

Chapter 3

CLI Basics

This chapter provides basic information about the JUNOS CLI. Topics include:

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Elements of the Command-Line Interface

Figure 5 shows elements of the command-line interface in operational mode.

Figure 5: Elements of the Command-Line Interface

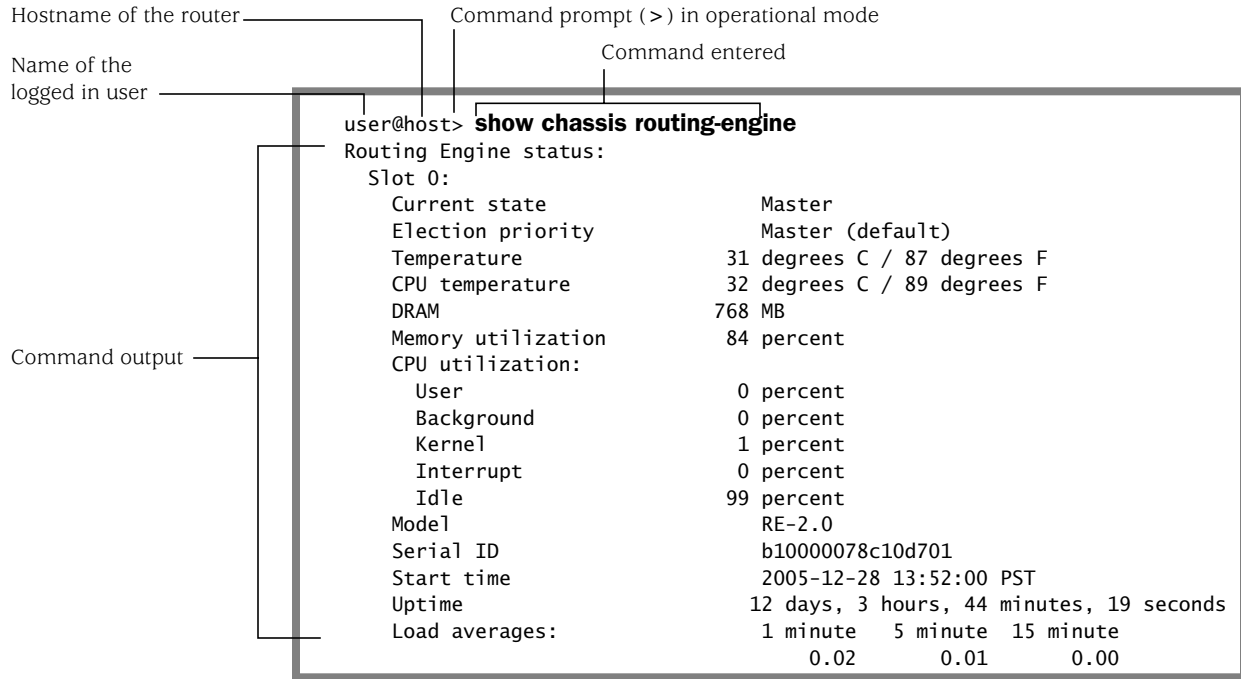
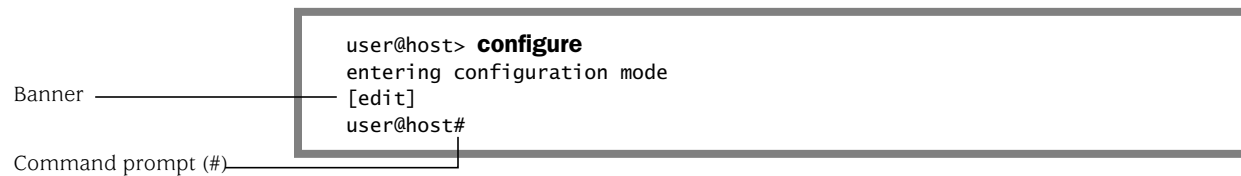


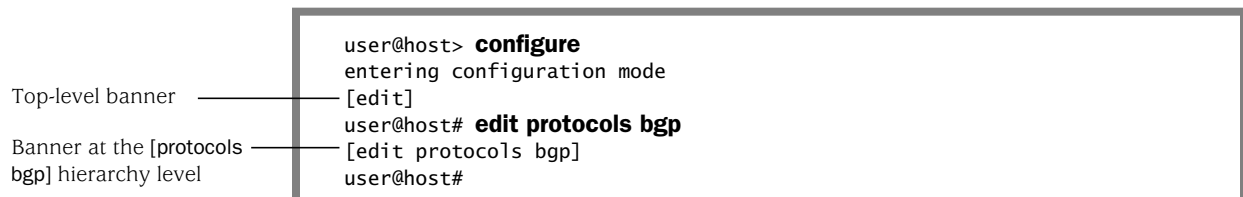
Figure 6 shows elements of the command-line interface in configuration mode. In configuration mode, the prompt changes from a > to a #.

