

## Chapter 2

# Getting Started: A Quick Tour of the CLI

As an introduction to the command-line interface (CLI), this chapter provides instructions for simple steps you take after installing software on the router. It shows you how to start the CLI, view the command hierarchy, and make small configuration changes. Detailed information about using the CLI appears in subsequent chapters.



**NOTE:** The instructions and examples in this book are based on sample M-series and T-series routers. You can use them as a guideline for entering commands on your own routers.

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## Before You Start

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Make sure your router hardware is set up and the JUNOS software is installed. You must have a direct console connection to the router or network access using SSH or Telnet. If your router is not set up, follow the installation instructions provided with your router before proceeding.

## Logging In

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Log in to the router and start the CLI:

1. Log in as **root**.

The root login account has superuser privileges, with access to all commands and statements.

2. Start the CLI:

```
root# cli
root@>
```

The `>` command prompt shows you are in operational mode. Later, when you enter configuration mode, the prompt will change to `#`.



**NOTE:** If you are using the root account for the first time on the router, remember that the router ships with no password required for root, but the first time you commit a configuration with JUNOS Release 7.6 software (or a later release), you must set a root password. Root access is not allowed over a telnet session. To enable root access over an SSH connection, you must configure the `system services ssh root-login allow` statement.

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## Displaying Commands

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The CLI includes several ways to get help about commands. This section shows some examples of how to get help.

- Type `?` to show the top-level commands available in operational mode.

```
root@> ?
Possible completions:
clear          Clear information in the system
configure      Manipulate software configuration information
diagnose       Invoke diagnose script
file           Perform file operations
help           Provide help information
monitor        Show real-time debugging information
mtrace         Trace multicast path from source to receiver
ping           Ping remote target
quit           Exit the management session
request        Make system-level requests
restart        Restart software process
set            Set CLI properties, date/time, craft interface message
show           Show system information
ssh            Start secure shell on another host
start          Start shell
telnet         Telnet to another host
test           Perform diagnostic debugging
traceroute     Trace route to remote host
```

- Type **file ?** to show all possible completions for the **file** command.

```

root@> file ?
Possible completions:
  <[Enter]>      Execute this command
  archive        Archives files from the system
  checksum       Calculate file checksum
  compare        Compare files
  copy           Copy files (local or remote)
  delete         Delete files from the system
  list           List file information
  rename         Rename files
  show           Show file contents
  source-address Local address to use in originating the connection
  |             Pipe through a command

```

- Type **file archive ?** to show all possible completions for the **file archive** command.

```

root@> file archive ?
Possible completions:
  compress       Compresses the archived file using GNU gzip (.tgz)
  destination    Name of created archive (URL, local, remote, or floppy)
  source         Path of directory to archive

```

For more information about getting help about commands and statements, see “Getting Online Help” on page 37.

## Checking Router Status

You can use `show` commands to check router status and monitor router activity.

To help you become familiar with `show` commands:

- Type `show ?` to display the list of `show` commands you can use to monitor the router:

```

root@> show ?
Possible completions:
accounting      Show accounting profiles and records
aps             Show Automatic Protection Switching information
arp            Show system Address Resolution Protocol table entries
as-path        Show table of known autonomous system paths
bfd            Show Bidirectional Forwarding Detection information
bgp            Show Border Gateway Protocol information
chassis        Show chassis information
class-of-service Show class-of-service (CoS) information
cli            Show command-line interface settings
configuration   Show current configuration
connections     Show circuit cross-connect connections
dvmrp          Show Distance Vector Multicast Routing Protocol info
dynamic-tunnels Show dynamic tunnel information information
esis           Show end system-to-intermediate system information
firewall       Show firewall information
helper         Show port-forwarding helper information
host           Show hostname information from domain name server
igmp           Show Internet Group Management Protocol information
ike            Show Internet Key Exchange information
ilmi           Show interim local management interface information
interfaces     Show interface information
ipsec          Show IP Security information
ipv6           Show IP version 6 information
isis           Show Intermediate System-to-Intermediate System info
l2circuit      Show Layer 2 circuit information
l2vpn          Show Layer 2 VPN information
lacp           Show Link Aggregation Control Protocol information
ldp            Show Label Distribution Protocol information
link-management Show link management information
llc2           Show LLC2 protocol related information
log            Show contents of log file
mld            Show multicast listener discovery information
mpls           Show Multiprotocol Label Switching information
msdp           Show Multicast Source Discovery Protocol information
multicast      Show multicast information
ntp            Show Network Time Protocol information
ospf           Show Open Shortest Path First information
ospf3          Show Open Shortest Path First version 3 information
passive-monitoring Show information about passive monitoring
pfe            Show Packet Forwarding Engine information
pgm            Show Pragmatic Generalized Multicast information
pim            Show Protocol Independent Multicast information
policer        Show interface policer counters and information
policy         Show policy information
ppp            Show PPP process information
rip            Show Routing Information Protocol information
ripng          Show Routing Information Protocol for IPv6 info
route          Show routing table information
rsvp           Show Resource Reservation Protocol information
sap            Show Session Announcement Protocol information
security       Show security information

