Understanding the User Interface

This chapter describes the ATM switch router user interface and provides instructions for using the command-line interface (CLI).

Note This chapter provides advanced configuration instructions for the Catalyst 8540 MSR, Catalyst 8510 MSR, and LightStream 1010 ATM switch routers. For complete descriptions of the commands mentioned in this chapter, refer to the *ATM Switch Router Command Reference* publication.

The following sections are included:

- User Interface Overview on page 2-1
- Accessing Each Command Mode on page 2-2
- Additional Cisco IOS CLI Features on page 2-16

User Interface Overview

The user interface for the ATM switch router provides access to several different command modes, each with related commands. Users familiar with the Cisco IOS user interface will find the interfaces very similar. This chapter describes how to access and list the commands available in each command mode, and explains the primary uses for each command mode.

For security purposes, the user interface provides two levels of command access: *user* and *privileged*. The unprivileged user mode is called user EXEC mode; the privileged mode is called privileged EXEC mode, and requires a password.

Note Because all commands available in user EXEC mode are also available in privileged EXEC mode, user EXEC mode is referred to as EXEC mode in this guide.

From the privileged level, you can access global configuration mode; from global configuration mode you can access numerous submodes that allow you to configure specific, related features. Read-only memory (ROM) monitor mode accesses a basic system kernel to which the ATM switch router may default at startup if it does not find a valid system image, or if its configuration file is corrupted.

You can enter commands in uppercase, lowercase, or a mix of both. Only passwords are case sensitive. You can abbreviate commands and keywords to a minimum unique string of characters. 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.

Almost every configuration command has a **no** form. In general, use the **no** form to disable a feature or function. Use the command without the **no** keyword to reenable a disabled feature or enable a feature disabled by default.

Note   Refer to the *ATM Switch Router Command Reference* publication for the complete syntax of commands specific to the ATM switch router and a description of the function of the **no** form of a command. Refer to the *Configuration Fundamentals Command Reference* publication for the complete syntax of other IOS commands.

Accessing Each Command Mode

This section describes how to access the command modes for the ATM switch router. Table 2-1 and Table 2-2 list the command modes, access to each mode, the prompt you see while in that mode, the main uses for each configuration mode, and the method to exit that mode. The prompts listed assume the default ATM switch router name "Switch." Table 2-1 and Table 2-2 might not include all of the possible ways to access or exit each command mode.

Table 2-1   Summary of Command Modes

Command Mode	Access Method	Prompt	Exit Method
EXEC (user)	Log in to the ATM switch router.	`Switch>`	Use the **logout** command.
Privileged EXEC	From user EXEC mode, use the **enable** EXEC command and enter your password.	`Switch#`	To return to user EXEC mode, use the **disable** command.
ROM monitor	From privileged EXEC mode, use the **reload** EXEC command. Press **Break** during the first 60 seconds while the system boots.	`>`	To exit to user EXEC mode, type **continue**.
Global configuration	From privileged EXEC mode, use the **configure** privileged EXEC command. Use the keyword **terminal** to enter commands from your terminal.	`Switch(config)#`	To exit to privileged EXEC mode, use the **exit** or **end** command or press **Ctrl-Z**.
Interface configuration	From global configuration mode, specify an interface with an **interface** command.	`Switch(config-if)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.

Table 2-1   Summary of Command Modes (continued)

Command Mode	Access Method	Prompt	Exit Method
Subinterface configuration	From interface configuration mode, specify a subinterface with an **interface** command.	`Switch(config-subif)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
Line configuration	From global configuration mode, specify a line with a **line** command.	`Switch(config-line)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
Map-list configuration	From global configuration mode, define a map list with the **map-list** command.	`Switch(config-map-list)#`	To exit to global configuration mode, use the **exit** command. To enter map-class configuration mode, use the **map-class** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
Map-class configuration	From global configuration mode, configure a map class with the **map-class** command.	`Switch(config-map-class)#`	To exit to global configuration mode, use the **exit** command. To enter map-list configuration mode, use the **map-list** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
ATM router configuration	From global configuration mode, configure the PNNI routing protocol with the **atm router pnni** command.	`Switch(config-atm-router)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode use the **end** command or press **Ctrl-Z**.
PNNI node configuration	From ATM router configuration mode, configure the PNNI routing node with the **node** command.	`Switch(config-pnni-node)#`	To exit to ATM router configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.