Figure 6: Command Prompt in Configuration Mode



The portion of the prompt in square brackets, [edit], is a *banner*. The banner indicates that you are in configuration mode and shows your location in the statement hierarchy. When you first enter configuration mode, you are always at the top level of the hierarchy, as indicated by the [edit] banner. (See Figure 7.)

Figure 7: Hierarchy Level Banner



CLI Messages

The CLI displays messages when you enter and exit from configuration and operational command modes, when you successfully complete some commands, and when you type an invalid string or value.

If you type an invalid string—for example, the name of a command or statement that does not exist—you see the message “syntax error” or “unknown command”. A caret (^) indicates where the error is. For example:

```

user@host> clear route <Enter>
                ^
syntax error, expecting <command>.

[edit]
user@host# telnet
                ^
unknown command.
  
```

When the number of choices is limited, a message might display the commands you can enter to correct the syntax error. For example:

```

[edit]
user@host# load myconfig-file<Enter>
                ^
syntax error, expecting 'merge', 'override', or 'replace'.
  
```

In configuration mode, if you do not type an option for a statement that requires one, a message indicates the type of information expected.

In this example, you need to type an area number to complete the command:

```
[edit]
user@host# set protocols ospf area<Enter>
                                     ^
syntax error, expecting <identifier>.
```

In this example, you need to type a value for the hello interval to complete the command:

```
[edit]
user@host# set protocols ospf area 45 interface so-0/0/0
hello-interval<Enter>
                                     ^
syntax error, expecting <data>
```

If you have omitted a required statement at a particular hierarchy level, when you attempt to move from that hierarchy level or when you issue the **show** command in configuration mode, a message indicates which statement is missing. For example:

```
[edit system login user phil]
user@host# up
Warning: missing mandatory statement: 'class'
[edit system login]
user@host# show
user phil {
    full-name "Phil James";
    # Warning: missing mandatory statement(s): 'class'
}
```

Displaying Command Output

If the command output is longer than the screen length, it appears one screen at a time by means of a UNIX `more`-type interface. The prompt `-(more)-` indicates that more output is available. (See Figure 8.)

Figure 8: The `-(more)-` Prompt

```

user@host> show task
Pri Task Name                               Pro  Port So Flags
 10 LMP Client                               16 <>
 10 IF
 15 INET6
 15 INET
 15 ISO
 15 Memory
 20 RPD UNIX Domain Server./var/run/rpd_serv.local
                                           21 <>
 20 RPD UNIX Domain Server./var/run/rpd_serv.local
                                           20 <>
 20 RPD Server.0.0.0.0+666                   666 12 <Accept>
 20 Aggregate
 20 RT
 30 ICMP                                     1
 30 Router-Advertisement
 30 ICMPv6                                   58   9 <>
---(more)---

```

The `---(more)---` prompt

To continue command output, press Return.

Table 5 lists some common keyboard sequences you can use at the `-(more)-` prompt. As soon as the CLI knows how long the output is (usually by the second screen), it displays the percentage of the command output above the prompt.

Occasionally, if a command produces extensive output, you may wish to cancel the output.

To cancel command output, press `Ctrl + c`. Command output stops and the command prompt appears. (See Figure 9.)

