

# Chapter 3

## Monitor and Perform System Management Functions

Table 5 summarizes the command-line interface (CLI) commands you can use to perform system management functions and monitor system management functions. In the table, the commands are grouped by functionality. In the remainder of this chapter, the commands are explained alphabetically.

**Table 5: Commands for Monitoring and Performing System Management**

Task	Task or Information to Monitor	Command
<b>Software Version</b>	Versions of software running on the router.	show version on page 95
	JUNOS software extensions.	show system software on page 88
<b>Router Up Time</b>	Current time and how long the router has been operational.	show system uptime on page 91
<b>Configuration</b>	Current running system configuration.	show configuration on page 58
	Verify the syntax of a configuration file.	test configuration on page 98
<b>User Account Information</b>	Users currently logged into the router.	show system users on page 92
	Login permissions for the current user.	show cli authorization on page 57
<b>Log Files and Recent History</b>	Log files and their contents and recent user logins.	show log on page 60
	Monitor the contents of log files.	monitor on page 46
	Recent CLI history.	show cli history on page 58
<b>Remote System Reachability</b>	Check host reachability and network connectivity.	ping on page 47
	Check the reachability of a remote ATM node.	ping atm on page 49
	Determine the route to a network system.	traceroute on page 99
	Network connection information.	show system connections on page 79
<b>Connecting to Remote Systems</b>	Open secure shell connections between the local router and a remote system.	ssh on page 96
	Open a Telnet session to a remote system.	telnet on page 97
<b>Network Time Protocol</b>	NTP peers and their state.	show ntp associations on page 61
	NTP peer variables.	show ntp status on page 62

Task	Task or Information to Monitor	Command
<b>Packet Forwarding Engine</b>	Packet Forwarding Engine FPC.	show pfe fpc on page 63
	Packet Forwarding Engine information.	show pfe terse on page 74
	Packet Forwarding Engine next-hop.	show pfe next-hop on page 64
	Packet Forwarding Engine route.	show pfe route on page 65
	Packet Forwarding Engine SCB.	show pfe scb on page 66
	Packet Forwarding Engine SFM.	show pfe sfm on page 68
	Packet Forwarding Engine statistics.	show pfe statistics dma on page 70 show pfe statistics error on page 71 show pfe statistics ip on page 72 show pfe statistics notification on page 73 show pfe statistics pio on page 73 show pfe statistics traffic on page 74
<b>System Software</b>	System memory and buffer usage information.	show system buffers on page 78
	Software processes running on the router.	show system processes on page 81
	Systemwide protocol-related statistics.	show system statistics on page 88
	Statistics about amount of free disk space in the router's file systems.	show system storage on page 90
	Routing, routing protocol, and interface tasks that are currently running.	show task on page 93
	State and checksum value for files in a file system.	show system audit on page 75
<b>Host Name Lookup</b>	Hostname lookup using DNS.	show host on page 59
<b>ARP Table</b>	Contents of the ARP table.	show arp on page 56
	Zero the contents of the ARP table.	clear arp on page 43
<b>Stop and Restart Processes and Software</b>	Restart a JUNOS software process.	restart on page 55
	Install or remove software bundles or packages from the router.	request system software on page 54
	Stop the routing software.	request system halt on page 51
	Reboot the routing software.	request system reboot on page 52
	Pending system halts or reboots.	show system reboot on page 87
	Clear a pending system halt or reboot.	clear system reboot on page 44
	Back up the file systems on the router.	request system snapshot on page 53
<b>Manipulate Files</b>	Copy a file to another location on the router or to another system on the network.	file copy on page 44
	List files and directories on the router.	file list on page 45
	Display the contents of a file.	file show on page 46
	Rename a file on the router.	file rename on page 45
	Delete a file on the router.	file delete on page 45
<b>Create a Shell</b>	Create a UNIX-level shell.	start on page 97
<b>Systemwide Messages</b>	Send messages to users currently logged into the router.	request message on page 50
<b>System Boot Messages</b>	Display boot messages.	show system boot-messages on page 76
<b>Information for Customer Support</b>	Collect system information before contacting customer support.	request support information on page 50
<b>Exit from CLI</b>	Exit from the CLI to a UNIX shell.	quit on page 49

## How to Specify Filenames and URLs

In some system management and other commands, you can specify a filename or URL. You can specify a filename or URL in one of the following ways:

*filename*—File in the user's home directory (the current directory) on the local flash disk.

*path/filename*—File on the local flash disk.

*/var/filename* or */var/path/filename*—File on the local hard disk.

*a:filename* or *a:path/filename*—File on the local drive. The default path is / (the root-level directory). The floppy can be in either MS-DOS or UNIX (UFS) format.

*hostname:path/filename* or *scp://hostname:path/filename*—File on an scp/ssh client. This form is not available in the worldwide version of the JUNOS software. The default path is the user's home directory on the remote system. You can also specify *hostname* as *username@hostname* or *username:password@hostname*. If a password is required and you omit it, you are prompted for it.

*ftp://hostname/path/filename*—File on an FTP server. You can also specify *hostname* as *username@hostname* or *username:password@hostname*. To have the system prompt you for the password, specify *prompt* in place of the password. If a password is required, and you do not specify the password or prompt, an error message is displayed:

```
user@host > file copy ftp://username@ftp.hostname.net/filename
file copy ftp.hostname.net: Not logged in.
user@host > file copy ftp://username:prompt@ftp.hostname.net/filename
Password for username@ftp.hostname.net:
```

*http://hostname/path/filename*—File on an HTTP server. You can also specify *hostname* as *username@hostname* or *username:password@hostname*. If a password is required and you omit it, you are prompted for it.

## clear arp

**Syntax** `clear arp <hostname hostname>`

**Description** Remove entries from the ARP table.

**Options** `none`—Clear all entries.

`hostname hostname`—(Optional) Name of specific host to clear.

**Required Privilege Level** `clear`

**Sample Output**

```
user@host> clear arp
user@host>
```

## clear log

**Syntax** clear log <filename | all>

**Description** Remove contents of a log file.

**Options** all—Truncate the current log file and delete all archived log files.

filename—Truncate the specific log file.

**Required Privilege Level** clear

## clear system reboot

**Syntax** clear system reboot

**Description** Clear any pending system software reboots or halts.

**Required Privilege Level** maintenance

**See Also** request system reboot on page 52

**Sample Output**

```
user@host> clear system reboot
reboot requested by root at Sat Dec 12 19:37:34 1998
[process id 17855]
Terminating...
```

## file copy

**Syntax** file copy source destination

**Description** Copy files from one place to another on the local router or between the local router and a remote system.

**Options** destination—Destination of the copied file. Specify this as a URL or filename, as described in “How to Specify Filenames and URLs” on page 43. If you are copying a file to the current directory (your home directory on the local router) and are not renaming the file, specify the destination with a period (.).

source—Source of the original file. Specify this as a URL or filename, as described in “How to Specify Filenames and URLs” on page 43

**Required Privilege Level** maintenance

**Sample Output**

```
user@host> copy /var/tmp/rpd.core.4 berry:/c/junipero/tmp
...transferring.file..... |          0 KB |    0.3 kB/s | ETA: 00:00:00 | 100%
```

The following is an example of copying a configuration file from Routing Engine 0 to Routing Engine 1:

```
user@host> file copy /config/juniper.conf rel:/var/tmp/copied-juniper.conf
```

## file delete

<b>Syntax</b>	file delete <i>filename</i>
<b>Description</b>	Delete a file on the local router.
<b>Options</b>	<i>filename</i> —Name of the file to delete.
<b>Required Privilege Level</b>	maintenance
<b>Sample Output</b>	<pre> user@host&gt; file list /var/tmp dcd.core rpd.core snmpd.core user@host&gt; file delete /var/tmp/snmpd.core user@host&gt; file list /var/tmp dcd.core rpd.core </pre>

## file list

<b>Syntax</b>	file list <i>filename</i>
<b>Description</b>	Display a list of files on the local router.
<b>Options</b>	<i>filename</i> —Name of a directory or file.
<b>Required Privilege Level</b>	maintenance
<b>Sample Output</b>	<pre> user@host&gt; file list /var/tmp dcd.core rpd.core snmpd.core </pre>

## file rename

<b>Syntax</b>	file rename <i>source destination</i>
<b>Description</b>	Rename a file on the local router.
<b>Options</b>	<p><i>destination</i>—New name for the file.</p> <p><i>source</i>—Original name of the file.</p>
<b>Required Privilege Level</b>	maintenance
<b>Sample Output</b>	<pre> user@host&gt; file list /var/tmp dcd.core rpd.core snmpd.core user@host&gt; file rename /var/tmp/dcd.core /var/tmp/dcd.core.990413 user@host&gt; file list /var/tmp dcd.core.990413 rpd.core snmpd.core </pre>

## file show

**Syntax** file show *source filename*

**Description** Display the contents of a file.

**Options** *filename*—Name of a file.

**Required Privilege Level** maintenance

**Sample Output**

```
user@host> file list /var/log/messages
Apr 13 21:00:08 romney /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:00:40 romney /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:02:48 romney last message repeated 4 times
Apr 13 21:07:04 romney last message repeated 8 times
Apr 13 21:07:13 romney /kernel: so-1/1/0: Clearing SONET alarm(s) RDI-P
Apr 13 21:07:29 romney /kernel: so-1/1/0: Asserting SONET alarm(s) RDI-P
Apr 13 21:07:36 romney /kernel: so-1/1/2: loopback suspected; going to standby.
Apr 13 21:08:08 romney /kernel: so-1/1/2: loopback suspected; going to standby.
...
```

## monitor

**Syntax** monitor (start | stop) *list*

**Description** Display the end of system log or trace files and additional entries being added to those files.

Log files are generated by the routing protocol process or by syslog. The log files generated by syslog are those configured with the syslog statement at the [edit system] hierarchy level and the options statement at the [edit routing-options] hierarchy level. The trace files generated by the routing protocol process are those configured with traceoptions statements at the [edit routing-options], [edit interfaces], and [edit protocols *protocol*] hierarchy levels.

For explanation of specific errors, see the show interfaces extensive command.

**Options** *llist*—Display status of monitored files.

*start*—Start displaying the file contents.

*stop*—Stop displaying the file contents.

**Required Privilege Level** trace

**See Also** show interfaces on page 126

**Output Fields** *\*\*\* filename \*\*\**—Name of the file from which entries are being displayed. This line is displayed initially and when the command switches between log files.

**Sample Output**

```
user@host> monitor start system-log
*** system-log***
Jul 20 15:07:34 hang sshd[5845]: log: Generating 768 bit RSA key.
Jul 20 15:07:35 hang sshd[5845]: log: RSA key generation complete.
Jul 20 15:07:35 hang sshd[5845]: log: Connection from 204.69.248.180 port 912
Jul 20 15:07:37 hang sshd[5845]: log: RSA authentication for root accepted.
Jul 20 15:07:37 hang sshd[5845]: log: ROOT LOGIN as 'root' from trip.jcmax.com
Jul 20 15:07:37 hang sshd[5847]: log: executing remote command as root: scp -t /
tmp
Jul 20 15:07:37 hang sshd[5845]: log: Closing connection to 204.69.248.180
```

## ping

- Syntax** ping *address* <bypass-routing> <count *requests*> <do-not-fragment>  
<interface *source-interface*> <interval *seconds*> <local *echo-address*>  
<pattern *string*> <record-route> <size *bytes*> <strict> <tos *type-of-service*>  
<ttl *value*> <via *route*> <rapid | detail>
- Description** Check host reachability and network connectivity.
- The ping command sends ICMP ECHO\_REQUEST messages to elicit ICMP ECHO\_RESPONSE messages from the specified host.
- Type Control-C to interrupt a ping command.
- Options** *address*—IP address or name of the remote system to ping.
- bypass-routing*—(Optional) Bypass the normal routing tables and send ping requests directly to a system on an attached network. If the system is not on a directly attached network, an error is returned. Use this option to ping a local system through an interface that has no route through it.
- count requests*—(Optional) Number of ping requests to send.  
**Range:** 0 through 10,000  
**Default:** No limit to the number of requests sent. Type Control-C to interrupt a ping command.
- detail*—(Optional) Include in the output the interface on which the ping reply was received.
- do-not-fragment*—(Optional) Set the do-not-fragment (DF) bit in the IP header of the ping packets.
- interface source-interface*—(Optional) Interface to use to send the ping requests.
- interval seconds*—(Optional) How often to send ping requests.  
**Range:** 0.1 through 10,000 seconds  
**Default:** 1 second
- local echo-address*—(Optional) Set the source IP address (the local address) in outgoing ECHO\_REQUEST packets. By default, ping leaves the choice of local address up to the kernel, which usually chooses the local address based on the interface out which the packet is leaving the router.
- pattern string*—(Optional) Specify a 16-bit pattern string to include in the ping packet.  
**Range:** 0 through 65536
- rapid*—(Optional) Send ping requests rapidly. The results are reported in a single message, not in individual messages for each ping request. By default, five ping request are sent before the results are reported. To change the number of request, include the count option.
- record-route*—Record and report the packet's path.

size *bytes*—(Optional) Size of ping request packets.

