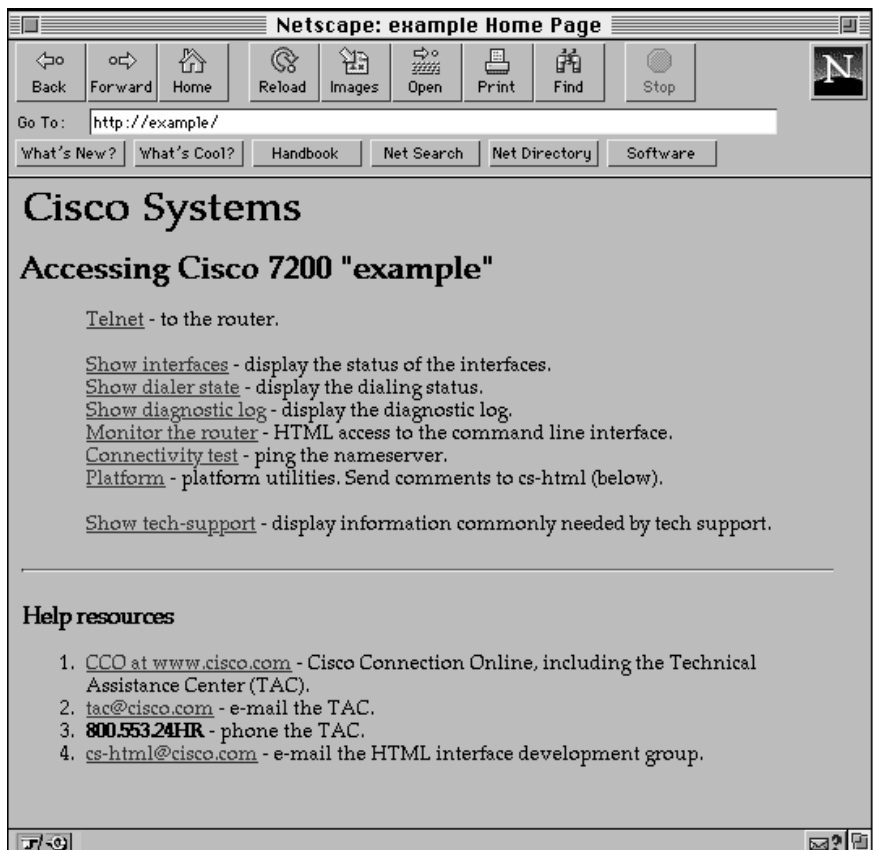
Step 2 Enter the password.

Note The name and password for your router and access server are designated in their configuration. Contact your network administrator if you do not have this information.

The browser should display the home page for your router or access server.

The router's home page looks something like the Cisco 7200 home page shown in Figure 3.

Figure 3 Example of a Home Page for a Cisco 7200



To access a router Web page for a preassigned privilege level other than the default of 15, perform the following steps:

- Step 1** Enter the following command in the URL field of your Web browser and press return:
http://router-name/level/level/model/command. (For example, to request a user privilege level of 12 on a Cisco router named *cacophony*, type `http://cacophony/level/12/exec`). The browser then prompts you for the username and/or password.
- Step 2** Depending on your authentication method, enter your username and/or password and press return. The Web browser should display a Web page specific to your user privilege level, mode, and the command you have requested.

Table 4 lists the URL arguments you must use when requesting a Web page.