Figure 9: Canceling Command Output

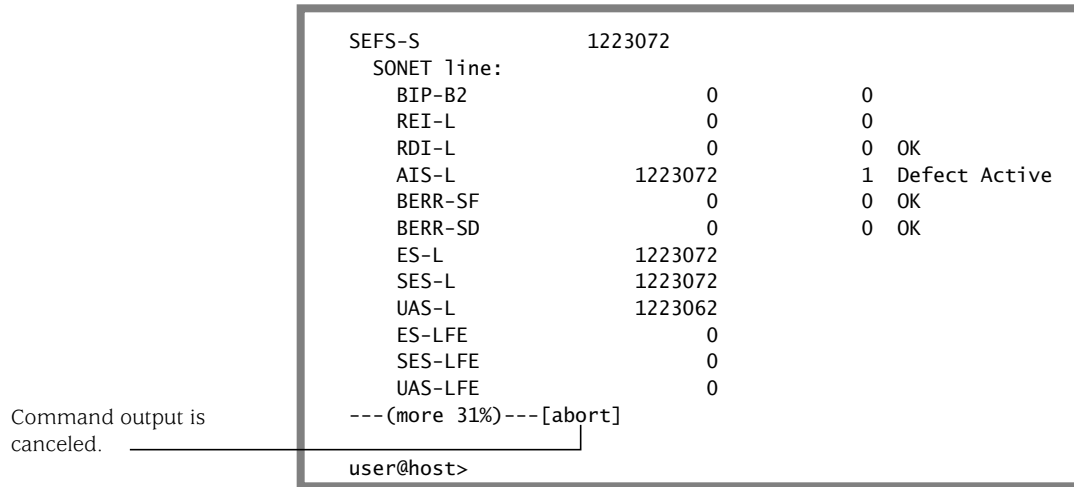


Table 5: —more— Prompt Keyboard Sequences

Category	Action	Keyboard Sequence
Scroll Down	Scroll down one line.	Enter, Return, k, Ctrl + m, Ctrl + n, or Down Arrow
	Scroll down one-half screen.	Tab, d, Ctrl + d, or Ctrl + x
	Scroll down one whole screen.	Space or Ctrl + f
	Scroll down to the bottom of the output.	Ctrl + e or G
	Display the output all at once instead of one screen at a time. (Same as specifying the no-more command.)	N
Scroll Up	Display the previous line of output.	j, Ctrl + h, Ctrl + p, or Up Arrow
	Scroll up one-half screen.	u or Ctrl + u
	Scroll up one whole screen.	b or Ctrl + b
	Scroll up to the top of the output.	Ctrl + a or g

For more information about working with command output, see “Filtering Command Output” on page 137.

Types of Commands and Statements

The JUNOS CLI supports the following types of commands and statements:

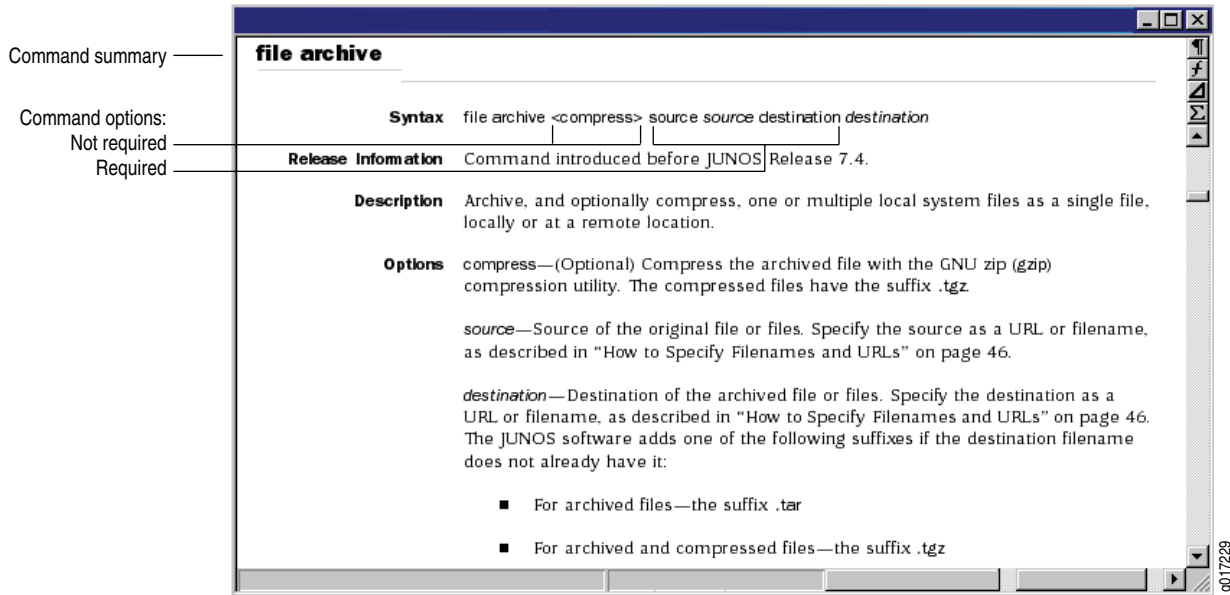
- Operational mode commands—Commands you enter in operational mode are used to monitor router operation. This book describes the top-level operational mode commands.
 - For more information on using top-level CLI operational mode commands, see “Using CLI Operational Commands to Monitor the Router” on page 49.
 - For a complete list of CLI operational mode commands, see the JUNOS command reference guides.
- Environment commands—Environment commands are operational mode commands you can use to control the CLI environment. For example, you can specify the number lines that are displayed on the screen or your terminal type. For more information, see “Controlling the CLI Environment” on page 147.
- Configuration mode commands—Commands you enter in configuration mode are used to perform general configuration functions; for example, committing a configuration, copying statements, navigating the hierarchy, and managing configuration files. For more information, see “Using Commands and Statements to Configure the Router” on page 75.
- Configuration statements—Configuration statements are used to define your router configuration. Your location in the configuration hierarchy determines which configuration statements are available. For example, the [edit interfaces] hierarchy level includes statements to configure router interfaces.
 - For more information, see the JUNOS software configuration guides.
 - For a complete list of JUNOS configuration statements and the statement hierarchy, see the *JUNOS Hierarchy and RFC Reference*.