**Range:** 0 through 8192 bytes

**Default:** 56 bytes, which is effectively 64 bytes because 8 bytes of ICMP header data are added to the packet.

strict —(Optional) Use strict source route option.

tos *type-of-service*—(Optional) Set the type-of-service (TOS) bit in the IP header of the ping packets.

ttl *value*—(Optional) TTL value to include in the ping request.

**Range:** 0 through 128

via *route*—(Optional) Specify the intermediate router through which the packet should traverse on its way to the system being pinged. Configuring an intermediate router sets the loose source route field in the IP header.

**Required Privilege Level** network

#### Sample Output

```
user@host> ping boojum
PING boojum.juniper.net (192.156.169.254): 56 data bytes
64 bytes from 192.156.169.254: icmp_seq=0 ttl=253 time=1.028 ms
64 bytes from 192.156.169.254: icmp_seq=1 ttl=253 time=1.053 ms
64 bytes from 192.156.169.254: icmp_seq=2 ttl=253 time=1.025 ms
64 bytes from 192.156.169.254: icmp_seq=3 ttl=253 time=1.098 ms
64 bytes from 192.156.169.254: icmp_seq=4 ttl=253 time=1.032 ms
64 bytes from 192.156.169.254: icmp_seq=5 ttl=253 time=1.044 ms
^C [abort]

user@host> ping boojum size 200 count 5
PING boojum.juniper.net (192.156.169.254): 200 data bytes
208 bytes from 192.156.169.254: icmp_seq=0 ttl=253 time=1.759 ms
208 bytes from 192.156.169.254: icmp_seq=1 ttl=253 time=2.075 ms
208 bytes from 192.156.169.254: icmp_seq=2 ttl=253 time=1.843 ms
208 bytes from 192.156.169.254: icmp_seq=3 ttl=253 time=1.803 ms
208 bytes from 192.156.169.254: icmp_seq=4 ttl=253 time=17.898 ms

--- boojum.juniper.net ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max = 1.759/5.075/17.898 ms

user@host> ping boojum rapid
PING boojum.juniper.net (192.156.169.254): 56 data bytes
!!!!
--- boojum.juniper.net ping statistics ---
5 packets transmitted, 5 packets received, 0% packet loss
round-trip min/avg/max/stddev = 0.956/0.974/1.025/0.026 ms
```

## ping atm

<b>Syntax</b>	ping atm vci <vpi.> vci interface <i>interface</i> <count <i>requests</i> > <end-to-end   segment> <interval <i>seconds</i> > <sequence-number <i>number</i> > <brief>
<b>Description</b>	Check the reachability of a remote ATM node. All packets are 53 bytes.  Type Control-C to interrupt a ping atm command.
<b>Options</b>	<p>brief—(Optional) Display only the ATM ping summary statistics. These are displayed after you type Control-C to interrupt the ping atm command.</p> <p>count <i>requests</i>—(Optional) Number of ping requests to send.  <b>Range:</b> 0 through 10,000  <b>Default:</b> No limit to the number of requests sent. Type Control-C to interrupt a ping command.</p> <p>end-to-end—(Optional) Cells are sent to the end node. This is the default.</p> <p>interface <i>interface</i>—Interface to use to send the ATM ping requests.</p> <p>interval <i>seconds</i>—(Optional) How often to send ping requests.  <b>Range:</b> 0.1 through 10,000 seconds  <b>Default:</b> 1 second</p> <p>segment—(Optional) Cells are sent only to the intermediate node.</p> <p>sequence-number <i>number</i>—(Optional) Starting sequence number (correlation tag).  <b>Range:</b> 0 through 65468 bytes  <b>Default:</b> 1</p>
<b>Required Privilege Level</b>	network
<b>Sample Output</b>	<pre>user@host&gt; ping atm vci 0.128 interface at-5/3/0 53 byte oam cell received on (vpi=0 vci=128): seq=1 53 byte oam cell received on (vpi=0 vci=128): seq=2 53 byte oam cell received on (vpi=0 vci=128): seq=3 53 byte oam cell received on (vpi=0 vci=128): seq=4 53 byte oam cell received on (vpi=0 vci=128): seq=5 ^C[abort] --- atmping statistics --- 5 cells transmitted, 5 cells received, 0% cell loss  user@host&gt; ping atm vci 0.128 interface at-5/3/0 brief ^C[abort] --- atmping statistics --- 9 cells transmitted, 9 cells received, 0% cell loss</pre>

## quit

<b>Syntax</b>	quit
<b>Description</b>	Exit from the command-line interface (CLI). Issuing this command places you into a UNIX shell. To restart the CLI, type cli.
<b>Required Privilege Level</b>	Users with any privilege can issue this command.

## request message

**Syntax** request message all message *text*  
 request message message *text* (terminal *terminal-name* | user *user-name*)

**Description** Display a message on the screens of all users who are logged into the router or on specific screens.

**Options** all—Display a message on the terminal of all users who are currently logged in.

message *text*—Message to display.

terminal *terminal-name*—Name of the terminal on which to display the message.

user *user-name*—Name of the user to whom to direct the message.

**Required Privilege Level** maintenance

**Sample Output**

```
user@host> request message message "Maintenance window in 10 minutes" user
darius
Message from user@host on tty0 at 20:27 ...
Maintenance window in 10 minutes
EOF
```

## request support information

**Syntax** request support information

**Description** Display information about the system. You should issue this command before contacting customer support and then include the command output in your support request.

The output of this command is generally quite long, so you might want to redirect the output to a file.

This command is a combination of the following CLI operational mode commands:

show version

show chassis firmware

show chassis hardware

show chassis environment

show interfaces extensive for each configured interface

show configuration (excluding any SECRET-DATA)

**Required Privilege Level** maintenance

**Sample Output**

```
user@host> request support information | save filename
Wrote 1143 lines of output to 'filename'
user@host>
```

## request system halt

**Syntax** request system halt <at *time*> <in *minutes*> <message "*text*">

**Description** Stop the router software.

**Options** at *time*—(Optional) Time at which to stop the software. You can specify time in one of the following ways:

now—Stop the software immediately. This is the default.

+*minutes*—Number of minutes from now to stop the software.

*yymmddhhmm*—Absolute time at which to stop the software, specified as the year, month, day, hour, and minute.

*hh:mm*—Absolute time on the current day at which to stop the software, specified as the two-digit hour and two-digit minute.

in *minutes*—(Optional) Number of minutes from now to stop the software. This option is an alias for the at +*minutes* option.

message "*text*"—(Optional) Message to display to all system users before stopping the software.

**Default:** at now (stop the software immediately)

**Required Privilege Level** maintenance

**Examples** Assume that it is currently 5 p.m.

Stop the system in two hours (at 7 p.m.):

```
request system halt at +120
request system halt in 120
request system halt at 19:00
```

Stop the system immediately:

```
request system halt at now
```

Stop the system at 1:20 a.m. Because 1:20 a.m. is the next day, you must specify the absolute time.

```
request system halt at yymmdd120
request system halt at 120
Halt the system at 120? [yes,no] (no) yes
```

**Sample Output**

```
user@host> request system halt
Halt the system ? [yes,no] (no) yes
*** FINAL System shutdown message from root@lab8 ***
System going down IMMEDIATELY
Terminated
...
syncing disks... 11 8 done

The operating system has halted.
Please press any key to reboot.
```

## request system reboot

**Syntax** request system reboot <at *time*> <in *minutes*> <message "*text*">

**Description** Reboot the software.

Reboot requests are recorded to the system log files, which you can view with the show log command. Also, the names of any running processes that are scheduled to be shut down are changed. You can view the process names with the show system processes command.

**Options** at *time*—(Optional) Time at which to reboot the software. You can specify time in one of the following ways:

*now*—Stop or reboot the software immediately. This is the default.

*+minutes*—Number of minutes from now to reboot the software.

*yymmddhhmm*—Absolute time at which to reboot the software, specified as the year, month, day, hour, and minute.

*hh:mm*—Absolute time on the current day at which to stop the software, specified as the two-digit hour and two-digit minute.

in *minutes*—(Optional) Number of minutes from now to reboot the software. This option is an alias for the at *+minutes* option.

message "*text*"—(Optional) Message to display to all system users before stopping or rebooting the software.

**Default:** at now (reboot the system immediately)

**Required Privilege Level** maintenance

**See Also** clear system reboot on page 44

**Examples** Assume that it is currently 5 p.m.

Reboot the system in two hours (at 7 p.m.):

```
request system reboot at +120
request system reboot in 120
request system reboot at 19:00
```

Reboot the system immediately:

```
request system reboot at now
```

Reboot the system at 1:20 a.m. Because 1:20 a.m. is the next day, you must specify the absolute time.

```
request system reboot at yymmdd120
request system reboot at 120
Reboot the system at 120? [yes,no] (no) yes
```

```

Sample Output user@host> request system reboot
Reboot the system ? [yes,no] (no)
user@host>
user@host> request system reboot at 2300 message "Maintenance time!"
Reboot the system ? [yes,no] (no) yes
shutdown: [pid 186]
*** System shutdown message from root@berry.network.net ***
System going down at 23:00

```

## request system snapshot

**Syntax** request system snapshot

**Description** Back up the currently running and active file system partitions on the router to standby partitions that are not running. Specifically, the root file system (/) is backed up to /altroot and /config is backed up to /altconfig. Normally, the root and /config file systems are on the router's flash drive, and the /altroot and /altconfig file systems are on the router's hard drive.



**Note**

Prior to upgrading the software on the router, when you have a known stable system, you should consider issuing the request system snapshot command to back up the software onto the /altroot and /altconfig file systems.

After you have upgraded the software on the router and are satisfied that the new packages are successfully installed and running, you should consider issuing the request system snapshot command to back up the new software onto the /altroot and /altconfig file systems. After you run this command, you cannot return to the previous version of the software, because the running and backup copies of the software are identical.

**Required Privilege Level** maintenance

## request system software

**Syntax** request system software

**Description** Install or remove a software bundle or package from the router.

For complete instructions on upgrading the software, see *JUNOS Internet Software Configuration Guide: Installation and System Management*.



**Note**

Prior to upgrading the software on the router, when you have a known stable system, you should consider issuing the request system snapshot command to back up the software onto the /altroot and /altconfig file systems.

If you are upgrading more than one package at the same time, delete the operating system package, jkernel, last, and add the operating system package, jkernel, first and the routing software package, jroute, last. If you are upgrading all packages at once, delete and add them in the following order:

```
user@host> request system software delete jroute
user@host> request system software delete jdocs
user@host> request system software delete jpfe
user@host> request system software delete jkernel
user@host> request system software add /var/tmp/jkernel-release.tgz
user@host> request system software add /var/tmp/jpfe-release.tgz
user@host> request system software add /var/tmp/jdocs-release.tgz
user@host> request system software add /var/tmp/jroute-release.tgz
```

**Required Privilege Level** maintenance

**See Also** request system software add on page 54, request system software delete on page 55

## request system software add

**Syntax** request system software add <package-name> <no-copy> <delay-restart>  
<reboot>

**Description** Install a software bundle or package to the router.

**Options** delay-restart—Install software bundle or package but do not restart daemons.

no-copy—Install software bundle or package but do not save copies of package files.

package-name—Name of the software bundle or package to install or remove. Specify the filename as described in “How to Specify Filenames and URLs” on page 43.

reboot—After adding the software bundle or package, reboot the system.

