C H A P T E R 1

Using the WAAS Command-Line Interface

The Cisco WAAS software command-line interface (CLI) is used in combination with the WAAS Manager GUI to configure, monitor, and maintain a WAAS device. The CLI on a WAAS device can be accessed directly through the console port of an attached PC or remotely through a Telnet session on a PC running terminal emulation software.

Note The WAAS software runs on the WAE-511, WAE-512, WAE-611, WAE-612, WAE-7326. WAE-7341, and WAE-7371. You must deploy the WAAS Central Manager on a dedicated appliance.

Throughout this book, the term WAE is used to refer collectively to the supported WAE platforms unless otherwise noted. For simplification, the term WAAS device is used to refer collectively to WAAS Central Managers and WAEs that are running the WAAS software.

This chapter provides an overview of how to use the WAAS CLI, including an explanation of CLI command modes, navigation and editing features, and help features.

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Using Command Modes

The CLI for WAAS software is similar to the CLI for Cisco IOS software. Like Cisco IOS software, the WAAS CLI is organized into different command and configuration modes. Each mode provides access to a specific set of commands. This section describes the command modes provided by the WAAS software CLI and includes the following topics:

Organization of the WAAS CLI

The WAAS software CLI is organized into multiple command modes. Each command mode has its own set of commands to use for the configuration, maintenance, and monitoring of a WAAS WAE. The commands available to you at any given time depend on the mode you are in. Entering a question mark (?) at the system prompt allows you to obtain a list of commands available for each command mode.

The WAAS command modes include the following:

- EXEC mode—For setting, viewing, and testing system operations. This mode is divided into two access levels: user and privileged. To use the privileged access level, enter the **enable** command at the user access level prompt, and then enter the privileged EXEC password when you see the password prompt.

- Global configuration mode—For setting, viewing, and testing configuration of WAAS software features for the entire device. To use this mode, enter the **configure** command from privileged EXEC mode.

- Interface configuration mode—For setting, viewing, and testing the configuration of a specific interface. To use this mode, enter the **interface** command from global configuration mode.

- Standard ACL configuration mode—For creating and modifying standard access lists on a WAAS device for controlling access to interfaces or applications. To use this mode, enter the **ip access-list standard** command from global configuration mode.

- Extended ACL configuration mode—For creating and modifying extended access lists on a WAAS device for controlling access to interfaces or applications. To use this mode, enter the **ip access-list extended** command.

Use specific commands to navigate from one command mode to another. Use this standard order to access the modes: user EXEC mode, privileged EXEC mode, global configuration mode, interface configuration mode, standard ACL configuration mode, or extended ACL configuration mode.

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Using EXEC Mode

Use the EXEC mode for setting, viewing, and testing system operations. In general, the user EXEC commands allow you to connect to remote devices, change terminal line settings on a temporary basis, perform basic tests, and list system information.

The EXEC mode is divided into two access levels: user and privileged. The user EXEC mode is used by local and general system administrators, while the privileged EXEC mode is used by the root administrator. Use the **enable** and **disable** commands to switch between the two levels. Access to the user-level EXEC command line requires a valid password. The user-level EXEC commands are a subset of the privileged-level EXEC commands. The user-level EXEC prompt is the hostname followed by a right angle bracket (>). You can change the hostname using the **hostname** global configuration command. The prompt for the privileged-level EXEC command line is the pound sign (#). To execute an EXEC command, enter the command at the EXEC system prompt and press the **Return** key. In the following example, a user accesses the privileged-level EXEC command line from the user level:

```
WAE> enable
WAE#
```

Use the **Delete** or **Backspace** key sequences to edit commands when you enter commands at the EXEC prompt.

Most EXEC mode commands are one-time commands, such as **show** or **more** commands, which show the current configuration status, and **clear** commands, which clear counters or interfaces. EXEC mode commands are not saved across reboots of the WAE.

As a shortcut, you can abbreviate commands to the fewest letters that make them unique. For example, the letters **sho** can be entered for the **show** command.

Certain EXEC commands display multiple screens with the following prompt at the bottom of the screen:

```
--More--
```

Press the **Spacebar** to continue the output, or press **Return** to display the next line. Press any other key to return to the prompt. Also, at the --More-- prompt, you can enter a **?** to display the help message.

To leave EXEC mode, use the **exit** command at the system prompt:

```
WAE# exit
WAE>
```

The EXEC commands are entered in EXEC mode.