Table 4 Description of the URL Arguments

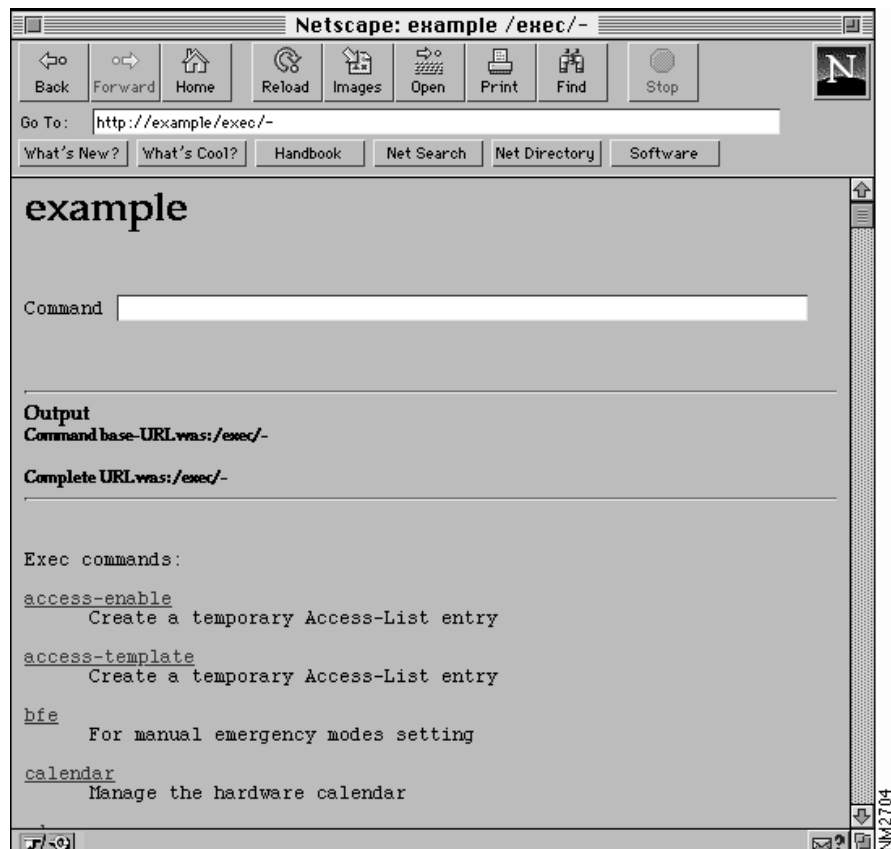
Argument	Description
<i>router-name</i>	Name of the router being configured.
<i>level</i>	The privilege level you are requesting.
<i>mode</i>	The mode the command will be executed in, such as exec, configure, and interface.

Argument	Description
<i>command</i>	(Optional) The command you want to execute. If you specify a command, your browser will display a Web page showing the results of the requested command. If you do not specify a command in the URL, your browser will display a Web page listing all of the commands available for your privilege level.

Issue Commands Using the Cisco Web Browser Interface

To issue commands using the Cisco Web browser interface, click the link “Monitor the router” in the first list of hypertext links on the home page. This displays the Web page shown in Figure 4.

Figure 4 The “Command” Field Web Page for a Router Named “example”



Enter Commands Using Hypertext Links

To enter a command using hypertext links, scroll through the commands listed at the bottom of the screen and click the one you want to execute. If the link is a complete command, it is executed. If the command has more parameters, another list of command hypertext links is displayed. Scroll through this second list and click the one you want to execute.

If the command is a request for information, like a **show** command, the information is displayed in the Web browser window.

If the command requires a variable, a form in which you can enter the variable is displayed.

Enter Commands Using the Command Field

Entering the command in the command field is just like entering it at a terminal console. Enter the command using the syntax documented in the Cisco IOS command reference. If you are uncertain of the options available for a particular command, type a question mark (?).

For example, entering **show ?** in the command field displays the parameters for the **show** command. The Cisco Web browser interface displays the parameters as hypertext links. To select a parameter, you can either click on one of the links, or you can enter the parameter in the command field.

Enter Commands Using the URL Window

You can issue a command using the URL window for the Web browser.

For example, to execute a **show configuration** command on a router named *example*, you would enter the following in the URL window:

```
http://example/exec/show/configuration
```

The Web browser then displays the configuration for the “example” router. To save effort, modify the URL in the URL window in the browser control bar instead of retyping the entire URL.