**Required Privilege Level** maintenance

**Sample Output** The following is an example of loading a file from Routing Engine 0 to Routing Engine 1:

```
user@host> request system software add re(0|1):/<filename>
```

## request system software delete

**Syntax** request system software delete <package-name> <jdocs | jkernel | jpfe | jroute | junos>

**Description** Remove a software bundle or package from the router.

**Options** jdocs—JUNOS online documentation file.

jkernel—JUNOS kernel software suite.

jpfe—JUNOS packet forwarding engine support.

jroute—JUNOS routing software suite.

junos—JUNOS base software.

<package-name>—Name of the software bundle or package to install or remove. Specify the filename as described in “How to Specify Filenames and URLs” on page 43.

**Required Privilege Level** maintenance

## restart

**Syntax** restart (interface-control | mib-process | routing | snmp) <soft>

**Description** Restart a JUNOS software process.

**Options** interface-control—Restart the interfaces process, which controls the router physical interface devices and logical interfaces.

mib-process—Restart the MIB II process, which provides the router’s MIB II agent.

routing—Restart the routing protocol process, which controls the routing protocols that run on the router and maintains the routing tables.

snmp—Restart the SNMP process, which provides the router’s SNMP master agent.

soft—(Optional) Reread and reactivate the configuration without completely restarting the software processes. For example, BTP peers stay up and the routing table stays constant. This option is the equivalent of a UNIX SIGHUP signal; omitting this option is the equivalent of a UNIX SIGTERM (kill) operation.



**Note**

Never restart any of the software processes unless instructed to do so by a customer support engineer.

**Required Privilege Level** reset

**Sample Output**

```
user@host> restart interfaces
interfaces process terminated
interfaces process restarted
user@host>
```

• show arp

• **Syntax** show arp <no-resolve>

• **Description** Display the entries in the ARP table.

• **Options** no-resolve—(Optional) Do not attempt to determine the host name that corresponds to the IP address.

• **Required Privilege Level** view

• **Sample Output**

```
user@host> show arp
MAC Address      Address      Name          Flags
00:00:0c:06:2c:0d 192.168.1.2  firewall.my.net
```

## show cli authorization

<b>Syntax</b>	show cli authorization
<b>Description</b>	Display the permissions for the current user.
<b>Required Privilege Level</b>	view

**Sample Output**

```

user@host> show cli authorization
Current user: 'boojum' class 'super-user'
Permissions:
  admin          -- Can view user accounts
  admin-control  -- Can modify user accounts
  clear          -- Can clear learned network information
  configure      -- Can enter configuration mode
  control        -- Can modify any config
  edit           -- Can edit full files
  field          -- Special for field (debug) support
  floppy        -- Can read and write from the floppy
  interface      -- Can view interface config
  interface-control -- Can modify interface config
  network        -- Can access the network
  reset          -- Can reset/restart interfaces and daemons
  routing        -- Can view routing config
  routing-control -- Can modify routing config
  shell          -- Can start a local shell
  snmp           -- Can view SNMP config
  snmp-control   -- Can modify SNMP config
  system         -- Can view system config
  system-control -- Can modify system config
  trace          -- Can view trace file settings
  trace-control  -- Can modify trace file settings
  view           -- Can view current values and statistics
  maintenance    -- Can become the super-user
  firewall       -- Can view firewall config
  firewall-control -- Can modify firewall config
  secret         -- Can view secret config
  secret-control -- Can modify secret config

root@host> show cli authorization
Current user: 'root' login: 'boojum' class '(root)'
Permissions:
  admin          -- Can view user accounts
  admin-control  -- Can modify user accounts
  clear          -- Can clear learned network information
  configure      -- Can enter configuration mode
  control        -- Can modify any config
  edit           -- Can edit full files
  field          -- Special for field (debug) support
  floppy        -- Can read and write from the floppy
  interface      -- Can view interface config
  interface-control -- Can modify interface config
  network        -- Can access the network
  reset          -- Can reset/restart interfaces and daemons
  routing        -- Can view routing config
  routing-control -- Can modify routing config
  shell          -- Can start a local shell
  snmp           -- Can view SNMP config
  snmp-control   -- Can modify SNMP config
  system         -- Can view system config
  system-control -- Can modify system config
  trace          -- Can view trace file settings

```

```

trace-control      -- Can modify trace file settings
view               -- Can view current values and statistics
maintenance       -- Can become the super-user
firewall           -- Can view firewall config
firewall-control  -- Can modify firewall config
secret             -- Can view secret config
secret-control    -- Can modify secret config
    
```

## show cli history

**Syntax** show cli history <count>

**Description** Display list of previous CLI commands

**Options** *count*—Maximum number of commands to display.

**Required Privilege Level** view

## show configuration

**Syntax** show configuration

**Description** Display the configuration that currently is running on the router, which is the last committed configuration. If you have modified the configuration since you last committed it, the configuration information displayed by show configuration command will be different from that displayed by issuing the show command from the [edit] hierarchy level in configuration mode.

The portions of the configuration that you are allowed to see depend on the user class you are a member of and the permissions that the user class has. If you do not have permission to view a portion of the configuration, the text ACCESS-DENIED is substituted in that portion of the configuration. If you do not have permission to view authentication keys and passwords in the configuration (that is, if the secret permission bit is not set for your user account), the text SECRET-DATA is substituted in that portion of the configuration.

If an identifier in the configuration contains a space, the identifier is shown in quotation marks when it is displayed.

**Required Privilege Level** view

```

Sample Output user@host> show configuration
system {
    host-name lab8;
    domain-name juniper.net;
    backup-router 192.1.1.254;
    time-zone America/Los_Angeles;
    debugger-on-panic;
    debugger-on-break;
    default-address-selection;
    dump-on-panic;
    name-server {
        192.154.169.254;
        192.154.169.249;
        192.154.169.176;
    }
    services {
        telnet;
    }
    tacplus-server {
        1.2.3.4 {
            secret /* SECRET-DATA */;
            ...
        }
    }
}
interfaces {
    ...
}
protocols {
    isis {
        export "direct routes";
    }
}
policy-options {
    policy-statement "direct routes" {
        from protocol direct;
        then accept;
    }
}

user@host>

```

## show host

**Syntax** `show host host-name`

**Description** Display DNS host name information about a particular host.

**Options** *host-name*—Host name or address.

**Required Privilege Level** view

```

Sample Output user@host> show host snark
snark.boojum.net has address 192.168.1.254
user@host> show host 192.168.1.254
Name: snark.boojum.net
Address: 192.168.1.254
Aliases:

```

## show log

**Syntax** show log <user <user-name>> <filename>

**Description** List log files, display log file contents, and display information about users who have logged into the router.

**Options** none—List all log files.

*filename*—(Optional) Display the log messages in the specified log file.

*user <user-name>*—(Optional) Display logging information about users who have recently logged into the router. If you include *user-name*, display logging information about the specified user.

**Required Privilege Level** trace

**Sample Output** user@host> show log

```
total 57518
-rw-r--r-- 1 root bin 211663 Oct 1 19:44 dcd
-rw-r--r-- 1 root bin 999947 Oct 1 19:41 dcd.0
-rw-r--r-- 1 root bin 999994 Oct 1 17:48 dcd.1
-rw-r--r-- 1 root bin 238815 Oct 1 19:44 rpd
-rw-r--r-- 1 root bin 1049098 Oct 1 18:00 rpd.0
-rw-r--r-- 1 root bin 1061095 Oct 1 12:13 rpd.1
-rw-r--r-- 1 root bin 1052026 Oct 1 06:08 rpd.2
-rw-r--r-- 1 root bin 1056309 Sep 30 18:21 rpd.3
-rw-r--r-- 1 root bin 1056371 Sep 30 14:36 rpd.4
-rw-r--r-- 1 root bin 1056301 Sep 30 10:50 rpd.5
-rw-r--r-- 1 root bin 1056350 Sep 30 07:04 rpd.6
-rw-r--r-- 1 root bin 1048876 Sep 30 03:21 rpd.7
-rw-rw-r-- 1 root bin 19656 Oct 1 19:37 wtmp
-rw-rw-r-- 1 root bin 27 Aug 26 18:00 wtmp.0.gz
-rw-rw-r-- 1 root bin 46 Aug 20 01:04 wtmp.1.gz
-rw-rw-r-- 1 root bin 63 Aug 19 18:28 wtmp.2.gz

user@host> show log rpd
Oct 1 18:00:18 trace_on: Tracing to "/var/log/rpd" started
Oct 1 18:00:18 EVENT <MTU> ds-5/2/0.0 index 24 <Broadcast PointToPoint
Multicast
Oct 1 18:00:18
Oct 1 18:00:19 KRT rcv len 56 V9 seq 148 op add Type route/if af 2 addr
13.13.13.21 nhop type local nhop 13.13.13.21
Oct 1 18:00:19 KRT rcv len 56 V9 seq 149 op add Type route/if af 2 addr
13.13.13.22 nhop type unicast nhop 13.13.13.22
Oct 1 18:00:19 KRT rcv len 48 V9 seq 150 op add Type ifaddr index 24 devindex
43
Oct 1 18:00:19 KRT rcv len 144 V9 seq 151 op chnge Type ifdev devindex 44
Oct 1 18:00:19 KRT rcv len 144 V9 seq 152 op chnge Type ifdev devindex 45
Oct 1 18:00:19 KRT rcv len 144 V9 seq 153 op chnge Type ifdev devindex 46
Oct 1 18:00:19 KRT rcv len 1272 V9 seq 154 op chnge Type ifdev devindex 47
...

user@host> show log user
darius mg2546 Thu Oct 1 19:37 still logged in
darius mg2529 Thu Oct 1 19:08 - 19:36 (00:28)
darius mg2518 Thu Oct 1 18:53 - 18:58 (00:04)
root mg1575 Wed Sep 30 18:39 - 18:41 (00:02)
root tty2 jun.berry.per Wed Sep 30 18:39 - 18:41 (00:02)
alex tty1 192.156.1.2 Wed Sep 30 01:03 - 01:22 (00:19)
...
```

## show ntp associations

**Syntax** show ntp associations

**Description** Display NTP peers and their state. This command is equivalent to the UNIX ntpq -c peers command.

**Required Privilege Level** view

**Output Fields**

- remote—Address or name of the remote NTP peer.
- refid—Reference identifier of the remote peer. If the reference identifier is not known, this field shows a value of 0.0.0.0.
- st—Stratum of the remote peer.
- t—Type of peer. It can be b (broadcast), l (local), m (multicast), or u (unicast).
- when—When the last packet from the peer was received.
- poll—Polling interval, in seconds.
- reach—Reachability register, in octal.
- delay—Current estimated delay of the peer, in seconds.
- offset—Current estimated offset of the peer, in seconds.
- disp—Current estimated dispersion of the peer, in seconds.
- Character in the left margin—Indicates the fate of the peer in the clock selection process. It can be one of the following:
  - space—Discarded because of a high stratum value or failed sanity checks.
  - x—Designated falsticker by the intersection algorithm.
  - . —Culled from the end of the candidate list.
  - —Discarded by the clustering algorithm.
  - +—Included in the final selection set.
  - #—Selected for synchronization, but distance exceeds maximum.
  - \*—Selected for synchronization.
  - o—Selected for synchronization, but pps signal is in use.