Using Global Configuration Mode

Use global configuration mode for setting, viewing, and testing configuration of WAAS software features for the entire device. To enter this mode, enter the **configure** command from privileged EXEC mode. The prompt for global configuration mode consists of the hostname of the WAE followed by (config) and the pound sign (#). You must be in global configuration mode to enter global configuration commands.

```
WAE# configure
WAE(config)#
```

Commands entered in global configuration mode update the running configuration file as soon as they are entered. These changes are not saved into the startup configuration file until you enter the **copy running-config startup-config** EXEC mode command. See the . Once the configuration is saved, it is maintained across WAE reboots.

You also can use global configuration mode to enter specific configuration modes. From global configuration mode you can enter the interface configuration mode, standard ACL configuration mode, or the extended ACL configuration mode.

From configuration modes, you can enter configuration submodes. Configuration submodes are used for the configuration of specific features within the scope of a given configuration mode. As an example, this chapter describes the subinterface configuration mode, a submode of the interface configuration mode.

To exit global configuration mode, use the **end** global configuration command:

```
WAE(config)# end
WAE#
```

You can also exit global configuration mode by entering the **exit** command or by pressing **Ctrl-Z**.

Global configuration commands are entered in global configuration mode.

Configuration changes that you make in global configuration mode on a WAE are propagated to the Centralized Management System (CMS) database on the WAAS Central Manager. CLI changes are sent to the Central Manager after you exit out of configuration mode, or if all configuration mode sessions have been inactive for 10 minutes.

Using the Interface Configuration Mode

Use the interface configuration mode for setting, viewing, and testing the configuration of WAAS software features on a specific interface. To enter this mode, enter the **interface** command from the global configuration mode. The following example demonstrates how to enter interface configuration mode:

```
WAE# configure
WAE(config)# interface ?
  GigabitEthernet  Select a gigabit ethernet interface to configure
  InlineGroup      Select an inline group interface to configure
  InlinePort       Select an inline port interface to configure
  PortChannel      Ethernet Channel of interfaces
  Standby          Standby groups
WAE(config)# interface gigabitethernet ?
   <1-2>/ GigabitEthernet slot/port
WAE(config)# interface gigabitethernet 1/0
WAE(config-if)#
```

To exit interface configuration mode, enter **exit** to return to global configuration mode:

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

The interface configuration commands are entered in interface configuration mode.

Using ACL Configuration Modes

From global configuration mode, you can enter the standard and extended ACL configuration modes.

- To work with a standard access list, enter the **ip access-list standard** command from the global configuration mode prompt. The CLI enters a configuration mode in which all subsequent commands apply to the current access list.

- To work with an extended access list, enter the **ip access-list extended** command from the global configuration mode prompt. The CLI enters a configuration mode in which all subsequent commands apply to the current access list.

To exit an ACL configuration mode, enter **exit** to return to global configuration mode:

```
WAE(config-std-nacl)# exit
WAE(config)#
```

To return to global configuration mode, enter the **exit** command.

Command Modes Summary

Table 1-1 shows a summary of the WAAS command modes.

Table 1-1   WAAS Command Modes Summary

Command Mode	Access Method	Prompt	Exit Method
User EXEC	Log in to WAE.	`WAE>`	Use the **end** command.
Privileged EXEC	From user EXEC mode, use the **enable** EXEC command.	`WAE#`	To return to user EXEC mode, use the **disable** command. To enter global configuration mode, use the **configure** command.
Global configuration	From privileged EXEC mode, use the **configure** command.	`WAE(config)#`	To return to privileged EXEC mode, use the **exit** command or press **Ctrl-Z**. To enter interface configuration mode, use the **interface** command.
Interface configuration	From global configuration mode, use the **interface** command.	`WAE(config-if)#`	To return to global configuration mode, use the **exit** command. To return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
Standard ACL configuration	From global configuration mode, use the **ip access-list standard** command.	`WAE(config-std-nacl)#`	To return to global configuration mode, use the **exit** command. To return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.
Extended ACL configuration	From global configuration mode, use the **ip access-list extended** command.	`WAE(config-ext-nacl)#`	To return to global configuration mode, use the **exit** command. To return to privileged EXEC mode, use the **end** command or press **Ctrl-Z**.

Device Mode

The WAAS software provides the ability to specify the device mode of a WAAS device. In a WAAS network, you must deploy a WAAS device in one of the following device modes:

- Central Manager mode—Mode that the WAAS Central Manager device needs to use.

- Application accelerator mode—Mode for a WAAS Accelerator (that is a Core WAE or Edge WAE) that is running the WAAS software. WAEs are used to optimize TCP traffic over your network. When client and server applications attempt to communicate with each other, the network intercepts and redirects this traffic to the WAEs so that they can act on behalf of the client application and the destination server. The WAEs examine the traffic and use built-in application policies to determine whether to optimize the traffic or allow it to pass through your network unoptimized.