The difference between entering a command in the command field and entering a command in the URL window is that in the URL window, command modes, keywords, and options should be separated by slashes, not spaces.

Customize the User Interface on a Web Browser

You can customize HTML pages to display Cisco IOS command output and Cisco IOS platform-specific variables (for example, a router host name or router address typically used in router setup pages) for a Web browser. You can display this information using HTML formatted Server Side Includes (SSIs) that you insert into your custom HTML pages. SSIs are a Cisco IOS software feature described in the following sections.

Definition of SSIs

SSIs are HTML formatted commands or variables that you insert into HTML pages when you customize Cisco IOS platform configuration pages for a Web browser. These SSI commands and SSI variables display Cisco IOS command output and Cisco IOS platform-specific variables.

The Cisco IOS software supports two HTML SSI commands defined for customizing HTML pages: the SSI EXEC command and the SSI ECHO command. The HTML format of the SSI EXEC command is `<!--#exec cmd="xxx"-->`, and the HTML format of the SSI ECHO command is `<!--#echo var="yyy"-->`. (See the section “Customize HTML Pages Using SSIs” later in this chapter for a description of how to use these commands).

In addition to the two SSI commands, the Cisco IOS software supports several SSI variables defined for customizing HTML pages. SSI variables are used with the SSI ECHO command. There is one SSI variable defined for all Cisco IOS platforms (SERVER_NAME) and other SSI variables specifically defined for ISDN, Frame Relay, and asynchronous serial platforms. The format and a

description of all the available SSI variables are provided in Table 5. (See the section “Customize HTML Pages Using SSIs” later in this chapter for a description of how to use these SSI variables with the SSI ECHO command).

The SSI EXEC command is supported on all platforms. The SSI ECHO command, used with SSI variables, is supported on all platforms listed in Table 5.

Table 5 Description of SSI Variables

HTML Format of SSI Variable	Description of Variable Displayed on Browser Page	Cisco IOS Platform(s) This SSI Is Supported On
SERVER_NAME	Host name of the HTTP server.	All Cisco IOS platforms
EZSETUP_PASSWORD	Enable password (currently left blank).	Cisco 1000 series
EZSETUP_PASSWORD_VERIFY	Repeat of the enable password to verify accuracy (currently left blank).	Cisco 1000 series
EZSETUP_ETHERNET0_ADDRESS	IP address of the Ethernet 0 interface.	Cisco 1000 series
EZSETUP_ETHERNET0_MASK	IP mask of the Ethernet 0 interface.	Cisco 1000 series
EZSETUP_DNS_ADDRESS	DNS address used by the router.	Cisco 1000 series
EZSETUP_STANDARD_DEBUG_Y	Standard debug variable. Returns CHECKED if set to TRUE; otherwise, it is blank.	Cisco 1000 series
EZSETUP_STANDARD_DEBUG_N	Standard debug variable. Returns CHECKED if set to FALSE; otherwise, it is blank.	Cisco 1000 series
EZSETUP_ISDN_SWITCHTYPE	ISDN Switch type.	Cisco 1003 and Cisco 1004
EZSETUP_ISDN_REMOTE_NAME	Name of remote ISDN system.	Cisco 1003 and Cisco 1004
EZSETUP_ISDN_REMOTE_NUMBER	Phone number of remote ISDN system.	Cisco 1003 and Cisco 1004
EZSETUP_ISDN_CHAP_PASSWORD	CHAP password of remote ISDN system.	Cisco 1003 and Cisco 1004
EZSETUP_ISDN_SPID1	ISDN SPID 1.	Cisco 1003 and Cisco 1004
EZSETUP_ISDN_SPID2	ISDN SPID 2.	Cisco 1003 and Cisco 1004
EZSETUP_ISDN_SPEED_56	Speed of ISDN interface. Returns CHECKED if set to 56k; otherwise, it is blank.	Cisco 1003 and Cisco 1004
EZSETUP_ISDN_SPEED_64	Speed of ISDN interface. Returns CHECKED if set to 64k; otherwise, it is blank.	Cisco 1003 and Cisco 1004
EZSETUP_FR_ADDRESS	Frame-Relay IP address.	Cisco 1005
EZSETUP_FR_MASK	Frame-Relay IP mask.	Cisco 1005
EZSETUP_FR_DLCI	Frame-Relay DLCI.	Cisco 1005
EZSETUP_ASYNC_REMOTE_NAME	Name of remote system.	Cisco 1005
EZSETUP_ASYNC_REMOTE_NUMBER	Phone number of remote system.	Cisco 1005
EZSETUP_ASYNC_CHAP_PASSWORD	CHAP password for remote system.	Cisco 1005
EZSETUP_ASYNC_LINE_PASSWORD	Async line password.	Cisco 1005
EZSETUP_ASYNC_MODEM_SPEED	Speed of async modem (either 14.4k or 28.8k).	Cisco 1005
EZSETUP_ASYNC_MODEM_SPEED_144K	Returns CHECKED if async modem speed is 14.4k; otherwise it is blank.	Cisco 1005
EZSETUP_ASYNC_MODEM_SPEED_288K	Returns CHECKED if async modem speed is 28.8k; otherwise it is blank.	Cisco 1005