**Sample Output**

```
user@host> show ntp associations
  remote           refid          st t when poll reach  delay  offset  disp
=====
*wolfe-gw.junipe tick.ucla.edu    2 u  43  64  377   1.86   0.319  0.08
```

• show ntp status

• **Syntax** show ntp status

• **Description** Display the values of internal variables returned by NTP peers. This command is equivalent to the UNIX ntpq -c readlist command.

• **Required Privilege Level** view

• **Sample Output** user@host> **show ntp status**  
status=06f4 leap\_none, sync\_ntp, 15 events, event\_peer/strat\_chg  
system="FreeBSD", leap=00, stratum=4, rootdelay=7.90,  
rootdispersion=22.99, peer=23732, refid=olive-oyl.juniper.net,  
reftime=b97c36cf.bed61000 Wed, Aug 12 1998 15:44:15.745, poll=7,  
clock=b97c3715.ba307000 Wed, Aug 12 1998 15:45:25.727, phase=-0.283,  
freq=-23633.96, error=0.695

## show pfe fpc

<b>Syntax</b>	show pfe fpc <slot>
<b>Description</b>	Display statistics from a particular FPC slot.
<b>Options</b>	slot—(Optional) Slot number. It can be a value from 0 through 7.
<b>Required Privilege Level</b>	admin

**Sample Output**

```

user@host> show pfe fpc 1
FPC 1 status:
  Slot:                Present
  State:                Online
  Last State Change:   2000-01-10 18:12:27 UTC
  Uptime:              1d 03:31
  Failures:            0
  Pending:             0

PFE listener statistics:
  Open:                1
  Close:               0
  Sleep:               0
  Wakeup:              0
  Resync Request:     0
  Resync Done:         0
  Resync Fail:         0
  Resync Time:         0

PFE IPC statistics:
  type                TX Messages  RX messages
  -----
  Header              0              0
  Test                0              0
  Interface           2251           2219
  Chassis              0              0
  Boot                 0              0
  Next-hop            0              0
  Jtree                0              0
  Cprod               0              0
  Route               0              0
  Pfe                  0              1
  Dfw                  0              0
  Mastership          0              0
  Empty               0              0

PFE socket-buffer mbuf depth:
  bucket              count
  -----
  0                   52273
  1                    0
  2                    0
  ...
  21                   0

```

```

PFE socket-buffer bytes pending transmit:
bucket          count
-----
0                52273
1                 0
2                 0
3                 0
...
21                0
    
```

## show pfe next-hop

**Syntax** show pfe next-hop <interface> <sfm slot>

**Description** Display information about the packet forwarding engine next-hop.

**Options** interface—(Optional) Display Packet Forwarding Engine next-hop interface.

sfm slot—(Optional for systems with multiple Switching and Forwarding Modules only.)  
 Show the next hops for an SFM slot. slot can be a value from 0 through 3.

**Required Privilege Level** admin

**Sample Output** user@host> show pfe next-hop

```

SFM 0

Nexthop Info:
  ID      Type      Interface      Protocol      Encap      Next Hop Addr      MTU
  ----      -      -      -      -      -      -
  4        Mcast -              IPv4          -          0.0.0.0             0
  5         Bcast -              IPv4          -          -                   0
  7   Discard -              IPv4          -          -                   0
  8 MDiscard -              IPv4          -          -                   0
  9   Reject -              IPv4          -          -                   0
  13   Local -              IPv4          -          192.168.4.60        0
  14   Resolve fxp0.0         IPv4          Unspecified -                   0
  17   Local -              IPv4          -          127.0.0.1           0
  18   Unicast fxp0.0         IPv4          Unspecified 192.168.4.254       0
  21   Local -              IPv4          -          11.1.0.1            0
  22   Unicast at-0/1/0.0     IPv4          ATM SNAP    11.1.0.2            4482
  ...
  26   Unicast at-0/3/0.0     IPv4          ATM SNAP    10.3.0.2            4482

SFM 1
    
```

NextHop Info:						
ID	Type	Interface	Protocol	Encap	Next Hop Addr	MTU
4	Mcast	-	IPv4	-	0.0.0.0	0
5	Bcast	-	IPv4	-	-	0
7	Discard	-	IPv4	-	-	0
8	MDiscard	-	IPv4	-	-	0
9	Reject	-	IPv4	-	-	0
13	Local	-	IPv4	-	192.168.4.60	0
14	Resolve	fxp0.0	IPv4	Unspecified	-	0
17	Local	-	IPv4	-	127.0.0.1	0
18	Unicast	fxp0.0	IPv4	Unspecified	192.168.4.254	0
21	Local	-	IPv4	-	11.1.0.1	0
22	Unicast	at-0/1/0.0	IPv4	ATM SNAP	11.1.0.2	4482
23	Local	-	IPv4	-	10.2.0.1	0
24	Unicast	at-0/2/0.0	IPv4	ATM SNAP	10.2.0.2	4482
25	Local	-	IPv4	-	10.3.0.1	0
26	Unicast	at-0/3/0.0	IPv4	ATM SNAP	10.3.0.2	4482

## show pfe route

**Syntax** show pfe route <ip | mpls | statistics> <sfm slot> <summary>

**Description** Display the Packet Forwarding Engine routing table.

**Options** ip—(Optional) Display Packet Forwarding Engine IPv4 routes.

mpls—(Optional) Display Packet Forwarding Engine MPLS information.

sfm slot— (Optional for systems with multiple Switching and Forwarding Modules only.)  
Display routes for an SFM slot. slot can be a value from 0 through 3.

statistics—(Optional) Display Packet Forwarding Engine statistics.

summary—(Optional) Display summary of Packet Forwarding Engine information.

**Required Privilege Level** admin

• show pfe scb

• **Syntax** show pfe scb

• **Description** (M20 and M40 routers only.) Display information about the packet forwarding engine SCB.

• **Required Privilege Level** admin

• **Sample Output** user@host> **show pfe scb**

```
• SCB status:
•   Slot:                Present
•   State:                Online
•   Last State Change:   1999-02-05 11:02:36 UTC
•   Uptime:              1d 02:31
•   Failures:            0
•   Pending:             0
```

• PFE listener statistics:

```
•   Open:                1
•   Close:               0
•   Sleep:               1
•   Wakeup:              0
•   Resync Request:     1
•   Resync Done:        1
•   Resync Fail:        0
•   Resync Time:        0
```

• PFE IPC statistics:

type	TX Messages	RX messages
Header	0	0
Test	0	0
Interface	10715	10594
Chassis	0	0
Boot	0	0
Next-hop	8	0
Jtree	0	0
Cprod	0	0
Route	11	0
Pfe	1592	1593
Dfw	0	0
Mastership	0	0
Empty	0	0

• PFE socket-buffer mbuf depth:

bucket	count
0	5298
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	3
12	3
13	1
14	3

15	7
16	41
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
0	5298
1	0
2	0
3	0
4	2
5	3
6	1
7	1
8	1
9	6
10	44
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

## show pfe sfm

**Syntax** show pfe sfm <slot>

**Description** For systems with multiple Switching and Forwarding Modules only, display information about an SFM in the Packet Forwarding Engine SFM.

**Required Privilege Level** admin

**Sample Output**

```

user@host> show pfe sfm 1
SFM 1 status:
  Slot:                Offline
  State:                Init
  Last State Change:   2000-03-01 07:45:55 UTC
  Downtime:            17:47:29
  Failures:            167
  Pending:              0

PFE listener statistics:
  Open:                167
  Close:               167
  Sleep:               2
  Wakeup:              1
  Resync Request:     2
  Resync Done:         2
  Resync Fail:         0
  Resync Time:         1

PFE IPC statistics:
  type                TX Messages  RX messages
  -----
  Header              0              0
  Test                0              0
  Interface           0              0
  Chassis             0              0
  Boot                0              0
  Next-hop            0              0
  Jtree               0              0
  Cprod               0              0
  Route               0              0
  Pfe                 0              0
  Dfw                 0              0
  Mastership          0              0
  Empty               0              0

PFE socket-buffer mbuf depth:
  bucket              count
  -----
  0                    0
  1                    0
  2                    0
  3                    0
  4                    0
  5                    0
  6                    0
  7                    0
  8                    0
  9                    0
  10                   0
  11                   0
  12                   0
  13                   0

```

14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

PFE socket-buffer bytes pending transmit:

bucket	count
-----	-----
0	0
1	0
2	0
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
11	0
12	0
13	0
14	0
15	0
16	0
17	0
18	0
19	0
20	0
21	0

## show pfe statistics dma

**Syntax** show pfe statistics dma <sfm slot>

**Description** Display statistics about the Packet Forwarding Engine Direct Memory Access.

**Options** sfm slot— (Optional for systems with multiple Switching and Forwarding Modules only.)  
Display routes for an SFM slot. slot can be a value from 0 through 3.

**Required Privilege Level** admin

**Sample Output** user@host> show pfe statistics dma

DMA Statistics:

Name	Requests	Completed	Failed
Packet Read	905119	905119	0
Packet Write	943761	943761	0
Physical Read	0	0	0
Physical Write	0	0	0

DMA Errors:

Name	Write 0	Write 1	Read 0	Read 1
Illegal Bank	0	0	0	0
Address Range	0	0	0	0
ECC Error	0	0	0	0
PCI Retries	0	0	0	0
PCI Error	0	0	0	0

DMA Requests:

Requests available: 256, Requests used: 0

## show pfe statistics error

**Syntax** show pfe statistics error

**Description** Display statistics about the Packet Forwarding Engine errors.

**Required Privilege Level** admin

**Sample Output** user@host> show pfe statistics error

```
PFE error statistics:
      C chip    A1 chip    A2 chip
-----
          0          0          0 scan fail
          0          0        N/A A1<->C CRC error
          0        N/A          0 A2<->C CRC error
        N/A          0          0 A<->B CRC error

B chip slots:
      0          1          2          3
-----
          0          0          0          0 scan fail
          0          0          0          0 A1->B CRC error
          0          0          0          0 A2->B CRC error
          0          0          0          0 correctable ECC error
          0          0          0          0 uncorrectable ECC error
          0          0          0          0 multiple ECC errors
          0          0          0          0 B->HS link error
          0          0          0          0 A1->Bm error
          0          0          0          0 A2->Bo error
          0          0          0          0 write buffer overflow
          0          0          0          0 Bo FIFO sync error
          0          0          0          0 Bo FIFO size error
          0          0          0          0 Bo stream stuck error
          0          0          0          0 Bo SRAM parity error

          4          5          6          7
-----
          0          0          0          0 scan fail
          0          0          0          0 A1->B CRC error
          0          0          0          0 A2->B CRC error
          0          0          0          0 correctable ECC error
          0          0          0          0 uncorrectable ECC error
          0          0          0          0 multiple ECC errors
          0          0          0          0 B->HS link error
          0          0          0          0 A1->Bm error
          0          0          0          0 A2->Bo error
          0          0          0          0 write buffer overflow
          0          0          0          0 Bo FIFO sync error
          0          0          0          0 Bo FIFO size error
          0          0          0          0 Bo stream stuck error
          0          0          0          0 Bo SRAM parity error
```

## show pfe statistics ip

**Syntax** show pfe statistics ip <icmp | options> <sfm slot>

**Description** Display statistics about the Packet Forwarding Engine IP.

**Options** icmp—(Optional) Display Packet Forwarding Engine IP ICMP statistics.

options—(Optional) Display Packet Forwarding Engine IP options statistics.

sfm slot—(Optional) Show statistics for this SFM slot. slot can be a value from 0 through 3.

