IOS and Configuration Basics

This appendix contains basic information about the Cisco Internet Operating System (IOS) software and includes the following sections:

- Cisco IOS Modes of Operation
- Getting Context-Sensitive Help
- Saving Configuration Changes

Cisco IOS Modes of Operation

Cisco IOS software provides access to several different command modes. Each command mode provides a different group of related commands.

For security purposes, Cisco IOS software provides two levels of access to commands: user and privileged. The unprivileged user mode is called user EXEC mode. The privileged mode is called privileged EXEC mode and requires a password. The commands available in user EXEC mode are a subset of the commands available in privileged EXEC mode.

Table C-1 describes some of the most commonly used modes, how to enter the modes, and the resulting prompts. The prompt helps you identify which mode you are in and, therefore, which commands are available to you.

Table C-1 Cisco IOS Operating Modes

Mode of Operation	Usage	How to Enter the Mode	Prompt
User EXEC	User EXEC commands allow you to connect to remote devices, change terminal settings on a temporary basis, perform basic tests, and list system information. The EXEC commands available at the user level are a subset of those available at the privileged level.	Log in.	MGX8850-RPM>
Privileged EXEC	Privileged EXEC commands set operating parameters. The privileged command set includes those commands contained in user EXEC mode, and also the **configure** command through which you can access the remaining command modes. Privileged EXEC mode also includes high-level testing commands, such as **debug**.	Enter the **enable** EXEC command from user EXEC mode.	MGX8850-RPM#
Global configuration	Global configuration commands apply to features that affect the system as a whole.	Enter the **configure** privileged EXEC command from global configuration mode.	MGX8850-RPM(config)#
Interface configuration	Interface configuration commands modify the operation of an interface such as an Ethernet or serial port. Many features are enabled on a per-interface basis. Interface configuration commands always follow an interface global configuration command, which defines the interface type.	Enter the **interface** *type number* command from global configuration mode. For example, enter the **interface int switch 9/1** command to configure the ATM interface.	MGX8850-RPM(config-if)#
ROM monitor	ROM monitor commands are used to perform low-level diagnostics. You can also use the ROM monitor commands to recover from a system failure and stop the boot process in a specific operating environment.[1]	Enter the **reload** EXEC command from privileged EXEC mode. Click **BREAK** during the first 60 seconds while the system is booting.	ROMMON>

1. You can modify the configuration register value using the **config-reg** configuration command. See Appendix A, "Maintaining the MGX RPM" the "Virtual Configuration Register Settings" section for more information.

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, enter the **no ip routing** command and enter **ip routing** to reenable it. The Cisco IOS software command reference publication provides the complete syntax for the configuration commands and describes what the **no** form of a command does.

Getting Context-Sensitive Help

In any command mode, you can list the available commands by entering a question mark (**?**).

```
MGX8850-RPM> ?
```

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.

```
MGX8850-RPM# co?
configure  connect  copy
```

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

```
MGX8850-RPM# configure ?
  memory    Configure from NV memory
  network   Configure from a TFTP network host
  terminal  Configure from the terminal
  <cr>
```

You can also abbreviate commands and keywords by entering just enough characters to make the command unique from other commands. For example, you can abbreviate the **show** command to **sh**.

Saving Configuration Changes

Whenever you make changes to the RPM configuration, you must save the changes to memory so they will not be lost if the system is rebooted. There are two types of configuration files: the running (current operating) configuration and the startup configuration. The running configuration is stored in RAM; the startup configuration is stored in NVRAM.

To display the current running configuration, enter the **show running-config** command. Enter the **copy running-config startup-config** command to save the current running configuration to the startup configuration file in NVRAM.

```
MGX8850-RPM> enable
MGX8850-RPM# copy running-config startup-config
```

To display the startup configuration, enter the **show startup-config** command. Enter the **copy startup-config running-config** command to write the startup configuration to the running configuration.

```
MGX8850-RPM> enable
MGX8850-RPM# copy startup-config running-config
```

To erase both configuration files (and start over), enter the **write erase** and **reload** commands:

```
MGX8850-RPM> enable
MGX8850-RPM# write erase
MGX8850-RPM# reload
```

Warning **This command sequence will erase the entire RPM configuration in RAM and NVRAM and reload the RPM.**

Manually Configuring RPM

You can configure the RPM manually if you prefer not to use **AutoInstall** or the prompt-driven System Configuration Dialog.

Take the following steps to configure the RPM manually:

Step 1 Connect a console terminal to the RPM.

Follow the instructions described in Chapter 3, "Installing the MGX RPM," in the section "Connecting a Console Terminal or PC to the RPM Console Port," and then power on the RPM.

Step 2 When you are prompted to enter the initial dialog, enter **no** to go into the normal operating mode of the RPM:

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

Step 3 After a few seconds you will see the user EXEC prompt (Router>).

By default, the host name is Router, but the prompt will match the current host name. In the following examples, the host name is MGX8850-RPM. Enter the **enable** command to enter enable mode. You can make configuration changes only in enable mode:

```
MGX8850-RPM> enable
```

The prompt will change to the privileged EXEC (enable) prompt, MGX8850-RPM#.

Step 4 Enter the **configure terminal** command at the enable prompt to enter configuration mode:

```
MGX8850-RPM# config terminal
```

You can now enter any changes you want to the configuration. You will probably want to perform the following tasks:

1. Assign a host name for the RPM using the **hostname** command.
2. Enter an enable secret using the **enable secret** command.
3. Enter an enable password using the **enable password** command.
4. Assign addresses to the interfaces using the **protocol address** command.
5. Specify which protocols to support on the interfaces.

Refer to the Cisco IOS configuration and command reference publications for more information about the commands you can use to configure the RPM. You can also refer to the *MGX 8850 Wide Area Switch Command Reference* and *MGX 8850 Wide Area Switch Installation and Configuration* documents for information about the commands you can use to configure the RPM.

Step 5 When you finish configuring the RPM, enter the **exit** command until you return to the privileged EXEC prompt (MGX8850-RPM#).

Step 6 To save the configuration changes to NVRAM, enter the **copy run start** command at the privileged EXEC prompt:

```
MGX8850-RPM# copy run start
********
```

The RPM is now configured and will boot with the configuration you entered.

This concludes the initial RPM configuration.

Verifying Network Connectivity

When you have installed and configured the RPM, you can use the following commands in user EXEC mode to verify network connectivity:

- **ping**—Sends a special datagram to the destination device, then waits for a reply datagram from that device
  See "Verifying Network Connectivity" of Chapter 5 in this manual for a detailed **ping** procedure.
- **telnet**—Logs in to a remote node
- **traceroute**—Discovers the routes that packets take when traveling from one RPM to another

If there is a problem with network connectivity, see Appendix A, "Maintaining the MGX RPM" in the section "Reading Front Panel LEDs," and check the cable connections. If there is still a problem, check the RPM configuration. Contact customer service for further assistance.