The default device mode for a WAAS device is application accelerator mode. The **device mode** global configuration command allows you to change the device mode of a WAAS device.

```
waas-cm(config)# device mode ?
  application-accelerator  Configure device to function as a WAAS Engine.
  central-manager          Configure device to function as a WAAS Central Manager.
```

For example, after you use the WAAS CLI to specify the basic network parameters for the designated WAAS Central Manager (the WAAS device named waas-cm) and assign it as a primary interface, you can use the **device mode** configuration command to specify its device mode as central-manager.

```
waas-cm# configure
waas-cm(config)#
waas-cm(config)# primary-interface gigabitEthernet 1/0
waas-cm(config)# device mode central-manager
waas-cm(config)# exit
waas-cm# copy run start
waas-cm# reload
Proceed with reload?[confirm] y
Shutting down all services, will Reload requested by CLI@ttyS0.
Restarting system.
```

To display the current mode that the WAAS device is operating in, enter the **show device-mode current** EXEC command:

```
WAE# show device-mode current
Current device mode: application-accelerator
```

To display the configured device mode that has not taken effect, enter the **show device-mode configured** EXEC command. For example, if you had entered the **device mode central-manager** global configuration command on a WAAS device to change its device mode to central manager but have not entered the **copy run start EXEC** command to save the running configuration on the device, then if you were to enter the **show device-mode configured** command on the WAAS device, the command output would indicate that the configured device mode is central-manager:

```
WAE# show device-mode configured
Configured device mode: central-manager
```

Because WAAS Central Manager must be deployed on a dedicated appliance, a WAAS device can operate only in one device mode: either in central-manager mode or application-accelerator mode.

The set of WAAS CLI commands that are available vary based on the device mode of the WAAS device.

Using Command-Line Processing

Cisco WAAS software commands are not case sensitive. You can abbreviate commands and parameters as long as they contain enough letters to be different from any other currently available commands or parameters.

You can also scroll through the last 20 commands stored in the history buffer and enter or edit the command at the prompt. Table 1-2 lists and describes the function performed by the available WAAS command-line processing options.

Table 1-2   Command-Line Processing Keystroke Combinations

Keystroke Combinations	Function
Ctrl-A	Jumps to the first character of the command line.
Ctrl-B or the Left Arrow key	Moves the cursor back one character.
Ctrl-C	Escapes and terminates prompts and tasks.
Ctrl-D	Deletes the character at the cursor.
Ctrl-E	Jumps to the end of the current command line.
Ctrl-F or the Right Arrow key[1]	Moves the cursor forward one character.
Ctrl-K	Deletes from the cursor to the end of the command line.
Ctrl-L	Repeats the current command line on a new line.
Ctrl-N or the Down Arrow key[1]	Enters the next command line in the history buffer.
Ctrl-P or the Up Arrow key[1]	Enters the previous command line in the history buffer.
Ctrl-T	Transposes the character at the cursor with the character to the left of the cursor.
Ctrl-U; Ctrl-X	Deletes from the cursor to the beginning of the command line.
Ctrl-W	Deletes the last word typed.
Esc-B	Moves the cursor back one word.
Esc-D	Deletes from the cursor to the end of the word.
Esc-F	Moves the cursor forward one word.
Delete key or Backspace key	Erases a mistake when entering a command; re-enter the command after using this key.

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

Checking 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.

```
WAE# clock 1222
               ^
%Invalid input detected at '^' marker.
```

```
WAE# clock ?
    read-calendar    Read the calendar and update system clock
    set              Set the time and date
    update-calendar  Update the calendar with system clock
```

The help output shows that the **set** keyword is required.

Check the syntax for entering the time.

```
WAE# clock set ?
    <0-23>:  Current Time (hh:mm:ss)
```

Enter the current time in 24-hour format with hours, minutes, and seconds separated by colons.

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

The system indicates that you need to provide additional arguments to complete the command. Press the **Up Arrow** to automatically repeat the previous command entry, and then add a space and question mark (?) to display the additional arguments.

```
WAE# clock set 13:32:00 ?
    <1-31> Day of the month
    april
    august
    december
    february
    january    Month of the Year
    july
    june
    march
    may
    november
    october
    september
```

Enter the day and month as prompted, and use the question mark for additional instructions.

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

Now you can complete the command entry by entering the year.

```
WAE# clock set 13:32:00 23 December 05
                                        ^
%Invalid input detected at '^' marker.
WAE#
```

The caret symbol (^) and help response indicate an error with the 05 entry. To display the correct syntax, press **Ctrl-P** or the **Up Arrow**. You can also re-enter the command string, and then enter a space character, a question mark, and press **Enter**.