How SSIs Work

Once you have designed a set of HTML pages that include SSIs, you can copy these pages to a Cisco IOS platform's Flash memory. (See the section "Copy HTML Pages to Flash Memory" for instructions on storing HTML pages in Flash memory later in this section.) When you retrieve these pages from Flash memory and display them using a Web browser, any SSI command that was designed into these pages will either display Cisco IOS command output or display a current variable or identifier defined in Table 5. For example, the SSI ECHO command with the variable `SERVER_NAME` will display the current host name of the HTTP server you are using, and the SSI ECHO command with the variable `EZSETUP_ISDN_SWICHTYPE` will display the current ISDN switch type you are using.

Benefits of Customizing Web Pages with SSIs

Using SSIs, you can customize one set of international HTML pages (for example, in Japanese) and copy these pages to Flash memory on multiple Cisco IOS platforms. When you retrieve these pages from the Flash memory of a Cisco IOS platform, current variables and identifiers associated with the platform you are currently using are displayed. SSIs save you from having to duplicate these international pages (considered relatively large images that contain 8-bit or multibyte characters) and store them in the source code for each platform you are using. (Refer to Table 5 to determine which Cisco IOS platforms support which SSIs variables.)

User Interface Customization Task List

To customize your HTML pages and view them for the user interface, perform the tasks in the following sections:

- Customize HTML Pages Using SSIs
- Copy HTML Pages to Flash Memory
- Enable the Cisco Web Browser Interface
- View Your HTML File Containing SSIs

Customize HTML Pages Using SSIs

When you are customizing an HTML page for a Web browser, type `<!--#exec cmd="xxx"-->` in your HTML file where you want Cisco IOS command output to appear on the browser page. Replace `xxx` with a Cisco IOS command that can be executed in the router's EXEC mode. (See the "SSI EXEC Command Example" section later in this chapter.)

When you are customizing an HTML page for a Web browser, type `<!--#echo var="yyy"-->` in your HTML file where you want a value or identifier associated with a particular Cisco IOS platform (for example, an ISDN or Frame Relay platform) to appear on the browser page. Replace `yyy` with an SSI variable described in Table 5. (See the "SSI ECHO Command Example" section later in this chapter.)

Copy HTML Pages to Flash Memory

Once you have customized HTML pages using SSIs, copy your HTML pages to a Cisco IOS platform's Flash memory. To do this, save your pages using a filename appended with `.shtml` (for example, `filename.shtml`) and copy your file to Flash memory using a **copy** command (for example, the **copy tftp flash** command). (Refer to the Cisco IOS command references for a **copy** command compatible with your Cisco IOS platform.)

