



## Understanding the Command-Line Interface

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This appendix includes the following topics, which describe how to use the command-line interface (CLI) on the Firewall Services Module (FWSM):

- [Command Prompts, page C-1](#)
- [Syntax Formatting, page C-2](#)
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### Note

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The CLI uses similar syntax and other conventions to the Cisco IOS CLI, but the FWSM operating system is not a version of Cisco IOS software. Do not assume that a Cisco IOS CLI command works or has the same function with the FWSM.

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## Command Prompts

When you are in the system configuration or in single context mode, the prompt begins with the host name:

```
FWSM
```

When you are within a context, the prompt begins with the host name followed by the context name:

```
FWSM/context
```

The prompt changes depending on the access mode:

- Unprivileged mode:

```
FWSM>
```

```
FWSM/context>
```

- Privileged mode, accessible by entering the **enable** command:

```
FWSM#
```

```
FWSM/context#
```

- Configuration mode, accessible by entering the **configure terminal** command:

```
FWSM(config)#
```

```
FWSM/context(config)#
```

- Subcommand mode, accessible when you enter a command that places you in a subcommand mode, such as **class** or **interface**:

```
FWSM(config-class)#
```

```
FWSM/context(config-if)#
```

## Syntax Formatting

Command syntax descriptions use the following conventions:

*Table C-1*

Convention	Description
<b>bold</b>	Bold text indicates commands and keywords that you enter literally as shown.
<i>italics</i>	Italic text indicates arguments for which you supply values.
[x]	Square brackets enclose an optional element (keyword or argument).
	A vertical line indicates a choice within an optional or required set of keywords or arguments.
[x   y]	Square brackets enclosing keywords or arguments separated by a vertical line indicate an optional choice.
{x   y}	Braces enclosing keywords or arguments separated by a vertical line indicate a required choice.
[x {y   z}]	Nested sets of square brackets or braces indicate optional or required choices within optional or required elements. Braces and a vertical line within square brackets indicate a required choice within an optional element.

## Abbreviating Commands

You can abbreviate most commands down to the fewest unique characters for a command; for example, you can enter **wr t** to view the configuration instead of entering the full command **write terminal**, or you can enter **en** to start privileged mode and **con te** to start configuration mode. In addition, you can enter **0** to represent **0.0.0.0**.

## Command Line Editing

The FWSM uses the same command-line editing conventions as Cisco IOS software. You can view all previously entered commands with the **show history** command or individually with the up arrow or **^p** command. Once you have examined a previously entered command, you can move forward in the list with the down arrow or **^n** command. When you reach a command you wish to reuse, you can edit it or press the **Enter** key to start it. You can also delete the word to the left of the cursor with **^w**, or erase the line with **^u**.

The FWSM permits up to 512 characters in a command; additional characters are ignored.

## Filtering Show Command Output

You can use the “pipe” operator (**|**) with any **show** command and include a filter option and filtering expression. The filtering is performed by matching each output line with a regular expression, similar to Cisco IOS software. By selecting different filter options you can include or exclude all output that matches the expression. You can also display all output beginning with the line that matches the expression.

The syntax for using filtering options with the **show** command is as follows:

```
show command | {include | exclude | begin | grep [-v]} regexp
```

In this command string, the first vertical bar (**|**) is the pipe operator and must be included in the command. This operator directs the output of the **show** command to the filter. In the syntax diagram, the other vertical bars (**|**) indicate alternative options and are not part of the command.

The **include** option includes all output lines that match the regular expression. The **grep** option without **-v** has the same effect. The **exclude** option excludes all output lines that match the regular expression. The **grep** option with **-v** has the same effect. The **begin** option shows all the output lines starting with the line that matches the regular expression.

Replace *regexp* with any Cisco IOS regular expression. The regular expression is not enclosed in quotes or double-quotes, so be careful with trailing white spaces, which will be taken as part of the regular expression.

When creating regular expressions, you can use any letter or number that you want to match. In addition, certain keyboard characters have special meaning when used in regular expressions. [Table C-2](#) lists the keyboard characters that have special meaning.

**Table C-2 Using Special Characters in Regular Expressions**

Character Type	Character	Special Meaning
period	.	Matches any single character, including white space.
asterisk	*	Matches 0 or more sequences of the pattern.
plus sign	+	Matches 1 or more sequences of the pattern.
caret	^	Matches the beginning of the input string.
dollar sign	\$	Matches the end of the input string.
underscore	_	Matches a comma (,), left brace ({}), right brace (}), left parenthesis, right parenthesis, the beginning of the input string, the end of the input string, or a space.
brackets	[ ]	Designates a range of single-character patterns.