Command Options

When working on the command line, you are bound by specific CLI syntax rules. Some commands function very simply with just a single word necessary to run them. Others have required options that you must enter to complete the command. Additionally, commands may have options that are not required, allowing you to change the way they run or the information they return.

The command and statement summaries in the JUNOS software books show which options are required and which options are not. Options that are not required are shown with angle brackets (< >). (See Figure 10 on page 32.)

Figure 10: Command Options



Configuration Statements and Identifiers

You configure all router properties by including *statements* in the configuration. A statement consists of a keyword, which is fixed text, and, optionally, an *identifier*. An identifier is an identifying name which you define, such as the name of an interface or a username, and which allows you and the CLI to discriminate among a collection of statements.

The following list shows the statements available at the top level of configuration mode (that is, the trunk of the hierarchy tree).

```

user@host# set ?
Possible completions:
> accounting-options      Accounting data configuration
+ apply-groups            Groups from which to inherit configuration
data
> chassis                 Chassis configuration
> class-of-service        Class-of-service configuration
> firewall                Define a firewall configuration
> forwarding-options      Configure options to control packet sampling
> groups                  Configuration groups
> interfaces              Interface configuration
> policy-options           Routing policy option configuration
> protocols                Routing protocol configuration
> routing-instances        Routing instance configuration
> routing-options          Protocol-independent routing option
configuration
> snmp                     Simple Network Management Protocol
> system                   System parameters
    
```

An angle bracket (>) before the statement name indicates that it is a container statement and that you can set values for other statements at levels below it.

If there is no angle bracket (>) before the statement name, the statement is a leaf statement; you cannot define other statements at hierarchy levels below it.

A plus sign (+) before the statement name indicates that it can contain a set of values. To specify a set, include the values in brackets. For example:

```
[edit]
user@host# set policy-options community my-as1-transit members [65535:10
65535:11]
```

For statements that include identifiers, such as interface names, you must specify the identifier in a JUNOS-defined format. For example, the interface name `so-0/0/0` refers to a SONET/SDH interface that is on the Flexible PIC Concentrator (FPC) in slot 0, in the first PIC location, and in the first port on the Physical Interface Card (PIC). For other identifiers, such as interface descriptive text and policy and firewall term names, you can specify any name, including special characters, spaces, and tabs.

You must enclose in quotation marks (double quotes) identifiers and any strings that include the following characters: space tab () [] { } ! @ # \$ % ^ & | ' = ?

Privilege Levels for Using Commands and Statements

Each CLI command and each configuration statement has an access privilege level associated with it. Users can execute only those commands and configure and view only those statements for which they have access privileges.

For example, users with `configure` permissions can use the `configure` command to enter configuration mode, and users with `firewall` permissions can view the firewall filter configuration in configuration mode. The root login account has superuser privileges—with access to all commands and statements.