Table 2-1   Summary of Command Modes (continued)

Command Mode	Access Method	Prompt	Exit Method
PNNI explicit path configuration	From global configuration mode, enter the **atm pnni explicit-path** command.	`Switch(cfg-pnni-expl-path)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
ATM accounting file configuration	From global configuration mode, define an ATM accounting file with the **atm accounting file** command.	`Switch(config-acct-file)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
ATM accounting selection configuration	From global configuration mode, define an ATM accounting selection table entry with the **atm accounting selection** command.	`Switch(config-acct-sel)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
LANE configuration server database configuration	From global configuration mode, specify a LANE configuration server database name with the **lane database** command.	`Switch(lane-config-database)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
ATM E.164 translation table configuration	From global configuration mode, enter the **atm e164 translation-table** command	`Switch(config-atm-e164)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
ATM signalling diagnostics configuration	From global configuration mode, enter the **atm signalling diagnostics** command and an index to configure.	`Switch(cfg-atmsig-diag)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
Controller configuration	From global configuration mode, enter the **controller** command.	`Switch(config-controller)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.

Table 2-2   Summary of Additional Command Modes (Catalyst 8540 MSR)

Command Mode	Access Method	Prompt	Exit Method
Redundancy configuration	From global configuration mode, enter the **redundancy** command.	`Switch(config-r)#`	To exit to global configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
Main CPU configuration	From redundancy configuration mode, enter the **main-cpu** command.	`Switch(config-r-mc)#`	To exit to redundancy configuration mode, use the **exit** command. To exit directly to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.

EXEC Mode

When you log in to the ATM switch router, you are in user EXEC, or simply 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-level EXEC commands allow you to connect to remote devices, change terminal settings on a temporary basis, perform basic tests, and list system information.

The user-level prompt consists of the ATM switch router's host name followed by the angle bracket (>):

```
Switch>
```

The default host name is *Switch*, unless it has been changed during using the **hostname** global configuration command.

Privileged EXEC Mode

The privileged EXEC command set includes all user-level EXEC mode commands and the **configure** command, through which you can access global configuration mode and the remaining configuration submodes. Privilege EXEC mode also includes high-level testing commands, such as **debug**, and commands that display potentially secure information.

To enter privileged EXEC mode from EXEC mode, use the **enable** command and enter your password; the prompt changes to the ATM switch router's host name followed by the pound sign (#):

```
Switch> enable
Password:
Switch#
```

To exit from privileged EXEC mode back to EXEC mode, use the **disable** command.

```
Switch# disable
Switch>
```

The system administrator uses the **enable password** global configuration command to set the password, which is case sensitive. If an enable password has not been set, privileged EXEC mode can only be accessed from the console.

ROM Monitor Mode

ROM monitor mode provides access to a basic system kernel, from which you can boot the ATM switch router or perform diagnostic tests. If a valid system image is not found, or if the configuration file is corrupted, the system might enter ROM monitor mode. The ROM monitor prompt is the angle bracket:

```
>
```

You can also enter ROM monitor mode by intentionally interrupting the boot sequence with the **Break** key during loading. For a description of this process, refer to the *Configuration Fundamentals Configuration Guide*.

To return to EXEC mode from ROM monitor mode, use the **continue** command:

```
> continue
Switch>
```

Global Configuration Mode

Global configuration mode provides access to commands that apply to the entire system. From global configuration mode you can also enter the other configuration modes described in the following subsections.