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

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

```
WAE# clock set 13:32:00 23 December 2005
WARNING: Setting the clock may cause a temporary service interruption.
Do you want to proceed? [no] yes
Sat Dec 23 13:32:00 EST 2005
WAE#
```

Using the no Form of Commands

Almost every configuration command has a no form. The **no** form of a command is generally used to disable a feature or function, but it can also be used to set the feature or function to its default values. Use the command without the **no** keyword to reenable a disabled feature or to enable a feature that is disabled by default.

Using System Help

You can obtain help when you enter commands by using the following methods:

- For a brief description of the context-sensitive help system, enter **help**.

- To list all commands for a command mode, enter a question mark (**?**) at the system prompt.

- To obtain a list of commands that start with a particular character set, enter an abbreviated command immediately followed by a question mark (**?**).

  ```
  WAE# cl?
      clear clock
  ```

- To list the command keywords or arguments, enter a space and a question mark (**?**) after the command.

  ```
  WAE# clock ?
      read-calendar     Read the calendar and update system clock
      set               Set the time and date
      update-calendar   Update the calendar with system clock
  ```

Saving Configuration Changes

To avoid losing new configurations, save them to NVRAM using the **copy** or **write** commands, as shown in the following example:

```
WAE# copy running-config startup-config
```

or

```
WAE# write
```

See the **copy running-config startup-config** and **write** commands for more information about running and saved configuration modes.

Navigating the WAAS Directories on a WAE

The WAAS CLI provides several commands for navigating among directories and viewing their contents. These commands are entered from privileged EXEC mode. Table 1-3 lists and describes these commands.

Table 1-3   WAAS Navigation Commands

Command	Description
cd [*directory-name*]	Change Directory—Moves you from the current directory to the specified directory in the WAAS tree. If no directory is specified, **cd** takes you up one directory.
deltree *directory-name*	Remove Directory Tree—Deletes the specified directory and all subdirectories and files without displaying a warning message to you.
dir [*directory-name*]	Show Directory—Lists the size, date of last changes, and the name of the specified directory (or all directories if one is not specified) within the current directory path. The output from this command is the same as the **lls** command.
ls [*directory-name*]	Show Directory Names—Lists the names of directories in the current directory path.
lls [*directory-name*]	Show Directory—Lists the size, the date of the last changes, and the name of the specified directory (or all directories if one is not specified) within the current directory path. The output from this command is the same as the **dir** command.
mkdir *directory-name*	Create Directory—Creates a directory of the specified name in the current directory path.
pwd	Present Working Directory—Lists the complete path from where this command is entered.
rmdir *directory-name*	Delete Directory—Removes the specified directory from the current directory path. All files in the directory must first be deleted before the directory can be deleted.

The following example displays a detailed list of all the files for the WAE's current directory:

```
WAE# dir
size            time of last change               name
-------------   ------------------------          -----------
        4096  Fri Feb 24 14:40:00 2006   <DIR>    actona
        4096  Tue Mar 28 14:42:44 2006   <DIR>    core_dir
        4096  Wed Apr 12 20:23:10 2006   <DIR>    crash
        4506  Tue Apr 11 13:52:45 2006            dbupgrade.log
        4096  Tue Apr  4 22:50:11 2006   <DIR>    downgrade
        4096  Sun Apr 16 09:01:56 2006   <DIR>    errorlog
        4096  Wed Apr 12 20:23:41 2006   <DIR>    logs
       16384  Thu Feb 16 12:25:29 2006   <DIR>    lost+found
        4096  Wed Apr 12 03:26:02 2006   <DIR>    sa
       24576  Sun Apr 16 23:38:21 2006   <DIR>    service_logs
        4096  Thu Feb 16 12:26:09 2006   <DIR>    spool
     9945390  Sun Apr 16 23:38:20 2006            syslog.txt
    10026298  Thu Apr  6 12:25:00 2006            syslog.txt.1
    10013564  Thu Apr  6 12:25:00 2006            syslog.txt.2
    10055850  Thu Apr  6 12:25:00 2006            syslog.txt.3
    10049181  Thu Apr  6 12:25:00 2006            syslog.txt.4
        4096  Thu Feb 16 12:29:30 2006   <DIR>    var
         508  Sat Feb 25 13:18:35 2006            wdd.sh.signed
```