```

```

services          Show services information
snmp              Show Simple Network Management Protocol information
system           Show system information
task             Show routing protocol per-task information
ted              Show Traffic Engineering Database information
version          Show software process revision levels
vpls             Show VPLS information
vrrp             Show Virtual Router Redundancy Protocol information

```

- Use the `show chassis routing-engine` command to view Routing Engine status:

```

root@> show chassis routing-engine
Routing Engine status:
Slot 0:
  Current state          Master
  Election priority      Master (default)
  Temperature            31 degrees C / 87 degrees F
  CPU temperature        32 degrees C / 89 degrees F
  DRAM                   768 MB
  Memory utilization     84 percent
  CPU utilization:
    User                 0 percent
    Background           0 percent
    Kernel               1 percent
    Interrupt            0 percent
    Idle                 99 percent
  Model                 RE-2.0
  Serial ID              b10000078c10d701
  Start time             2005-12-28 13:52:00 PST
  Uptime                 12 days, 3 hours, 44 minutes, 19 seconds
  Load averages:        1 minute  5 minute  15 minute
                       0.02      0.01    0.00

```

- Use the `show system storage` command to view available storage on the router:

```

root@> show system storage
Filesystem      Size      Used      Avail  Capacity  Mounted on
/dev/ad0s1a     78M       47M       25M    65%      /
devfs           16K       16K       0B    100%    /dev/
/dev/vn0        14M       14M       0B    100%
/packages/mnt/jbase
/dev/vn1        52M       52M       0B    100%
/packages/mnt/jkernel-8.3R1.0
/dev/vn2       10.0M    10.0M     0B    100%
/packages/mnt/jpfe-M40-8.3R1.0
/dev/vn3        2.5M     2.5M     0B    100%
/packages/mnt/jdocs-8.3R1.0
/dev/vn4        17M      17M      0B    100%
/packages/mnt/jroute-8.3R1.08.3R1.0
/dev/vn5        6.7M     6.7M     0B    100%
/packages/mnt/jcrypto-8.3R1.0
/dev/vn6        7.1M     7.1M     0B    100%
/packages/mnt/jpfe-common-8.3R1.0
mfs:136        1.5G     60K      1.4G    0%      /tmp
mfs:148        1.5G     1.2M    1.3G    0%      /mfs
/dev/ad0s1e     12M      26K      11M     0%      /config
procfs         4.0K     4.0K     0B    100%    /proc
/dev/ad1s1f     9.4G     1.1G     7.5G   13%     /var
/dev/vn7        5.5M     5.5M     0B    100%
/packages/mnt/jtools-8.3R1.0

```

## Configuring a User Account

---

This section describes how to log in with a root account and configure a new user account. You can configure an account for your own use or create a test account.

To configure a user account on the router:

1. Log in as root and enter configuration mode:

```
root@host> configure
[edit]
root@host#
```

The prompt in brackets ([edit]), also known as a *banner*, shows that you are in configuration edit mode, at the top of the hierarchy.

2. Change to the [edit system login] section of the configuration:

```
[edit]
root@host# edit system login

[edit system login]
root@host#
```

The prompt in brackets changes to [edit system login] to show you are at a new level in the hierarchy.

3. Now add a new user account:

```
[edit system login]
root@host# edit user nchen
```

This example adds an account `nchen` (for Nathan Chen), but you can use any account name.

4. Configure a full name for the account. If the name includes spaces, enclose the entire name in quotation marks (" "):

```
[edit system login user nchen]
root@host# set full-name "Nathan Chen"
```

5. Configure an account class. The account class sets the user access privileges for the account.

```
[edit system login user nchen]
root@host# set class super-user
```

6. Configure an authentication method and password for the account:

```
[edit system login user nchen]
root@host# set authentication plain-text-password
New password:
Retype new password:
```

When the new password prompt appears, enter a clear-text password that the system will encrypt, and then confirm the new password.

7. Commit the configuration:

```
[edit system login user nchen]
root@host# commit
commit complete
```

Configuration changes are not activated until you commit the configuration. If the commit is successful, a **commit complete** message appears.