**Required Privilege Level** admin

**Sample Output**

```

user@host> show pfe statistics ip icmp
ICMP Statistics:
    0 requests
    0 network unreachable
    0 ttl expired
    0 ttl captured
    0 redirects
    0 mtu exceeded
    0 icmp/option handoffs

ICMP Errors:
    0 unknown unreachable
    0 unsupported ICMP type
    0 unprocessed redirects
    0 invalid ICMP type
    0 invalid protocol
    0 bad input interface
    0 throttled icmps
    0 runts

ICMP Discards:
    0 multicasts
    0 bad source addresses
    0 bad dest addresses
    0 IP fragments
    0 ICMP errors

User@host> show pfe statistics ip options
IP Option Values:
    LSRR/SSRR forwarding enabled

IP Option Statistics:
    0 loose source routes
    0 strict source routes
    0 record routes
    889382 router alerts
    0 other options

IP Option Errors:
    0 runts
    2 bad versions
    0 runt header lengths
    0 giant header lengths
    0 null frames
    0 bad option lengths
    0 duplicate options
    0 bad option pointers
    0 source route frames dropped

```

## show pfe statistics notification

**Syntax** show pfe statistics notification

**Description** Display statistics about the Packet Forwarding Engine notification.

**Required Privilege Level** admin

**Sample Output** user@host> **show pfe statistics notification**

```
PFE Notification statistics:
  919780 parsed
    0 aged
    0 corrupt
    0 illegal
    0 sample
    0 giants

PFE Notification Type statistics:
      Parsed      Input      Failed      Ignored
Illegal          0          0           0          0
Unclass       27636       27636          0          0
Option       891032       890999          33          0
Next-Hop        1112         1112           0          0
Discard          0           0           0          0
Sample           0           0           0          0
Redirect         0           0           0          0
DontFrag         0           0           0          0
```

## show pfe statistics pio

**Syntax** show pfe statistics pio

**Description** Display statistics about the Packet Forwarding Engine Polled I/O .

**Required Privilege Level** admin

**Sample Output** user@host> **show pfe statistics pio**

```
PIO Statistics:

8542732 PIO read requests
8542732 PIO read replies
 586193 PIO write requests
 586191 PIO write replies
    0 PIO error replies
    0 PIO bad requests
    0 PIO bad replies
    0 PIO bad address
    0 PIO extra replies
    0 PIO timeouts
```

## show pfe statistics traffic

**Syntax** show pfe statistics traffic

**Description** Display statistics about the Packet Forwarding Engine traffic.

**Required Privilege Level** admin

**Sample Output**

```

user@host> show pfe statistics traffic
PFE Traffic statistics:
    910485 packets input  (34 packets/sec)
    932724 packets output (37 packets/sec)

PFE Local Traffic statistics:
    894563 local packets input
    932757 local packets output
    0 software input high drops
    0 software input medium drops
    25 software input low drops
    0 software output drops
    0 hardware input drops

PFE Local Protocol statistics:
    2578 hdlc keepalives
    0 atm oam
    0 fr lmi
    5191 ppp lcp/ncp
    0 ospf hello
    21 isis iih

PFE Hardware Discard statistics:
    0 timeout
    0 truncated key
    0 bits to test
    0 data error
    0 stack underflow
    0 stack overflow
    2638 discard route
    0 illegal next hop
    
```

## show pfe terse

**Syntax** show pfe terse

**Description** Display information about the packet forwarding engine.

**Required Privilege Level** admin

**Sample Output**

```

user@host> show pfe terse
Slot Type Slot   State  Flags Uptime
  0  SFM  Present Online 0x0bf 01:25:42
  2  SFM  Present Online 0x0bf 01:25:40
  0  FPC  Present Online 0x102 01:25:57
  1  FPC  Present Online 0x102 01:25:55
  2  FPC  Present Online 0x102 01:25:53
    
```

## show system audit

**Syntax** show system audit <root-only>

**Description** Display the state and checksum values for all files in file systems. This command is equivalent to the UNIX `mtree -Kmd5digest -c -p` command.

To redirect the output to a file, you could issue the following command:

```
ssh router-name 'show system audit root-only' > output-file
```

If you save the output of the `show system audit root-only` command to a file, you can compare it to subsequent output from the command to determine whether anything has changed.

**Options** `root-only`—(Optional) Check only the root (`/`) file system. This command is equivalent to the UNIX `mtree -Kmd5digest -c -p -x` command.

**Required Privilege Level** admin

```
Sample Output user@host> show system audit root-only
#          user: root
#          machine: my-host
#          tree: /
date: Fri Feb 11 21:21:46 2000

# .
/set type=file uid=0 gid=0 mode=0755 nlink=1
.          type=dir nlink=23 size=1024 time=950252640.0
.         .cshrc      uid=3 gid=7 mode=0644 size=177 time=939182975.0 \
          md5digest=f414e06fea6bd646244b98e13d6e6226
.         .kernel.jkernel.backup \
          mode=0744 size=1934552 time=944688902.0 \
          md5digest=2c343cf0bd9fea8f04f78604feed7aa4
.         .profile    uid=3 gid=7 mode=0644 nlink=2 size=173 time=939182975.0 \
          md5digest=55a1e3c6c67789c9d3a1cce1ea39f670
COPYRIGHT uid=3 gid=7 mode=0444 size=3425 time=939182975.0 \
          md5digest=7df8bc77dcee71382ea73eb0ec6a9243
boot.config mode=0644 size=3 time=945902618.0 \
          md5digest=93d722493ed38477338a1405d7dcbb40
boot.help   uid=3 gid=7 mode=0444 size=411 time=939182876.0 \
          md5digest=9b7126385734bcae753f4179ab59d8e5
compat     type=link mode=0777 size=11 time=915149058.0 \
          link=/usr/compat
kernel     mode=0444 size=1947607 time=950230892.0 \
          md5digest=1a2a8aff2fec678a918ba0d6bf063980
kernel.avr uid=1112 size=1947642 time=950252597.0 \
          md5digest=82e1637682d58ec28964dfee7fccb62e
kernel.config \
          mode=0644 size=0 time=915149058.0 \
          md5digest=d41d8cd98f00b204e9800998ecf8427e
sys       type=link mode=0777 size=11 time=915149029.0 \
          link=usr/src/sys
```

## show system boot-messages

**Syntax** show system boot-messages

**Description** Display initial messages generated by the system kernel upon boot. This is the contents of /var/run/dmesg.boot.

**Required Privilege Level** view

**Sample Output**

```

user@host> show system boot-messages
Copyright (c) 1992-1998 FreeBSD Inc.
Copyright (c) 1996-2000 Juniper Networks, Inc.
All rights reserved.
Copyright (c) 1982, 1986, 1989, 1991, 1993
    The Regents of the University of California. All rights reserved.

JUNOS 4.1-20000216-Zf8469 #0: 2000-02-16 12:57:28 UTC
    tlim@single.juniper.net:/p/build/20000216-0905/4.1/release_kernel/sys/compil
e/GENERIC
CPU: Pentium Pro (332.55-MHz 686-class CPU)
    Origin = "GenuineIntel" Id = 0x66a Stepping=10
    Features=0x183f9ff<FPU,VME,DE,PSE,TSC,MSR,PAE,MCE,CX8,SEP,MTRR,PGE,MCA,CMOV,<b
16>,<b17>,MMX,<b24>>
Teknor CPU Card Recognized
real memory = 805306368 (786432K bytes)
avail memory = 786280448 (767852K bytes)
Probing for devices on PCI bus 0:
chip0 <generic PCI bridge (vendor=8086 device=7192 subclass=0)> rev 3 class 6000
0 on pci0:0:0
chip1 <Intel 82371AB PCI-ISA bridge> rev 1 class 60100 on pci0:7:0
chip2 <Intel 82371AB IDE interface> rev 1 class 10180 on pci0:7:1
chip3 <Intel 82371AB USB interface> rev 1 class c0300 int d irq 11 on pci0:7:2
smb0 <Intel 82371AB SMB controller> rev 1 class 68000 on pci0:7:3
pcic0 <TI PCI-1131 PCI-CardBus Bridge> rev 1 class 60700 int a irq 15 on pci0:13
:0
TI1131 PCI Config Reg: [pci only][FUNC0 pci int]
pcic1 <TI PCI-1131 PCI-CardBus Bridge> rev 1 class 60700 int b irq 12 on pci0:13
:1
TI1131 PCI Config Reg: [pci only][FUNC1 pci int]
fxp0 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 12 on
pci0:16:0
chip4 <generic PCI bridge (vendor=1011 device=0022 subclass=4)> rev 4 class 6040
0 on pci0:17:0
fxp1 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 10 on
pci0:19:0
Probing for devices on PCI bus 1:
mcs0 <Miscellaneous Control Subsystem> rev 12 class ff0000 int a irq 12 on pci1:
13:0
fxp2 <Intel EtherExpress Pro 10/100B Ethernet> rev 8 class 20000 int a irq 10 on
pci1:14:0
Probing for devices on the ISA bus:
sc0 at 0x60-0x6f irq 1 on motherboard
sc0: EGA color <16 virtual consoles, flags=0x0>
ed0 not found at 0x300
ed1 not found at 0x280
ed2 not found at 0x340
psm0 not found at 0x60
sio0 at 0x3f8-0x3ff irq 4 flags 0x20010 on isa
sio0: type 16550A, console
sio1 at 0x3e8-0x3ef irq 5 flags 0x20000 on isa
sio1: type 16550A
sio2 at 0x2f8-0x2ff irq 3 flags 0x20000 on isa

```

```

sio2: type 16550A
pcic0 at 0x3e0-0x3e1 on isa
PC-Card ctrlr(0) TI PCI-1131 [CardBus bridge mode] (5 mem & 2 I/O windows)
pcic0: slot 0 controller I/O address 0x3e0
npx0 flags 0x1 on motherboard
npx0: INT 16 interface
fdc0: direction bit not set
fdc0: cmd 3 failed at out byte 1 of 3
fdc0 not found at 0x3f0
wdc0 at 0x1f0-0x1f7 irq 14 on isa
wdc0: unit 0 (wd0): <SunDisk SDCFB-80>, single-sector-i/o
wd0: 76MB (156672 sectors), 612 cyls, 8 heads, 32 S/T, 512 B/S
wdc0: unit 1 (wd1): <IBM-DCXA-210000>
wd1: 8063MB (16514064 sectors), 16383 cyls, 16 heads, 63 S/T, 512 B/S
wdc1 not found at 0x170
wdc2 not found at 0x180
ep0 not found at 0x300
fxp0: Ethernet address 00:a0:a5:12:05:5a
fxp1: Ethernet address 00:a0:a5:12:05:59
fxp2: Ethernet address 02:00:00:00:00:01
swapon: adding /dev/wd1s1b as swap device
Automatic reboot in progress...
/dev/rwd0s1a: clean, 16599 free (95 frags, 2063 blocks, 0.1% fragmentation)
/dev/rwd0s1e: clean, 9233 free (9 frags, 1153 blocks, 0.1% fragmentation)
/dev/rwd0s1a: clean, 16599 free (95 frags, 2063 blocks, 0.1% fragmentation)
/dev/rwd1s1f: clean, 4301055 free (335 frags, 537590 blocks, 0.0% fragmentation)

```

## show system buffers

**Syntax** show system buffers

**Description** Display information about the buffer pool that the Routing Engine uses for local traffic, which is the routing and management traffic that is exchanged between the Routing Engine and the Packet Forwarding Engine within the router, as well as the routing and management traffic from IP (that is, from OSPF, BGP, SNMP, pings, and so on).