To enter global configuration mode from privileged EXEC mode, enter the **configure** command and specify the source of the configuration commands at the prompt; the prompt changes to the ATM switch router's hostname followed by (config)#:

```
Switch# configure
Configuring from terminal, memory, or network [terminal]? <CR>
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#
```

You can specify either the terminal, nonvolatile memory (NVRAM), or a file stored on a network server as the source of configuration commands. For more information, see Chapter 22, "Managing Configuration Files, System Images, and Functional Images." The default is to enter commands from the terminal console.

As a shortcut for accessing the terminal method of configuration, enter the following:

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

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

```
Switch(config)# end
Switch#
```

Interface Configuration Mode

Interface configuration mode provides access to commands that apply on a per-interface basis. These commands modify the operation of an interface such as an ATM, Ethernet, or asynchronous port.

To enter interface configuration mode from global configuration mode, use the **interface** command with a keyword indicating the interface type, followed by an interface number; the prompt changes to the ATM switch router's hostname followed by (config-if)#:

```
Switch(config)# interface atm 3/0/0
Switch(config-if)#
```

To exit interface configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-if)# exit
Switch(config)#
```

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

```
Switch(config-if)# end
Switch#
```

Interface Addressing Formats (Catalyst 8540)

In the ATM switch router chassis, you specify interfaces in slots 0 through 3 and 9 through 12 using the *card/subcard/port* format. Slots 4 and 8 each contain a CPU (multiservice route processor). Because the configurations on the primary and secondary route processors are automatically synchronized, they are configured via a single network interface, specified as **atm0** or **ethernet0**. There is no need to configure the secondary separately from the primary, but some show commands allow you to display information about the secondary route processor; in these cases, you specify the interface as **atm-sec0** or **ethernet-sec0**. Slots 5 through 7 contain the switch processors, which have no interfaces. Table 2-3 summarizes this addressing scheme, assuming that slot 4 is the primary route processor and slot 8 is the secondary route processor.

Table 2-3   Interface Addressing Formats (Catalyst 8540)

Slot	Addressing Format
0	*card/subcard/port*
1	*card/subcard/port*
2	*card/subcard/port*
3	*card/subcard/port*
4	**atm0** or **ethernet0**
5	-
6	-
7	-
8	**atm-sec0** or **ethernet-sec0**
9	*card/subcard/port*
10	*card/subcard/port*
11	*card/subcard/port*
12	*card/subcard/port*

The following example shows how to enter interface configuration mode to configure the Ethernet interface on the CPU:

```
Switch(config)# interface ethernet0
Switch(config-if)#
```

CPU Interface Address Format (Catalyst 8510 MSR and LightStream 1010)

With this release of the ATM switch router software, addressing the interface on the processor (CPU) has changed. The ATM interface is now called atm0, and the Ethernet interface is now called ethernet0.

The following example shows how to enter interface configuration mode to configure the Ethernet interface on the processor:

```
Switch(config)# interface ethernet0
Switch(config-if)#
```

Note   The old formats (atm 2/0/0 and ethernet 2/0/0) are still supported in this release.

Subinterface Configuration Mode

Subinterface configuration mode allows access to commands that affect logical interfaces, also called subinterfaces. Subinterfaces are used, for example, to configure multiple VP tunnels on a single interface.

To enter subinterface configuration command mode from global configuration or interface configuration mode, use the **interface** command with a keyword indicating the interface type, followed by an interface and subinterface number; the prompt changes to the ATM switch router's hostname followed by (config-subif)#:

```
Switch(config)# interface atm 0/0/0.99
Switch(config-subif)#
```

To exit subinterface configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-subif)# exit
Switch(config)#
```

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

```
Switch(config-subif)# end
Switch#
```

Line Configuration Mode (Catalyst 8540 MSR)

Line configuration mode on the Catalyst 8540 MSR provides access to commands that modify the operation of individual terminal lines. These commands are used to configure the console, and vty connections, set up modem connections, and so on.