8. Return to the top level of the configuration, and then exit:

```
[edit system login user nchen]
root@host# top

[edit]
root@host# exit
Exiting configuration mode
```

9. Log out of the router:

```
root@host> exit

% logout Connection closed.
```

10. To test your changes, log back in with the user account and password you just configured:

```
>
login: nchen
Password: <password>

– JUNOS 8.3-R1.1 built 2005-12-15 22:42:19 UTC
nchen@host>
```

When you log in, you should see the new username at the command prompt.

Congratulations! You have successfully used the CLI to view router status and perform a simple configuration change. Now you are ready to learn more about the CLI. See the remaining chapters of this book for details.

Alternatively, you can follow the instructions in “Configuring a Routing Protocol” on page 16 to create a more extensive configuration.



**NOTE:** For complete information about the commands to issue to configure your router, including examples, see the JUNOS software configuration guides.

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## Configuring a Routing Protocol

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This section describes how to configure an OSPF backbone area that has two SONET interfaces. You can use it as a starting point for configuring additional protocols at a later time.

The final configuration looks like this:

```
[edit]
protocols {
  ospf {
    area 0.0.0.0 {
      interface so-0/0/0 {
        hello-interval 5;
        dead-interval 20;
      }
      interface so-0/0/1 {
        hello-interval 5;
        dead-interval 20;
      }
    }
  }
}
```

### Shortcut

You can create this entire configuration with two commands:

```
[edit]
user@host# set protocols ospf area 0.0.0.0 interface so-0/0/0 hello-interval 5
dead-interval 20
[edit]
user@host# set protocols ospf area 0.0.0.0 interface so-0/0/1 hello-interval 5
dead-interval 20
```

### Longer Configuration Example

This section provides a longer example of creating the above OSPF configuration. In the process, it illustrates how to use the different features of the CLI.

1. Enter configuration mode by issuing the **configure** top-level command:

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

Notice that the prompt has changed to a pound sign (#) to indicate configuration mode.

2. To create the above configuration, you start by editing the `protocols ospf` statements:

```
[edit]
user@host# edit protocols ospf
[edit protocols ospf]
user@host#
```

3. Now add the OSPF area:

```
[edit protocols ospf]
user@host# edit area 0.0.0.0
[edit protocols ospf area 0.0.0.0]
user@host#
```

4. Add the first interface:

```
[edit protocols ospf area 0.0.0.0]
user@host# edit interface so0
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host#
```

You now have four nested statements.

5. Set the hello and dead intervals.

```
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host# set ?
Possible completions:
+ apply-groups          Groups from which to inherit configuration data
> authentication-key    Authentication key
  dead-interval         Dead interval (seconds)
  disable               Disable OSPF on this interface
  hello-interval        Hello interval (seconds)
  interface-type        Type of interface
  metric                Interface metric (1..65535)
> neighbor              NBMA neighbor
  passive               Do not run OSPF, but advertise it
  poll-interval         Poll interval for NBMA interfaces
  priority              Designated router priority
  retransmit-interval   Retransmission interval (seconds)
  transit-delay         Transit delay (seconds)
  transmit-interval     OSPF packet transmit interval (milliseconds)
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host# set hello-interval 5
user@host# set dead-interval 20
user@host#
```

6. You can see what is configured at the current level with the `show` command:

```
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host# show
hello-interval 5;
dead-interval 20;
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host#
```

7. You are finished at this level, so back up a level and take a look at what you have so far:

```
[edit protocols ospf area 0.0.0.0 interface so-0/0/0]
user@host# up
[edit protocols ospf area 0.0.0.0]
user@host# show
interface so-0/0/0 {
    hello-interval 5;
    dead-interval 20;
}
[edit protocols ospf area 0.0.0.0]
user@host#
```

The interface statement appears because you have moved to the area statement.

8. Add the second interface:

```
[edit protocols ospf area 0.0.0.0]
user@host# edit interface so-0/0/1
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# set hello-interval 5
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# set dead-interval 20
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# up
[edit protocols ospf area 0.0.0.0]
user@host# show
interface so-0/0/0 {
    hello-interval 5;
    dead-interval 20;
}
interface so-0/0/1 {
    hello-interval 5;
    dead-interval 20;
}
[edit protocols ospf area 0.0.0.0]
user@host#
```

9. Back up to the top level and see what you have:

```
[edit protocols ospf area 0.0.0.0]
user@host# top
[edit]
user@host# show
protocols {
  ospf {
    area 0.0.0.0 {
      interface so-0/0/0 {
        hello-interval 5;
        dead-interval 20;
      }
      interface so-0/0/1 {
        hello-interval 5;
        dead-interval 20;
      }
    }
  }
}
[edit]
user@host#
```

This configuration now contains the statements you want.