Table C-2 Using Special Characters in Regular Expressions (continued)

Character Type	Character	Special Meaning
hyphen	-	Separates the end points of a range.
parentheses	()	(Border Gateway Protocol (BGP) specific) Designates a group of characters as the name of a confederation.

## Command Output Paging

On commands such as **help** or **?**, **show**, **show xlate**, or other commands that provide long listings, you can determine if the information displays a screen and pauses, or lets the command run to completion. The **pager** command lets you choose the number of lines to display before the More prompt appears.

When paging is enabled, the following prompt appears:

```
<--- More --->
```

The More prompt uses syntax similar to the UNIX **more** command:

- To view another screen, press the Space bar.
- To view the next line, press the **Enter** key.
- To return to the command line, press the **q** key.

## Adding Comments

You can precede a line with a colon (:) to create a comment. However, the comment only appears in the command history buffer and not in the configuration. Therefore, you can view the comment with the **show history** command or by pressing an arrow key to retrieve a previous command, but because the comment is not in the configuration, the **write terminal** command does not display it.

## Text Configuration Files

This section describes how to format a text configuration file that you can download to the FWSM, and includes the following topics:

- [How Commands Correspond with Lines in the Text File, page C-5](#)
- [Subcommands, page C-5](#)
- [Automatic Text Entries, page C-5](#)
- [Commands Not Included in the Text Configuration, page C-5](#)
- [Passwords, page C-6](#)
- [Multiple Security Context Files, page C-6](#)

To download the file, see the “[Downloading a Text Configuration](#)” section on page 16-6.

## How Commands Correspond with Lines in the Text File

The text configuration file includes lines that correspond with the commands described in this guide and in the *Catalyst 6500 Series Switch and Cisco 7600 Series Router Firewall Services Module Command Reference*.

In most cases, commands described in this guide are preceded by a CLI prompt. The prompt in the following example is “FWSM(config)#”:

```
FWSM(config)# class gold
```

In the text configuration file you are not prompted to enter commands, so the prompt is omitted:

```
class gold
```

## Subcommands

Subcommands appear indented under the main command when entered at the command line. Your text file lines do not need to be indented, as long as the subcommands appear directly following the main command. For example, the following unindented text is read the same as indented text:

```
class silver
limit all 5%
class gold
    limit all 10%
```

## Automatic Text Entries

When you download a configuration to the FWSM, the FWSM inserts some lines automatically. For example, the FWSM inserts lines for default settings or for the time the configuration was modified. You do not need to enter these automatic entries when you create your text file.

## Line Order

For the most part, commands can be in any order in the file. However, some lines, such as access control entries (ACEs), are processed in the order they appear, and the order can affect the function of the access control list (ACL). Other commands might also have order requirements. For example, you must enter the **nameif** command for an interface before you assign an IP address to it because many subsequent commands use the name of the interface. Also, subcommands must directly follow the main command.

## Commands Not Included in the Text Configuration

Some commands do not insert lines in the configuration. For example, a runtime command such as **show config** does not have a corresponding line in the text file. Commands that you might expect to have entries but do not are noted in this guide, such as **activation key** or **mode multiple**.

## Passwords

The login, enable, and user passwords are automatically encrypted before they are stored in the configuration. For example, the encrypted form of the password “letmein” might look like jMorNbK0514fadBh. You can copy the configuration passwords to another FWSM in their encrypted form, but you cannot unencrypt the passwords yourself.

If you enter an unencrypted password in a text file, the FWSM does not automatically encrypt them when you copy the configuration to the FWSM. The FWSM only encrypts them when you save the running configuration from the command line using the **copy running-config startup-config** or **write memory** command.

## Multiple Security Context Files

For multiple security contexts, the entire configuration consists of multiple parts:

- The security context configurations
- The system configuration, which identifies basic settings for the FWSM, including a list of contexts
- The admin context, which provides network interfaces for the system configuration

The system configuration does not include any interfaces or network settings for itself. Rather, when the system needs to access network resources (such as downloading the contexts from the server), it uses a context that is designated as the admin context.

Each context is similar to a single context mode configuration. The system configuration differs from a context configuration in that the system configuration includes system-only commands (such as a list of all contexts) while other typical commands are not present (such as many interface parameters).

See [Chapter 5, “Managing Security Contexts,”](#) for more information about contexts.

## Command Help

Help information is available from the command line by entering **help** or a question mark to list all commands, or after a command to list command syntax; for example, **arp ?**.

The number of commands listed when you use the question mark or **help** command differs by access mode so that unprivileged mode offers the least commands and configuration mode offers the greatest number of commands.

In addition, you can enter any command by itself on the command line and then press **Enter** to view the command syntax.