To enter line configuration mode from global configuration mode, use the **line** command followed by a line type (**console** or **vty**) and a line number or range; the prompt changes to the ATM switch router's hostname followed by (config-line)#:

```
Switch(config)# line vty 0
Switch(config-line)#
```

For detailed line configuration instructions, refer to the *Configuration Fundamentals Configuration Guide*.

To exit line configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-line)# exit
Switch(config)#
```

To exit line configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-line)# end
Switch#
```

Line Configuration Mode (Catalyst 8510 MSR and LightStream 1010)

Line configuration mode on the Catalyst 8510 MSR and LightStream 1010 ATM switch router provides access to commands that modify the operation of individual terminal lines. These commands are used to configure the console, auxiliary, and vty connections, set up modem connections, and so on.

To enter line configuration mode from global configuration mode, use the **line** command followed by a line type (**aux**, **console**, or **vty**) and a line number or range; the prompt changes to the ATM switch router's hostname followed by (config-line)#:

```
Switch(config)# line vty 0
Switch(config-line)#
```

For detailed line configuration instructions, refer to the *Configuration Fundamentals Configuration Guide*.

To exit line configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-line)# exit
Switch(config)#
```

To exit line configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-line)# end
Switch#
```

Map-List Configuration Mode

Map-list configuration mode provides access to commands used to statically map protocol addresses of remote hosts or switches to permanent virtual connections (PVCs) or switched virtual connections (SVCs).

To enter map-list configuration mode from global configuration mode, use the **map-list** command followed by a map-list name to configure; the prompt changes to the ATM switch router's hostname followed by (config-map-list)#:

```
Switch(config)# map-list newlist
Switch(config-map-list)#
```

You can also use the **map-list** command to enter map-list configuration mode directly from map-class configuration mode, without first returning to global configuration mode:

```
Switch(config-map-class)# map-list newlist
Switch(config-map-list)#
```

To exit map-list configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-map-list)# exit
Switch(config)#
```

To exit map-list configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-map-list)# end
Switch#
```

Map-Class Configuration Mode

Map-class configuration mode provides access to command used to define the traffic parameters when specifying a request for a switched virtual channel (SVC).

To enter map-class configuration mode from global configuration mode, enter the **map-class** command followed by a class name to configure; the prompt changes to the ATM switch router's hostname followed by (config-map-class)#:

```
Switch(config)# map-class atm newclass
Switch(config-map-class)#
```

You can also use the **map-class** command to enter map-class configuration mode directly from map-list configuration mode, without first returning to global configuration mode:

```
Switch(config-map-list)# map-class atm newclass
Switch(config-map-class)#
```

To exit map-class configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-map-class)# exit
Switch(config)#
```

To exit map-class configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-map-class)# end
Switch#
```

ATM Router Configuration Mode

ATM router configuration mode provides access to commands used to configure Private Network-Network Interface (PNNI) routing.

To enter ATM router configuration mode from global configuration mode, use the **atm router pnni** command; the prompt changes to the ATM switch router's hostname followed by (config-atm-router)#:

```
Switch(config)# atm router pnni
Switch(config-atm-router)#
```

To exit ATM router configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-atm-router)# exit
Switch(config)#
```

To exit ATM router configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-atm-router)# end
Switch#
```

For detailed information on configuring PNNI routing, refer to Chapter 10, "Configuring ATM Routing and PNNI."

PNNI Node Configuration Mode

The PNNI node configuration mode is a submode of ATM router configuration mode and provides access to commands you use to configure PNNI nodes on the ATM switch router.