Enable the Cisco Web Browser Interface

To view the HTML pages you have just customized, you must first enable the Cisco Web browser interface. To enable the Cisco Web browser interface, perform the following task in global configuration mode:

Task	Command
Enable the Cisco Web browser interface.	ip http server

Refer to the section “Configure the Cisco Web Browser Interface” earlier in this chapter for further information on configuring the Cisco Web browser interface.

View Your HTML File Containing SSIs

Once the Cisco Web browser interface is enabled, you can retrieve your HTML page from Flash memory and view it on the Cisco Web browser by typing the URL **http://router/flash/filename** in the URL window. Replace *router* with the host name or IP address of the current Cisco IOS platform you are using, and replace *filename* with the name of the file you created with “.shtml” appended. For example, `http://myrouter/flash/ssi_file.shtml`.

SSI Configuration Examples

This section provides the following configuration examples:

- SSI EXEC Command Example
- SSI ECHO Command Example

SSI EXEC Command Example

The following is an example of the HTML SSI EXEC command used to display the Cisco IOS **show users** EXEC command output:

Contents of the HTML file in Flash memory:

```
<HTML>
<HEAD>
<TITLE> SSI EXEC Command Example</TITLE>
</HEAD>
<BODY>
This is an example of the SSI EXEC command
<HR>
<PRE>
<!--#exec cmd="show users"-->
</PRE>
<HR>
</BODY>
</HTML>
```

Contents that the Web browser receives when the HTML file is retrieved from Flash memory:

```
<HTML>
<HEAD>
<TITLE> SSI EXEC Command Example</TITLE>
</HEAD>
<BODY>
This is an example of the SSI EXEC command
<HR>
<PRE>
```

```
Line   User   Host(s) Idle   Location
0 con  0      idle   12
2 vty  0      idle   0    router.cisco.com

</PRE>
<HR>
</BODY>
</HTML>
```

SSI ECHO Command Example

The following is an example of the HTML SSI ECHO command used with the SSI variable *SERVER_NAME* (see Table 5) to display the Cisco IOS platform host name *rain*:

Contents of the HTML file in Flash memory:

```
<HTML>
<HEAD>
<TITLE>SSI Echo Command Example</TITLE>
</HEAD>
<BODY>
This is an example of the SSI echo command
<HR>
<!--#echo var="SERVER_NAME"-->
<HR>
</BODY>
</HTML>
```

Contents that the Web browser receives when the HTML file is retrieved from Flash memory:

```
<HTML>
<HEAD>
<TITLE>SSI Echo Command Example</TITLE>
</HEAD>
<BODY>
This is an example of the SSI echo command
<HR>
rain
<HR>
</BODY>
</HTML>
```

Display 8-bit and Multibyte Character Sets

Your Cisco IOS platform will automatically display 8-bit and multibyte character sets and print the ESC character as a single character instead of as the caret and bracket symbols (^[]) when the Cisco Web browser interface is enabled with the **ip http server** command. (Refer to the section “Configure the Cisco Web Browser Interface” for further information on configuring the Cisco Web browser interface.)

If you are Telnetting to a Cisco IOS platform, perform the following task in line configuration mode to display 8-bit and multibyte international character sets and print the ESC character as a single character instead of “^[]”:

Task	Command
Configure a router to display 8-bit and multibyte international character sets and print the ESC character as a single character instead of “^[]” when Telnetting to a Cisco IOS platform.	international

If you are Telnetting to a Cisco IOS platform, perform the following task in EXEC mode to display 8-bit and multibyte international characters sets and print the ESC character as a single character instead of “^[]” for the current Telnet session:

Task	Command
Configure a router to display 8-bit and multibyte international character sets and print the ESC character as a single character instead of “^[]” when Telnetting to a Cisco IOS platform for the current session.	terminal international
