

Chapter 2

Command-Line Interface

This chapter provides information about the E-series router command-line interface (CLI).

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Overview

The CLI is the interface to the software that you use whenever you access the router—whether from the console or through a remote network connection. The CLI, which automatically starts after the router finishes booting, provides commands that you use to perform various tasks, including configuring the JUNOS software and monitoring and troubleshooting the software, network connectivity, and the router hardware.

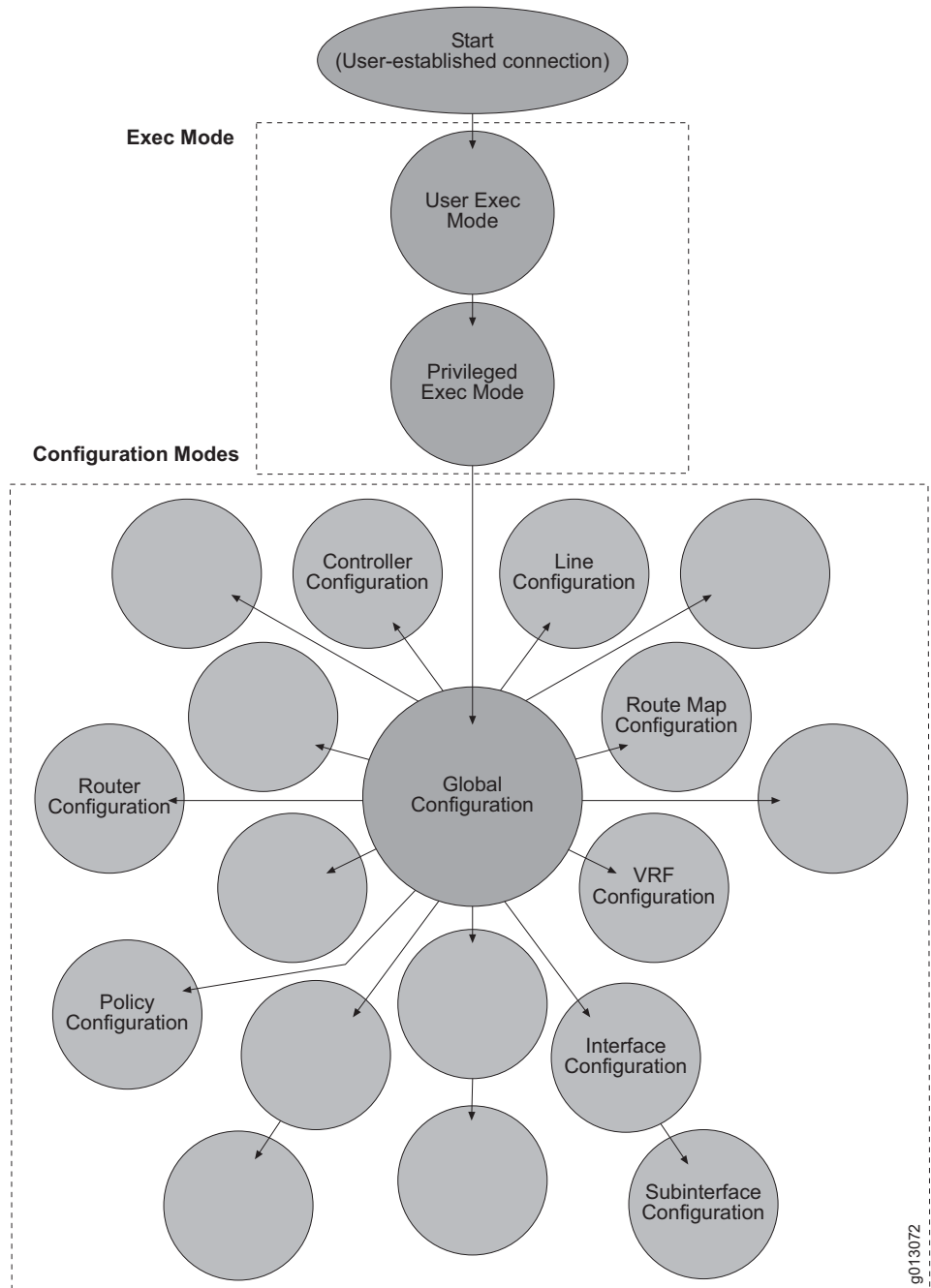
Managing your router using the CLI gives you access to thousands of commands. The router's CLI uses an industry *de facto* standard look and feel, which might be familiar to you. If you are new to this CLI, it is helpful to read this entire chapter, where you can learn about CLI shortcuts and other helpful information.