**Required Privilege Level** view

**Output Fields** mbufs in use—Memory buffers (mbufs) are 128-byte buffers that are used for various purposes inside the kernel. A special type of mbuf called a *cluster* is 2 KB in size. For more information, see *The Design and Implementation of the 4.4BSD Operation System* by McKusic, Bostic, Karels, and Quarterman. Each mbuf has a type, and the following lines itemize the amount allocated for each type. Types with no mbufs allocated are not displayed.

mbufs allocated to data—Number of mbufs allocated for miscellaneous purposes (basically, any purpose other than one of those below).

mbufs allocated to ancillary data—Number of mbufs currently holding nonpacket data being communicated between protocol layers.

mbufs allocated to packet headers—Number of mbufs currently holding packet headers.

mbufs allocated to protocol control blocks—Number of mbufs currently holding state for sockets.

mbufs allocated to fragment reassembly queue headers—Number of mbufs currently holding queue headers for IP fragment reassembly.

mbufs allocated to socket names and addresses—Number of mbufs currently holding addresses for sockets.

mbuf clusters in use—Allocation statistics for mbuf clusters.

allocated to network—Total amount of memory in use by the networking and IPC code.

requests for memory denied—Number of times a memory allocation request within the IPC and networking code failed.

requests for memory delayed—Number of times a memory allocation request within the IPC and networking code was postponed.

calls to protocol drain routines—Number of times a memory allocation request within the IPC and networking code triggered a memory reclamation attempt.

```

Sample Output user@host> show system buffers
                853 mbufs in use:
                2 mbufs allocated to packet headers
                37 mbufs allocated to protocol control blocks
                28 mbufs allocated to socket names and addresses
                2 mbufs allocated to socket send data
                400 mbufs allocated to pfe refill data
                384 mbufs allocated to fxp data
                784/944 mbuf clusters in use
                1994 Kbytes allocated to network (83% in use)
                0 requests for memory denied
                0 requests for memory delayed
                0 calls to protocol drain routines

```

## show system connections

**Syntax** show system connections <extensive>

**Description** Display information about the active IP sockets on the Routing Engine. Use this command to verify which servers are active on a system and what connections are currently in progress.

**Options** none—information about the active IP sockets on the Routing Engine. This option is equivalent to the UNIX netstat -an -f inet command.

extensive—(Optional) Display exhaustive system process information, which, for TCP connections, includes the TCP control block. This option is useful for debugging TCP connections. This option is equivalent to the UNIX netstat -Van -f inet command.

**Required Privilege Level** view

**Sample Output** Sample Output: show system connections on page 79  
Sample Output: show system connections extensive on page 80

**Output Fields** Protocol—Protocol of the socket. It can be either TCP or UDP.

Recv-Q—Number of input packets received by the protocol and waiting to be processed by the application.

Send-Q—Number of output packets sent by the application and waiting to be processed by the protocol.

Local Address—Local address and port of the socket, separated by a period. An asterisk (\*) indicates that the bound address is the wildcard address. Server sockets typically have the wildcard address and a well-known port bound to them.

Foreign Address—Foreign address and port of the socket, separated by a period. An asterisk (\*) indicates that the address or port is a wildcard.

(state)—For TCP, the protocol state of the socket.

```

Sample Output: show system connections user@host> show system connections
Active Internet connections (including servers)
Proto Recv-Q Send-Q Local Address      Foreign Address    (state)
tcp    0      2 192.168.4.16.513   208.197.169.254.894 ESTABLISHED
tcp    0      0 192.168.4.16.513   208.197.169.195.945 ESTABLISHED
tcp    0      0 *.*                *.*                LISTEN
tcp    0      0 *.22                *.*                LISTEN
tcp    0      0 *.513                *.*                LISTEN

```



## show system processes

**Syntax** show system processes <wide> <brief | detail | extensive | summary>

**Description** Display information about software processes that are running on the router and that have controlling terminals. These commands are equivalent to various UNIX ps and top commands.

**Options** none—Display information about system processes. This option is equivalent to the UNIX ps -ax command.

brief—(Optional) Display brief system process information, listing no processes themselves. This option is equivalent to the UNIX top -bSd1 0 command.

detail—(Optional) Display detailed system process information. This option is equivalent to the UNIX ps -ax -rOuid,ppid,cpu,pri,nice,rss,wchan,start command.

extensive—(Optional) Display exhaustive system process information. This option is equivalent to the UNIX top -bSld1 infinity command.

summary—(Optional) Display a summary of active system process information. This option is equivalent to the beginning of the UNIX top command.

wide—(Optional) Display process information that might be wider than 80 columns. This option is equivalent to the UNIX ps -ax -ww command.

**Required Privilege Level** view

**Sample Output** Sample Output: show system processes (standard) on page 85  
 Sample Output: show system processes brief on page 85  
 Sample Output: show system processes detail on page 86  
 Sample Output: show system processes summary on page 86  
 Sample Output: show system processes extensive on page 87

**Options at a Glance** Table 6 summarizes which information is included in the output of each of the show system processes command options. In this table, output fields are listed in alphabetical order. In the Output Fields section, the fields are listed in the order in which they are displayed

**Table 6: Show System Processes Output Field Summary**

Options	Field Description
Standard Summary Detail Extensive	COMMAND—Command that is running.
Detail	CPU—Short-term CPU usage.
Summary Extensive	CPU—Raw (unweighted) CPU usage. The value of this field is used to sort the processes in the output.
Brief Summary Extensive	last pid—Last process identifier assigned to the process.
Brief Summary Extensive	load averages—Three load averages followed by the current time.
Brief Summary Extensive	Mem—Information about physical and virtual memory allocation.
Detail Summary Extensive	NI or Nice—UNIX “nice” value.
Standard Summary Extensive	PID—Process identifier.
Detail	PPID—Parent process identifier.
Detail Summary Extensive	PRI—Current priority of the process.
Brief Summary Extensive	processes—Number of existing processes and the number of processes in each state (sleeping, running, starting, zombies, and stopped).
Summary Extensive	RES—Current amount of resident memory in KB.
Detail	RSS—Resident set size.
Summary Extensive	SIZE—Total size of the process (text, data, and stack) in KB.
Detail	STARTED—Time when the process started running, given in local time.
Standard Detail	STAT—Symbolic process state. The state is given by a sequence of letters.
Summary Extensive	STATE—Current state of the process (sleep, wait, run, idle, zombi, or stop).
Brief Summary Extensive	Swap—Information about physical and virtual memory allocation.
Standard Detail Extensive	TIME—Total amount of time that the command has been running.
Summary	TIME—Number of system and user CPU seconds that the process has used.
Standard Detail	TT—Control terminal name.
Detail	UID—User identifier.
Summary Extensive	USERNAME—Name of the process’ owner.
Detail	WCHAN—Symbolic name of the wait channel.
Summary Extensive	WCPU—Weighted CPU usage.

<b>Output Fields</b>	last pid—Last process identifier assigned to the process.
	load averages—Three load averages followed by the current time.
	processes—Number of existing processes and the number of processes in each state (sleeping, running, starting, zombies, and stopped).
	Mem—Information about physical and virtual memory allocation.
	Swap—Information about physical and virtual memory allocation.
	PID—Process identifier.
	TT—Control terminal name.
	STAT—Symbolic process state. The state is given by a sequence of letters. The first letter indicates the run state of the process:
	D—In disk or other short-term, uninterruptible wait
	I—Idle (sleeping longer than about 20 seconds)
	R—Runnable
	S—Sleeping for less than 20 seconds
	T—Stopped
	Z—Dead (zombie)
	Any additional characters indicate additional information:
	+—The process is in the foreground process group of its control terminal.
	< —The process has raised CPU scheduling priority.
	> —The process has specified a soft limit on memory requirements and is currently exceeding that limit; such a process is not swapped.
	A—The process has asked for random page replacement.
	E—The process is trying to exit.
	L—The process has pages locked in core.
	N—The process has reduced CPU scheduling priority.
	S—The process has asked for FIFO page replacement.
	s—The process is a session leader.
	V—The process is suspended during a vfork.
	W—The process is swapped out.
	X—The process is being traced or debugged.



**Sample Output: show  
system processes  
(standard)**

```
user@host> show system processes
PID  TT  STAT      TIME COMMAND
  0  ??? DLs      0:00.70 (swapper)
  1  ??? Is      0:00.35 /sbin/init --
  2  ??? DL      0:00.00 (pagedaemon)
  3  ??? DL      0:00.00 (vmdaemon)
  4  ??? DL      0:42.37 (update)
  5  ??? DL      0:00.00 (if_jnx)
 80  ??? Ss      0:14.66 syslogd -s
 96  ??? Is      0:00.01 portmap
128  ??? Is      0:02.70 cron
173  ??? Is      0:02.24 /usr/local/sbin/sshd (sshd1)
189  ??? S       0:03.80 /sbin/watchdog -t180
190  ??? I       0:00.03 /usr/sbin/tnetd -N
191  ??? S       2:24.76 /sbin/ifd -N
192  ??? S<      0:55.44 /usr/sbin/xntpd -N
195  ??? S       0:53.11 /usr/sbin/snmpd -N
196  ??? S       1:15.73 /usr/sbin/mib2d -N
198  ??? I       0:00.75 /usr/sbin/inetd -N
2677  ??? I       0:00.01 /usr/sbin/mgd -N
2712  ??? Ss      0:00.24 rlogind
2735  ??? R       0:00.00 /bin/ps -ax
1985  p0- S       0:07.41 ./rpd -N
2713  p0 Is      0:00.24 -tcsh (tcsh)
2726  p0 S+      0:00.07 cli
```

**Sample Output: show  
system processes brief**

```
user@host> show system processes brief
last pid: 543; load averages: 0.00, 0.00, 0.00 18:29:47
37 processes: 1 running, 36 sleeping

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free
```

**Sample Output: show system processes detail**

```

user@host> show system processes detail
PID  UID  PPID CPU PRI NI  RSS WCHAN  STARTED  TT  STAT  TIME COMMAND
3151 1049 3129  2  28  0  672 -        1:13PM  p0  R+   0:00.00 ps -ax -r
  1   0   0   0  10  0  376 wait   1:51PM  ??  Is   0:00.29 /sbin/ini
  2   0   0   0 -18  0   12 psleep 1:51PM  ??  DL   0:00.00 (pagedae
  3   0   0   0  28  0   12 psleep 1:51PM  ??  DL   0:00.00 (vmdaemo
  4   0   0   0  28  0   12 update 1:51PM  ??  DL   0:07.15 (update)
  5   0   0   0   2  0   12 pfesel  1:51PM  ??  IL   0:02.90 (if_pfe)
 27   0   1   0  10  0 17936 mfsidl  1:51PM  ??  Is   0:00.46 mfs /dev/
 81   0   1   0   2  0   496 select 1:52PM  ??  Ss   0:31.21 syslogd -
119   1   1   0   2  0   492 select 1:52PM  ??  Is   0:00.00 portmap
129   0   1   0  10  0   400 nfsidl 1:52PM  ??  I    0:02.15 nfsiod -n
130   0   1   0  10  0   400 nfsidl 1:52PM  ??  I    0:02.04 nfsiod -n
131   0   1   0  10  0   400 nfsidl 1:52PM  ??  I    0:00.01 nfsiod -n
132   0   1  48  10  0   400 nfsidl 1:52PM  ??  I    0:00.00 nfsiod -n
134   0   1   0   2  0   580 select 1:52PM  ??  S    0:02.95 amd -p -a
151   0   1   0  18  0   532 pause  1:52PM  ??  Is   0:00.34 cron
183   0   1   0   2  0   420 select 1:52PM  ??  Ss   0:00.07 /usr/loca
206   0   1   0  18  0    72 pause  1:52PM  ??  S    0:00.51 /sbin/wat
207   0   1   0   2  0   520 select 1:52PM  ??  I    0:00.16 /usr/sbin
208   0   1   0   2  0   536 select 1:52PM  ??  S    0:08.21 /sbin/dcd
210   0   1 255  2 -12  740 select 1:52PM  ??  S<   0:05.83 /usr/sbin
211   0   1   0   2  0   376 select 1:52PM  ??  S    0:00.03 /usr/sbin
215   0   1   0   2  0   548 select 1:52PM  ??  I    0:00.50 /usr/sbin
219   0   1   0   3  0   540 ttyin  1:52PM  v0  Is+  0:00.02 /usr/libe
220   0   1   0   3  0   540 ttyin  1:52PM  v1  Is+  0:00.01 /usr/libe
221   0   1   0   3  0   540 ttyin  1:52PM  v2  Is+  0:00.01 /usr/libe
222   0   1   0   3  0   540 ttyin  1:52PM  v3  Is+  0:00.01 /usr/libe
 735   0   1   0   2  0   468 select  2:47PM  ??  S    0:19.14 /usr/sbin
 736   0   1   0   2  0   212 select  2:47PM  ??  S    0:14.13 /usr/sbin
1380   0   1   0   3  0   888 ttyin   7:32PM  d0  Is+  0:00.46 bash
3019   0  207   0   2  0   636 select 10:49AM  ??  Ss   0:02.93 tnp.chass
3122   0 1380   0   2  0 1764 select 12:33PM  d0  S    0:00.77 ./rpd -N
3128   0  215   0   2  0   580 select 12:45PM  ??  Ss   0:00.12 rlogind
3129 1049 3128   0  18  0   944 pause 12:45PM  p0  Ss   0:00.14 -tcsh (tc
  0   0   0   0 -18  0    0 sched  1:51PM  ??  DLs  0:00.10 (swapper