10. Before committing the configuration (and thereby activating it), verify that the configuration is correct:

```
[edit]
user@host# commit check
configuration check succeeds
[edit]
user@host#
```

11. Commit the configuration to activate it on the router:

```
[edit]
user@host# commit
commit complete
[edit]
user@host#
```

### ***Making Changes to the Routing Protocol Configuration***

Suppose you decide to use different dead and hello intervals on interface `so-0/0/1`. You can make changes to the configuration.

1. Go directly to the appropriate hierarchy level by typing the full hierarchy path to the statement you want to edit.

```

[edit]
user@host# edit protocols ospf area 0.0.0.0 interface so-0/0/1
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# show
hello-interval 5;
dead-interval 20;
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# set hello-interval 7
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# set dead-interval 28
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# top
[edit]
user@host# show
protocols {
  ospf {
    area 0.0.0.0 {
      interface so-0/0/0 {
        hello-interval 5;
        dead-interval 20;
      }
      interface so-0/0/1 {
        hello-interval 7;
        dead-interval 28;
      }
    }
  }
}
[edit]
user@host#

```

2. If you decide not to run OSPF on the first interface, delete the statement:

```

[edit]
user@host# edit protocols ospf area 0.0.0.0
[edit protocols ospf area 0.0.0.0]
user@host# delete interface so-0/0/0
[edit protocols ospf area 0.0.0.0]
user@host# top
[edit]
user@host# show
protocols {
  ospf {
    area 0.0.0.0 {
      interface so-0/0/1 {
        hello-interval 7;
        dead-interval 28;
      }
    }
  }
}
[edit]
user@host#

```

Everything inside the statement you deleted was deleted with it. You can also eliminate the entire OSPF configuration by simply entering `delete protocols ospf` while at the top level.

3. If you decide to use the default values for the hello and dead intervals on your remaining interface, but you want OSPF to run on that interface, delete the hello and dead interval timers:

```
[edit]
user@host# edit protocols ospf area 0.0.0.0 interface so-0/0/1
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# delete hello-interval
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# delete dead-interval
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# top
[edit]
user@host# show
protocols {
  ospf {
    area 0.0.0.0 {
      interface so-0/0/1;
    }
  }
}
[edit]
user@host#
```

You can set multiple statements at the same time as long as they are all part of the same hierarchy (the path of statements from the top inward, as well as one or more statements at the bottom of the hierarchy). This feature can reduce considerably the number of commands you must enter.

4. To go back to the original hello and dead interval timers on interface `so-0/0/1`, enter:

```
[edit]
user@host# edit protocols ospf area 0.0.0.0 interface so-0/0/1
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# set hello-interval 5 dead-interval 20
[edit protocols ospf area 0.0.0.0 interface so-0/0/1]
user@host# exit
[edit]
user@host# show
protocols {
  ospf {
    area 0.0.0.0 {
      interface so-0/0/1 {
        hello-interval 5;
        dead-interval 20;
      }
    }
  }
}
[edit]
user@host#
```

5. You also can re-create the other interface, as you had it before, with only a single entry:

```
[edit]
user@host# set protocols ospf area 0.0.0.0 interface so-0/0/1 hello-interval 5
dead-interval 20
[edit]
user@host# show
protocols {
  ospf {
    area 0.0.0.0 {
      interface so-0/0/0 {
        hello-interval 5;
        dead-interval 20;
      }
      interface so-0/0/1 {
        hello-interval 5;
        dead-interval 20;
      }
    }
  }
}
```

## Rolling Back Configuration Changes

---

This section shows how to use the `rollback` command to return to the most recently committed configuration. This command is useful if you make configuration changes and then decide not to keep the changes.

This example shows how to configure an SNMP health monitor on the router and then return to the most recently committed configuration that does not include the health monitor. When configured, the SNMP health monitor provides network management systems (NMS) with predefined monitoring for file system usage, CPU usage, and memory usage on the router.

1. Enter configuration mode:

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

2. Show the current configuration (if any) for SNMP:

```
[edit]
user@host# show snmp
```

No `snmp` statements appear. SNMP has not been configured on the router.

3. Configure the health monitor:

```
[edit]
user@host# set snmp health-monitor
```

4. Show the new configuration:

```
[edit]  
user@host# show snmp  
health-monitor;
```

The health monitor statement indicates that SNMP health monitoring is configured on the router.

5. Use the **rollback** configuration mode command to return to the most recently committed configuration:

```
[edit]  
user@host# rollback  
load complete
```

6. Show the configuration again to make sure your change is no longer present:

```
[edit]  
user@host# show snmp
```

No **snmp** configuration statements appear. The health monitor is no longer configured.

7. Use the **commit** command to activate the configuration to which you rolled back:

```
[edit]  
user@host# commit
```

8. Exit configuration mode:

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

You can also use the **rollback** command to return to earlier configurations. For more information, see “Managing Configurations” on page 117.