To enter PNNI node configuration mode from ATM router configuration mode, use the **node** command followed by a node index; the prompt changes to the ATM switch router's hostname followed by (config-pnni-node)#:

```
Switch(config-atm-router)# node 1
Switch(config-pnni-node)#
```

To exit PNNI node configuration mode and return to ATM router configuration mode, use the **exit** command:

```
Switch(config-pnni-node)# exit
Switch(config-atm-router)#
```

To exit PNNI node configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-pnni-node)# end
Switch#
```

For detailed information on configuring PNNI nodes, refer to Chapter 10, "Configuring ATM Routing and PNNI."

PNNI Explicit Path Configuration Mode

The PNNI explicit path configuration mode provides access to commands used to manually configure fully specified or partially specified paths for routing soft permanent virtual channel (soft PVC) and soft permanent virtual path (soft PVP) connections.

To enter the PNNI explicit path configuration mode from global configuration mode, use the **atm pnni explicit-path** command followed by an explicit path name or path-id number; the prompt changes to the ATM switch router's hostname followed by (cfg-pnni-expl-path)#:

```
Switch(config)# atm pnni explicit-path name newexplicit-path
Switch(cfg-pnni-expl-path)#
```

To exit PNNI explicit path configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(cfg-pnni-expl-path)# exit
Switch(config)#
```

To exit PNNI explicit path configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(cfg-pnni-expl-path)# end
Switch#
```

For detailed information on configuring PNNI explicit paths, refer to Chapter 10, "Configuring ATM Routing and PNNI."

ATM Accounting File Configuration Mode

ATM accounting file configuration mode provides access to commands used to configure a file for accounting and billing of virtual circuits (VCs).

To enter ATM accounting file configuration mode from global configuration mode, use the **atm accounting file** command followed by an accounting filename; the prompt changes to the ATM switch router hostname followed by (config-acct-file)#:

```
Switch(config)# atm accounting file acctng_file1
Switch(config-acct-file)#
```

To exit ATM accounting file configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-acct-file)# exit
Switch(config)#
```

To exit ATM accounting file configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-acct-file)# end
Switch#
```

For detailed information on configuring ATM accounting, refer to Chapter 14, "Configuring ATM Accounting and ATM RMON."

ATM Accounting Selection Configuration Mode

ATM accounting selection configuration mode provides access to commands used to specify the connection data to be gathered from the ATM switch router.

To enter ATM accounting selection configuration mode, use the **atm accounting selection** command and specify an accounting selection index; the prompt changes to the ATM switch router's hostname followed by (config-acct-sel)#:

```
Switch(config)# atm accounting selection 1
Switch(config-acct-sel)#
```

To exit ATM accounting selection configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-acct-sel)# exit
Switch(config)#
```

To exit ATM accounting selection configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-acct-sel)# end
Switch#
```

For detailed information on configuring ATM accounting selections, refer to Chapter 14, "Configuring ATM Accounting and ATM RMON."

LANE Configuration Server Database Configuration Mode

LAN emulation (LANE) configuration server database configuration mode provides access to commands used to define the LANE configuration server database.

To enter LANE configuration server database configuration mode from global configuration mode, use the **lane database** command and specify a database name; the prompt changes to the ATM switch router's hostname followed by (lane-config-database)#:

```
Switch(config)# lane database lecsdb
Switch(lane-config-database)#
```

To exit LANE configuration server database configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(lane-config-database)# exit
Switch(config)#
```

To exit LANE configuration server database configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(lane-config-database)# end
Switch#
```

For detailed information on configuring the LAN emulation configuration server database, refer to Chapter 13, "Configuring LAN Emulation."

ATM E.164 Translation Table Configuration Mode

ATM E.164 translation table configuration mode provides access to commands used to configure the translation table that maps native E.164 format addresses to ATM end system (AESA) format addresses.

To enter ATM E.164 translation table configuration mode from global configuration mode, use the **atm e164 translation-table** command; the prompt changes to the ATM switch router's hostname followed by (config-atm-e164)#:

```
Switch(config)# atm e164 translation-table
Switch(config-atm-e164)
```

To exit ATM E.164 translation table configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-atm-e164)# exit
Switch(config)#
```