The following example displays only the detailed information for the logs directory:

```
WAE# dir logs
size          time of last change              name
-------------  -------------------------        -----------
       4096  Thu Apr  6 12:13:50 2006  <DIR>    actona
       4096  Mon Mar  6 14:14:41 2006  <DIR>    apache
       4096  Sun Apr 16 23:36:40 2006  <DIR>    emdb
       4096  Thu Feb 16 11:51:51 2006  <DIR>    export
         92  Wed Apr 12 20:23:20 2006           ftp_export.status
       4096  Wed Apr 12 20:23:43 2006  <DIR>    rpc_httpd
          0  Wed Apr 12 20:23:41 2006           snmpd.log
       4096  Sun Mar 19 18:47:29 2006  <DIR>    tfo
```

Directory Descriptions

Several top-level directories of the WAAS software contain information used internally by the software and are not useful to you. These directories include the core_dir, crash, downgrade, errorlog, lost+found, sa, service_logs, spool, and var directories.

Table 1-4 describes the directories that contain information that is useful for troubleshooting or monitoring.

Table 1-4   WAAS Directory Descriptions

Directory/File Name	Contents
actona	This directory contains the current software image installed on the WAAS device and any previous images that were installed.
logs	This directory contains application-specific logs used in troubleshooting. The *actona* subdirectory contains the commonly used Manager.log, Utilities.log, and Watchdog.log log files. See the *Cisco Wide Area Application Services Configuration Guide* for more details about how these log files are used.
syslog.txt	This file is the central repository for log messages. Important messages about the operation of WAAS or its components are sometimes logged in this file. They are often intermingled with routine messages that require no action. You may be requested to provide this file, the output of the **show tech-support** EXEC command, and perhaps other output to Cisco TAC personnel if a problem arises.

Note   The WAAS software uses the CONTENT file system for both the Wide Area File Services (WAFS) file system and the data redundancy elimination (DRE) cache.

Managing WAAS Files Per Device

The WAAS CLI provides several commands for managing files and viewing their contents per device. These commands are entered from privileged EXEC mode. Table 1-5 describes the WAAS file management commands.

Table 1-5   *WAAS File Management Commands*

Command	Description
copy {*source*	*image*}	Copy—Copies the selected source file, image, or configuration information: • cdrom—Copies the file from the CDROM. • compactflash—Copies the file from the CompactFlash card. • disk—Copies the configuration or file from the disk. • ftp—Copies the file from the FTP server. • http—Copies the file from the HTTP server. • running-config—Copies information from the current system configuration. • startup-config—Copies information from the startup configuration. • sysreport—Copies system information. • system-status—Copies the system status for debugging reference. • tech-support—Copies system information for technical support. • tftp—Copies the software image from the TFTP server.
cpfile *source-filename destination-filename*	Copy File—Makes a copy of a source file, and puts it in the current directory.
delfile *filename*	Remove File—Deletes the specified file from the current directory path.
less *filename*	Display File Using LESS—Displays the specified file on the screen using the LESS program. The filename is case sensitive. Enter **q** to stop viewing the file and return to the directory.
mkfile *filename*	Create File—Creates a file of the specified name in the current directory path.
rename *old-filename new-filename*	Rename File—Renames the specified file with a new filename.
type *filename*	Display File—Displays the content of the specified file on the screen.
type-tail *filename* [*line* | follow | | {begin *LINE* | exclude *LINE* | include *LINE*}]	Display End of File—Displays the last few lines of the specified file. Can also be used to view the last lines of a file continuously as new lines are added to the file, to start at a particular line in the file, or to include or exclude specific lines in the file.
find-pattern *pattern*	Find in a File—Searches a file for the specified pattern.

The following example shows how to save the currently running configuration to the startup configuration using the **copy** EXEC command:

```
WAE# copy running-config startup-config
```

Note   To back up, restore, or create a system report about the WAFS-specific configuration on a WAE, use the **wafs** EXEC command. To save the WAFS-system specific configuration information, use the **wafs backup-config** EXEC command. See the *Cisco Wide Area Application Services Configuration Guide* for more information on backing up.

The following example shows how to remove a file named sample from the directory named *test* using the **delfile** command:

```
WAE# cd test
WAE# ls
sample
sample2
WAE# delfile sample
WAE# ls
sample2
```

The following example shows how to view the last lines of the Watchdog.log file:

```
WAE# cd logs
WAE# cd actona
WAE# ls
Watchdog.log
WAE# type-tail Watchdog.log
[2006-01-30 15:13:44,769][FATAL] - System got fatal error going to restart.
[2006-03-19 18:43:08,611][FATAL] - System got fatal error going to restart.
[2006-03-19 19:05:11,216][FATAL] - System got fatal error going to restart.
WAE#
```