```

**Sample Output: show system processes summary**

```

user@host> show system processes summary
last pid: 543; load averages: 0.00, 0.00, 0.00 18:29:47
37 processes: 1 running, 36 sleeping

Mem: 25M Active, 3976K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free

PID USERNAME PRI NICE SIZE RES STATE TIME WCPU CPU COMMAND
527 root 2 0 176K 580K select 0:00 0.04% 0.04% rlogind
543 root 30 0 604K 768K RUN 0:00 0.00% 0.00% top

```

**Sample Output: show system processes extensive**

```

user@host> show system processes extensive
last pid: 544; load averages: 0.00, 0.00, 0.00 18:30:33
37 processes: 1 running, 36 sleeping

Mem: 25M Active, 3968K Inact, 19M Wired, 8346K Buf, 202M Free
Swap: 528M Total, 64K Used, 528M Free

PID USERNAME PRI NICE SIZE RES STATE TIME WCPU CPU COMMAND
544 root 30 0 604K 768K RUN 0:00 0.00% 0.00% top
3 root 28 0 0K 12K psleep 0:00 0.00% 0.00% vmdaemon
4 root 28 0 0K 12K update 0:03 0.00% 0.00% update
528 aviva 18 0 660K 948K pause 0:00 0.00% 0.00% tcsh
204 root 18 0 300K 544K pause 0:00 0.00% 0.00% csh
131 root 18 0 332K 532K pause 0:00 0.00% 0.00% cron
186 root 18 0 196K 68K pause 0:00 0.00% 0.00% watchdog
27 root 10 0 512M 16288K mfsidl 0:00 0.00% 0.00% mount_mfs
112 root 10 0 148K 400K nfsidl 0:00 0.00% 0.00% nfsiod
110 root 10 0 148K 400K nfsidl 0:00 0.00% 0.00% nfsiod
111 root 10 0 148K 400K nfsidl 0:00 0.00% 0.00% nfsiod
109 root 10 0 148K 400K nfsidl 0:00 0.00% 0.00% nfsiod
1 root 10 0 620K 344K wait 0:00 0.00% 0.00% init
304 root 3 0 884K 900K ttyin 0:00 0.00% 0.00% bash
200 root 3 0 180K 540K ttyin 0:00 0.00% 0.00% getty
203 root 3 0 180K 540K ttyin 0:00 0.00% 0.00% getty
202 root 3 0 180K 540K ttyin 0:00 0.00% 0.00% getty
201 root 3 0 180K 540K ttyin 0:00 0.00% 0.00% getty
194 root 2 0 2248K 1640K select 0:11 0.00% 0.00% rpd
205 root 2 0 964K 800K select 0:12 0.00% 0.00% tnp.chassisd
189 root 2 -12 352K 740K select 0:03 0.00% 0.00% xntpd
114 root 2 0 296K 612K select 0:00 0.00% 0.00% amd
188 root 2 0 780K 600K select 0:00 0.00% 0.00% dcd
527 root 2 0 176K 580K select 0:00 0.00% 0.00% rlogind
195 root 2 0 212K 552K select 0:00 0.00% 0.00% inetd
187 root 2 0 192K 532K select 0:00 0.00% 0.00% tnetd
83 root 2 0 188K 520K select 0:00 0.00% 0.00% syslogd
538 root 2 0 1324K 516K select 0:00 0.00% 0.00% mgd
99 daemon 2 0 176K 492K select 0:00 0.00% 0.00% portmap
163 root 2 0 572K 420K select 0:00 0.00% 0.00% nsrexecd
192 root 2 0 560K 400K select 0:10 0.00% 0.00% snmpd
191 root 2 0 1284K 376K select 0:00 0.00% 0.00% mgd
537 aviva 2 0 636K 364K select 0:00 0.00% 0.00% cli
193 root 2 0 312K 204K select 0:07 0.00% 0.00% mib2d
5 root 2 0 0K 12K pfesel 0:00 0.00% 0.00% if_pfe
2 root -18 0 0K 12K psleep 0:00 0.00% 0.00% pagedaemon
0 root -18 0 0K 0K sched 0:00 0.00% 0.00% swapper

```

**show system reboot****Syntax** show system reboot**Description** Display any pending system reboots or halts.**Required Privilege Level** maintenance

**Sample Output** user@host> show system reboot  
reboot requested by root at Wed Feb 10 17:40:46 1999  
[process id 17885]

• show system software

• **Syntax** show system software <detail>

• **Description** Display loaded JUNOS extensions.

• **Options** detail—Display detailed information about available JUNOS extensions.

• **Required Privilege Level** maintenance

• show system statistics

• **Syntax** show system statistics <protocol>

• **Description** Display systemwide protocol-related statistics.

• **Options** *protocol*—(Optional) Name of a protocol:

• arp—Address Resolution Protocol

• cnl—Connectionless Network Layer

• esis—End System–Intermediate System

• icmp—Internet Control Message Protocol

• igmp—Internet Group Management Protocol

• ip—Internet Protocol

• mpls—Multiprotocol Label Switching

• rdp—Reliable Datagram Protocol

• tcp—Transmission Control Protocol

• tnp—Trivial Network Protocol

• tudp—Trivial User Datagram Protocol

• udp—User Datagram Protocol

• **Required Privilege Level** view

```

Sample Output user@host> show system statistics
ip:
    476559 total packets received
    0 bad header checksums
    0 with size smaller than minimum
    0 with data size < data length
    0 with header length < data size
    0 with data length < header length
    0 with bad options
    0 with incorrect version number
    0 fragments received
    0 fragments dropped (dup or out of space)
    0 fragments dropped after timeout
    0 packets reassembled ok
    406456 packets for this host
    39565 packets for unknown/unsupported protocol
    354 packets forwarded
    0 packets not forwardable
    0 redirects sent
    342678 packets sent from this host
    5 packets sent with fabricated ip header
    0 output packets dropped due to no bufs, etc.
    0 output packets discarded due to no route
    0 output datagrams fragmented
    0 fragments created
    0 datagrams that can't be fragmented

icmp: ...
tcp: ...
udp: ...
igmp: ...
arp: ...
clnl: ...
esis: ...

```

## show system storage

**Syntax** show system storage

**Description** Display statistics about the amount of free disk space in the router's file systems. Values are displayed in 1024-byte (1-KB) blocks. This command is equivalent to the UNIX `df -k` command.

**Required Privilege Level** view

**Sample Output**

```
user@host> show system storage
Filesystem      1K-blocks    Used    Avail Capacity  Mounted on
/dev/wd0s1a      68735      48766   14471    77%    /
/dev/wd2s1e       9247         1     8507     0%    /altconfig
/dev/wd2s1a      68735         1   63236     0%    /altroot
/dev/wd0s1e       9247         53    8455     1%    /config
/dev/wd2s1f     5505045  1538850  3525792   30%    /var
```

**Output Fields** Filesystem—Name of the file system. wd0 is the flash drive, wd2 is the hard drive, and wfd0 is the LS-120 floppy drive.

1K-blocks—Size of the file system in 1-KB blocks.

Used—Amount of space used in the file system, in blocks.

Avail—Amount of space available in the file system, in blocks.

Capacity—Percentage of the file system's space that is being used.

Mounted on—Directory to which the file system is mounted.

## show system uptime

<b>Syntax</b>	show system uptime
<b>Description</b>	Display the current time and information about how long the router, router software, and routing protocols have been running.
<b>Required Privilege Level</b>	view
<b>Output Fields</b>	<p>Current time—Current system time in UTC.</p> <p>System booted—Date and time when the router was last booted and how long it has been running.</p> <p>Protocols started—Date and time when the routing protocols were last started and how long they have been running.</p> <p>Last configured—Date and time when a configuration was last activated (either by booting the router or issuing the commit command in configuration mode).</p> <p><i>time</i>—Current time, in the local time zone.</p> <p><i>time</i> and <i>uptime</i>—How long the router has been operational.</p> <p>users—Number of users logged into the router.</p> <p>load averages—Load averages for the last 1 minute, 5 minutes, and 15 minutes.</p>
<b>Sample Output</b>	<pre>user@host&gt; show system uptime Current time:      1998-10-13 19:45:47 UTC System booted:    1998-10-12 20:51:41 UTC (22:54:06 ago) Protocols started: 1998-10-13 19:33:45 UTC (00:12:02 ago) Last configured:  1998-10-13 19:33:45 UTC (00:12:02 ago) 12:45PM up 22:54, 2 users, load averages: 0.07, 0.02, 0.01</pre>

## show system users

**Syntax** show system users <noresolve>

**Description** List information about the users who are currently logged into the router.

**Options** noresolve—(Optional) Do not attempt to resolve IP addresses to host names.

**Required Privilege Level** view

**Output Fields** *time* and *uptime*—Current time, in the local time zone, and how long the router has been operational.

*users*—Number of users logged into the router.

*load averages*—Load averages for the last 1 minute, 5 minutes, and 15 minutes.

*USER*—Username.

*TTY*—Terminal through which the user is logged in.

*FROM*—System from which the user has logged in. A hyphen indicates that the user is logged in through the console.

*LOGIN@*—Time when the user logged in.

*IDLE*—How long the user has been idle.

*WHAT*—Processes that the user is running.

**Sample Output**

```

user@host> show system users
 7:30PM up 4 days, 2:26, 2 users, load averages: 0.07, 0.02, 0.01
USER   TTY FROM           LOGIN@  IDLE WHAT
root   d0  -               Fri05PM 4days -csh (csh)
boojum p0  berry.juniper.net 7:30PM  - cli

```

## show task

<b>Syntax</b>	show task <task-name> <detail   summary> <io   memory <object>>
<b>Description</b>	List the routing, routing protocol, and interface tasks that are currently running.
<b>Options</b>	<p>detail—(Optional) Display detailed information about each running tasks.</p> <p>io—(Optional) Display task I/O statistics.</p> <p>memory &lt; object&gt; —(Optional) Display detailed information about the memory utilization of running tasks or about the memory utilization of a particular task.</p> <p>summary—(Optional) Display summary information about the running tasks.</p> <p>task-name—(Optional) Display detailed information about a particular running task.</p> <p><b>Default:</b> summary</p>
<b>Required Privilege Level</b>	view
<b>Sample Output</b>	<p>Sample Output: show task detail on page 94</p> <p>Sample Output: show task memory on page 94</p> <p>Sample Output: show task summary on page 94</p>
<b>Output Fields</b>	<p>Pri—Priority of the task. A lower number indicates a higher priority.</p> <p>Task Name—Name of the task.</p> <p>Pro—IP protocol number associated with the task.</p> <p>Port—TCP or UDP port number associated with the task.</p> <p>So—Socket number of the task.</p> <p>Flags—Flags for the task:</p> <ul style="list-style-type: none"> <li>Accept—Task is waiting for incoming connections.</li> <li>Connect—Task is waiting for a connection to complete.</li> <li>Delete—Task has been deleted and is being cleaned up.</li> <li>LowPrio—Task will be dispatched to read its socket after other, higher priority tasks.</li> </ul>

**Sample Output: show task detail**

```

user@host> show task detail
Task IF:
so-2/0/0.0
  Index: 8, State: <Up Broadcast PointToPoint Multicast> Change: <>
  0 metric, 2 up/down transitions, full-duplex
  Link layer: HDLC serial line Encapsulation: Cisco HDLC Bandwidth: 155Mbps
  ISO address (null)
    State: <Up Broadcast PointToPoint Multicast> Change: <>
    Preference 0 (120 down), metric 0, MTU 4470 bytes
  INET address 1.2.3.5
    State: <Up Broadcast PointToPoint Multicast Localup> Change: <>
    Preference 0 (120 down), metric 0, MTU 4470 bytes
    Local address: 1.2.3.4
    Destination: 1.2.3.5/32
  INET address (null)
    State: <Up Broadcast PointToPoint Multicast> Change: <>
    Preference 0 (120 down), metric 0, MTU 4470 bytes
...