To exit ATM E.164 translation table configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-atm-e164)# end
Switch#
```

For detailed information on configuring E.164 addresses, refer to the "Configuring E.164 Addresses" section on page 16-4.

ATM Signalling Diagnostics Configuration Mode

ATM signalling diagnostics configuration mode provides access to commands used to configure the signalling diagnostics table.

To enter ATM signalling diagnostics configuration mode from global configuration mode, use the **atm signalling diagnostics** command and specify an index for the filter table; the prompt changes to the ATM switch router's hostname followed by (cfg-atmsig-diag):

```
Switch(config)# atm signalling diagnostics 1
Switch(cfg-atmsig-diag)
```

To exit ATM signalling diagnostics configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(cfg-atmsig-diag)# exit
Switch(config)#
```

To exit ATM signalling diagnostics configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(cfg-atmsig-diag)# end
Switch#
```

For detailed information on configuring signalling diagnostics, refer to the "Configuring Signalling Diagnostics Tables" section on page 16-12.

Controller Configuration Mode

Controller configuration mode provides access to commands used to configure physical and logical parameters of a channelized interface.

To enter ATM controller configuration mode from global configuration mode, use the **controller** command with a channel type and interface:

```
Switch(config)# controller e1 1/0/0
Switch(config-controller)#
```

To exit ATM controller configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-controller)# exit
Switch(config)#
```

To exit ATM controller configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-controller)# end
Switch#
```

For detailed information on configuring channel groups on a Frame Relay/FUNI interface, refer to Chapter 19, "Configuring Frame Relay to ATM Interworking Port Adapter Interfaces."

Redundancy Configuration Mode (Catalyst 8540 MSR)

Redundancy configuration mode provides access to commands used to configure system redundancy and EHSA operation.

To enter redundancy configuration mode from global configuration mode, use the **redundancy** command; the prompt changes to the ATM switch router's hostname followed by (config-r):

```
Switch(config)# redundancy
Switch(config-r)#
```

To exit ATM redundancy configuration mode and return to global configuration mode, use the **exit** command:

```
Switch(config-r)# exit
Switch(config)#
```

To exit ATM redundancy configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-r)# end
Switch#
```

For detailed information on configuring system redundancy, refer to the "Configuring Redundancy and Enhanced High System Availability (Catalyst 8540 MSR)" section on page 3-23.

Main CPU Configuration Mode (Catalyst 8540 MSR)

Main CPU configuration mode provides access to commands used to synchronize the configuration of the primary and secondary route processors.

To enter main CPU configuration mode from redundancy configuration mode, use the **main-cpu** command; the prompt changes to the ATM switch router's hostname followed by (config-r-mc):

```
Switch(config-r)# main-cpu
Switch(config-r-mc)#
```

To exit ATM main CPU configuration mode and return to redundancy configuration mode, use the **exit** command:

```
Switch(config-r-mc)# exit
Switch(config-r)#
```

To exit ATM main cpu configuration mode and return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**:

```
Switch(config-r-mc)# end
Switch#
```

For detailed information on synchronizing configurations, refer to the "Configuring Redundancy and Enhanced High System Availability (Catalyst 8540 MSR)" section on page 3-23.

Additional Cisco IOS CLI Features

Because the ATM switch router's operating system is based on Cisco IOS software, its interface provides a number of features that help you use the CLI with greater flexibility, ease, and power. These features includes the following:

- Context-sensitive help—allows you to obtain a list of commands available for each command mode or a list of available options for a specific command by entering a question mark (**?**).

- Command history—records a history of commands, allowing you to recall previously entered long or complex commands.

- Editing—provides the ability to move around the command line, cut and paste entries, control scrolling, create keyboard macros, and so on.

For information on using these and other features of Cisco IOS software, refer to the *Configuration Fundamentals Configuration Guide*.