Required privilege levels are listed in command and statement summaries. For more information about setting user accounts and privileges, see the *JUNOS System Basics Configuration Guide*.

Switching Between Operational Mode and Configuration Mode

When you monitor and configure a router, you may need to switch between operational mode and configuration mode. When you change to configuration mode, the command prompt also changes. The operational mode prompt is a right angle bracket (>) and the configuration mode prompt is a pound sign (#).

To switch between operational mode and configuration mode:

1. When you log in to the router and type the `cli` command, you are automatically in operational mode:

```
user@host# cli
user@host >
```

2. To enter configuration mode, type the `configure` command or the `edit` command from the CLI operation mode. For example:

```
user@host> configure
entering configuration mode
[edit]
user@host#
```

The CLI prompt changes from `user@host>` to `user@host#` and a banner appears to indicate the hierarchy level.

3. You can return to operational mode in one of the following ways:

- To commit the configuration and exit:

```
[edit]
user@host# commit and-quit
commit complete
Exiting configuration mode
user@host>
```

- To exit without committing:

```
[edit]
user@host# exit
Exiting configuration mode
user@host>
```

When you exit configuration mode, the CLI prompt changes from `user@host#` to `user@host>` and the banner no longer appears. You can enter or exit configuration mode as many times as you wish without committing your changes.

4. To display the output of an operational mode command, such as `show`, while in configuration mode, issue the `run` configuration mode command and then specify the operational mode command:

```
[edit]
user@host# run operational-mode-command
```

For example, to display the currently set priority value of the Virtual Router Redundancy Protocol (VRRP) primary router while you are modifying the VRRP configuration for a backup router:

```
[edit interfaces xe-4/2/0 unit 0 family inet vrrp-group 27]
user@host# show
virtual-address [ 192.168.1.15 ];
[edit interfaces xe-4/2/0 unit 0 family inet vrrp-group 27]
user@host# run show vrrp detail
Physical interface: xe-5/2/0, Unit: 0, Address: 192.168.29.10/24
Interface state: up, Group: 10, State: backup
Priority: 190, Advertisement interval: 3, Authentication type: simple
Preempt: yes, VIP count: 1, VIP: 192.168.29.55
Dead timer: 8.326, Master priority: 201, Master router: 192.168.29.254
[edit interfaces xe-4/2/0 unit 0 family inet vrrp-group 27]
user@host# set priority ...
```

Moving Among Hierarchy Levels

You can use the CLI commands in Table 6 to navigate the levels of the configuration statement hierarchy.

Table 6: CLI Configuration Mode Navigation Commands

Command	Description
<code>edit hierarchy-level</code>	Moves to an existing configuration statement hierarchy or creates a hierarchy and moves to that level.
<code>exit</code>	Moves up the hierarchy to the previous level where you were working. This command is, in effect, the opposite of the <code>edit</code> command. Alternatively, you can use the <code>quit</code> command. <code>exit</code> and <code>quit</code> are interchangeable.
<code>up</code>	Moves up the hierarchy one level at a time.
<code>top</code>	Moves directly to the top level of the hierarchy.

Displaying CLI Command History

To display a list of recent commands that you issued, use the `show cli history` command:

```
user@host> show cli history
03-03 01:00:50 – show cli history
03-03 01:01:12 – show interfaces terse
03-03 01:01:22 – show interfaces lo0
03-03 01:01:44 – show bgp next-hop-database
03-03 01:01:51 – show cli history
```

By default, this command displays the last 100 commands issued in the CLI. If you specify a number with the command, it displays that number of recent commands. For example:

```
user@host> show cli history 3
01:01:44 – show bgp next-hop-database
01:01:51 – show cli history
01:02:51 – show cli history 3
```

Displaying CLI Word History

You can type `Esc + .` (period) or `Alt + .` (period) to insert the last word of the previous command. Repeat `Esc + .` or `Alt + .` to scroll backwards through the list of recently entered words. For example:

```
user@host> show interfaces terse fe-0/0/0
Interface      Admin  Link  Proto  Local  Remote
fe-0/0/0       up     up
fe-0/0/0.0     up     up     inet   192.168.220.1/30
user@host> <Esc>.  
user@host> fe-0/0/0
```

If you scroll completely to the beginning of the list, typing `Esc + .` or `Alt + .` again restarts scrolling from the last word entered.