```

**Sample Output: show task memory**

```

user@host> show task memory
Memory          Size (kB)  %Available  When
Currently In Use:    29417      3%         now
Maximum Ever Used:   33882      4%         00/02/11 22:07:03
Available:          756281     100%        now

```

**Sample Output: show task summary**

```

user@host> show task summary
Pri Task Name          Pro  Port  So  Flags
10 IF
15 LABEL
15 ISO
15 INET                7
20 Aggregate
20 RT
30 ICMP                1     9
39 ISIS I/O           12
40 IS-IS              10
40 BGP RT Background          <LowPrio>
40 BGP.0.0.0+179          179 15 <Accept LowPrio>
50 BGP_69.192.168.201.234+179 179 17 <LowPrio>
50 BGP_70.192.168.201.233+179 179 16 <LowPrio>
50 BGP_Group_69_153          <LowPrio>
50 BGP_Group_70_153          <LowPrio>
50 ASPaths
60 KRT                  255     1
60 Redirect
70 MGMT.local           14 <LowPrio>
70 MGMT_Listen. /var/run/rpd_mgmt 13 <Accept LowPrio>
70 SNMP Subagent. /var/run/sub_rpd.sock 8 <LowPrio>

```

## show version

<b>Syntax</b>	show version <brief   detail>
<b>Description</b>	Display the host name and version information about the software running on the router.
<b>Options</b>	<p>none—Display version information for the JUNOS software packages and the software for each software process.</p> <p>brief—(Optional) Display version information for the JUNOS software packages (that is, for the JUNOS, kernel, and Packet Forwarding Engine software).</p> <p>detail—(Optional) Display software version information for JUNOS and other software packages running on the router.</p>
<b>Required Privilege Level</b>	view
<b>Sample Output</b>	<p>Sample Output: show version on page 95</p> <p>Sample Output: show version brief on page 95</p> <p>Sample Output: show version detail on page 95</p>
<b>Sample Output: show version</b>	<pre> user@host&gt; show version Hostname: my-router.net Model: m40 JUNOS base [4.0B1] (Export restricted edition) JUNOS Kernel Software Suite [4.0-20000208-T17057] JUNOS Routing Software Suite [4.0-20000208-T17057] JUNOS Packet Forwarding Engine Support [4.0-20000208-T17057] JUNOS Online Documentation Files [4.0-20000208-T17057] KERNEL 4.0-20000208-T17057 #0 built by tlim on 2000-02-08 11:26:32 UTC MGD release 4.0I0 built by tlim on 2000-02-08 12:40:47 UTC CLI release 4.0I0 built by tlim on 2000-02-08 12:40:55 UTC CHASSISD release 4.0I0 built by tlim on 2000-02-08 11:32:57 UTC DCD release 4.0I0 built by tlim on 2000-02-08 11:27:11 UTC RPD release 4.0I0 built by tlim on 2000-02-08 12:34:57 UTC SNMPD release 4.0I0 built by tlim on 2000-02-08 11:29:14 UTC MIB2D release 4.0I0 built by tlim on 2000-02-08 11:29:32 UTC APSD release 4.0I0 built by tlim on 2000-02-08 11:31:30 UTC VRRPD release 4.0I0 built by tlim on 2000-02-08 11:31:43 UTC ALARMD release 4.0I0 built by tlim on 2000-02-08 11:32:27 UTC PFED release 4.0I0 built by tlim on 2000-02-08 11:34:30 UTC CRAFTD release 4.0I0 built by tlim on 2000-02-08 11:34:06 UTC SAMPLED release 4.0I0 built by tlim on 2000-02-08 11:35:22 UTC jkernel-dd release 4.0I0 built by tlim on 2000-02-08 11:16:51 UTC jroute-dd release 4.0I0 built by tlim on 2000-02-08 12:32:16 UTC </pre>
<b>Sample Output: show version brief</b>	<pre> user@host&gt; show version brief Hostname: my.router.net Hostname: viagra Model: m40 JUNOS base [4.0B1] (Export restricted edition) JUNOS Kernel Software Suite [4.0-20000208-T17057] JUNOS Routing Software Suite [4.0-20000208-T17057] JUNOS Packet Forwarding Engine Support [4.0-20000208-T17057] JUNOS Online Documentation Files [4.0-20000208-T17057] </pre>
<b>Sample Output: show version detail</b>	<pre> user@host&gt; show version detail Hostname: my.router.net Model: m40 JUNOS base [4.0B1] (Export restricted edition) JUNOS Kernel Software Suite [4.0-20000208-T17057] </pre>

```

JUNOS Routing Software Suite [4.0-20000208-T17057]
JUNOS Packet Forwarding Engine Support [4.0-20000208-T17057]
JUNOS Online Documentation Files [4.0-20000208-T17057]
KERNEL 4.0-20000208-T17057 #0 built by tlim on 2000-02-08 11:26:32 UTC
MGD release 4.0I0 built by tlim on 2000-02-08 12:40:47 UTC
CLI release 4.0I0 built by tlim on 2000-02-08 12:40:55 UTC
CHASSISD release 4.0I0 built by tlim on 2000-02-08 11:32:57 UTC
DCD release 4.0I0 built by tlim on 2000-02-08 11:27:11 UTC
RPD release 4.0I0 built by tlim on 2000-02-08 12:34:57 UTC
SNMPD release 4.0I0 built by tlim on 2000-02-08 11:29:14 UTC
MIB2D release 4.0I0 built by tlim on 2000-02-08 11:29:32 UTC
APSD release 4.0I0 built by tlim on 2000-02-08 11:31:30 UTC
VRRPD release 4.0I0 built by tlim on 2000-02-08 11:31:43 UTC
ALARMD release 4.0I0 built by tlim on 2000-02-08 11:32:27 UTC
PFED release 4.0I0 built by tlim on 2000-02-08 11:34:30 UTC
CRAFTD release 4.0I0 built by tlim on 2000-02-08 11:34:06 UTC
SAMPLED release 4.0I0 built by tlim on 2000-02-08 11:35:22 UTC
jkernel-dd release 4.0I0 built by tlim on 2000-02-08 11:16:51 UTC
jroute-dd release 4.0I0 built by tlim on 2000-02-08 12:32:16 UTC

```

## ssh

**Syntax** `ssh address`

**Description** Use the secure shell (SSH) program to open a connection between a the local router and a remote system and execute commands on the remote system. You can issue the `ssh` command from the JUNOS CLI to log into a remote system or from a remote system to log into the local router.

To open an SSH connection from a remote system to the router, use the `ssh` command on the remote system. When executing this command, you include one or more CLI commands by including them in quotation marks and separating the commands with semicolons:

```
ssh address 'cli-command1; cli-command2'
```

To configure an SSH key for your user account, use the authentication `ssh-rsa` statement at the [edit system login user *user-name*] hierarchy level, as described in the *JUNOS Internet Software Configuration Guide*.

**Options** `address`—Address of the remote system.

**Required Privilege Level** network

**Sample Output**

```

user@host> ssh berry
Host key not found from the list of known hosts.
Are you sure you want to continue connecting (yes/no)? yes
Host 'berry' added to the list of known hosts.
boojun@berry's password:
Last login: Sun Jun 21 10:43:42 1998 from junos-router
% ...
% exit
user@host>

```

## start

<b>Syntax</b>	start shell (csh   sh)
<b>Description</b>	Exit from the CLI environment and create a UNIX-level shell.  To return to the CLI, type <b>exit</b> from the shell.  When you are in the shell, the shell prompt has the following format. Note that there is a space after the %.  <i>username@hostname%</i>  An example of the prompt is:  <i>root@router%</i>
<b>Options</b>	csh—Create a UNIX C shell.  sh—Create a UNIX Bourne shell.
<b>Required Privilege Level</b>	shell and maintenance
<b>Sample Output</b>	<pre> user@host&gt; start shell csh % % exit username@hostname% start shell sh % % exit user@host&gt; </pre>

## telnet

<b>Syntax</b>	telnet <i>address</i> <8bit>< <i>port</i> >
<b>Description</b>	Open a Telnet session to a remote system.  Type Ctrl-] to escape from the Telnet session to the Telnet command level, and then type <b>quit</b> to exit from Telnet.
<b>Options</b>	<i>address</i> —Address of the remote system.  8bit—(Optional) Use an 8-bit data path  <i>port</i> —(Optional) Port number or service name on remote system.
<b>Required Privilege Level</b>	network
<b>Sample Output</b>	<pre> user@host&gt; telnet 192.154.1.254 Trying 192.154.169.254... Connected to berry.juniper.net. Escape character is '^]'. ttypa login: &lt;Control&gt;] telnet&gt; quit Connection closed. user@host&gt; </pre>

## test configuration

**Syntax** test configuration (*filename* | terminal)

**Description** Verify that the syntax of a configuration file is correct.

If the configuration contains any errors, a message is displayed to indicate the line number and column number in which the error was found.

**Options** *filename*—Name of the configuration file. Specify the filename as described in “How to Specify Filenames and URLs” on page 43.

*terminal*—Use the text you type at the terminal as input to the configuration. Type Ctrl-D to end terminal input.

**Required Privilege Level** view

**Sample Output**

```

user@host> test configuration terminal
[Type ^D to end input]
system {
    host-name foo;
    dead man walking;
    login;
}
terminal:3:(8) syntax error: dead
[edit system]
    'dead man walking;'
    syntax error
terminal:4:(11) statement must contain additional statements: ;
[edit system login]
    'login ;'
    statement must contain additional statements
configuration syntax failed

```

## tracert

**Syntax** `tracert address <gateway address> <tll value> <wait seconds> <noresolve>  
<source address> <tos value>`

**Description** Determine the route to a host.

**Options** *address*—IP address or name of a host.

*gateway address*—(Optional) Address of a router through which the route should transit.

*noresolve*—(Optional) Do not attempt to determine the host name that corresponds to the IP address.

*source address*—(Optional) IP address to use as the source address in outgoing packets.

*tos value*—(Optional) Value to include in the IP type of service field.  
**Range:** 0 through 255

*tll value*—(Optional) Maximum time-to-live value to include in the tracert request.  
**Range:** 0 through 128

*wait seconds*—(Optional) Maximum time to wait for a response to the tracert request.

**Required Privilege Level** network

**Sample Output**

```
user@host> tracert boojum
tracert to boojum.juniper.net (192.156.169.254), 30 hops max, 40 byte packets
 1  alice (192.168.1.254)  2.370 ms  2.853 ms  0.367 ms
 2  snark (192.168.255.250)  0.778 ms  2.937 ms  0.446 ms
 3  boojum (192.156.169.254)  7.737 ms  89.905 ms  0.834 ms

user@host> tracert boojum noresolve
tracert to boojum.juniper.net (192.156.169.254), 30 hops max, 40 byte packets
 1  192.168.1.254  0.458 ms  0.370 ms  0.365 ms
 2  192.168.255.250  0.474 ms  0.450 ms  0.444 ms
 3  192.156.169.254  0.931 ms  0.876 ms  0.862 ms
```

If tracert packets enter a MPLS LSP, the output includes MPLS header information:

```
user@host> tracert mpls1
tracert to 10.168.1.224 (10.168.1.224), 30 hops max, 40 byte packets
 1  mpls1-sr0.juniper.net (192.168.200.101)  0.555 ms  0.393 ms  0.367 ms
    MPLS Label=1024 CoS=0 TTL=1
 2  mpls5-lo0.juniper.net (10.168.1.224)  0.420 ms  0.394 ms  0.401 ms
```