Command Modes

Command modes set a context for the CLI. Each command in the CLI is available from one or more command modes. From some command modes you can only view router information; from others you can perform configuration tasks. For example, you can access User Exec mode to display information and then access Global Configuration mode to set parameters or enable a particular feature. By recognizing the command-line prompt, you can identify where you are in the CLI at any given point. When you can easily identify where you are, it is easy to get to where you want to be.

Figure 21 on page 29 illustrates the command mode architecture. Only some of the many configuration modes are shown.

Command modes are discussed in greater detail in the section *Accessing Command Modes* on page 67. See the *JUNOS Command Reference Guide* to find related command modes for any command.

Figure 21: Command Mode Architecture

Command-Line Prompts

Within the CLI, the command-line prompt identifies both the *hostname* and the *command mode*. The hostname is the name of your router; the command mode indicates your location within the CLI system.

For example:

```
RX-01-01-01(config-router)#
```

hostname command mode privilege level --
 # indicates a privilege level > 1
 > indicates a privilege level of 0 or 1

Keywords and Parameters

CLI commands are made up of two primary elements: *keywords* and *parameters*.

Keywords

Every command requires at least one keyword; however, a command can contain other optional keywords. The keyword(s) must be typed into the CLI accurately for it to be recognized. These are examples of keywords:

```
reload
run
router
map-class
map-list
clear ip isis redistribution
show vlan subinterface
qos-port-type-profile
no rtr reset
radius calling-station-delimiter
```

You can abbreviate keywords; however, you must enter enough initial characters to unambiguously identify the command. For example, if the keyword you want to specify is **map-class** and you enter only **map-**, an error appears. The error indicates that one or more possible keywords begin with **map-**, thus making your entry ambiguous.

Parameters

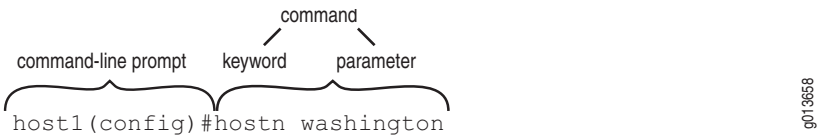
Parameters are often required elements of a command; however, for some commands, parameters are not required. A parameter is most often a value that you specify after the keyword. There are different types of parameters, such as strings, integers, or IP addresses.

The CLI indicates the type of parameter that you must enter. When you see a range of numbers or uppercase letters, it indicates that you must specify a value. For example:

CLI Parameter Placeholder or Range	Sample Parameter User Input
ROUTER[:VRF]	charlie:1234
INTERFACE	3/2:20/15
WORD	windtunnel
<0–4294967295>	5600
A.B.C.D	192.56.32.2

Keywords and Parameters Together

By combining keywords and parameters in the correct sequence, you can begin using the CLI to configure and monitor your router. For example, you could specify the command **hostname** to change the name of your router by entering a keyword and a parameter. You need to type only the portion of the keyword that makes it unambiguous, such as **hostn**. Here, the value of the parameter, which is the name you assign to the host, is a string of up to 64 characters.



When you enter this command, the new hostname appears in the prompt.



Another example is a command that requires you to enter a number from within a given range. The command **ip http port** requires that a value be entered for the *portNumber* parameter. The value of this parameter is a number in the range of 0–65535. For example, you could enter:

```
juniper(config)#ip http port 56789
```



NOTE: You can find detailed information about command syntax, with parameter values defined, in the *JUNOS Command Reference Guide*.

Using CLI Commands

This section introduces some useful shortcuts and command-related highlights. These include:

- Abbreviated Commands
- The ? Key
- Backspace or Delete Key
- Enter Key
- Tab Key
- Arrow Keys
- The **no** Version (**no** Commands)
- **run** and **do** Commands
- **show** Commands
- The --More-- Prompt
- Responding to Prompts

Abbreviated Commands

Remember, you can abbreviate keywords to save time if you enter at least enough leading characters to uniquely identify the desired keyword. For example:

```
host1(config-if)#ip re
```

This abbreviation is for the command **ip redirects**. The string **ip re** is enough information for the CLI to identify the command you are using. See the section *Using Help* on page 61 for additional information.

The ? Key

Use the ? key at any time to see all the choices you can enter next. For example:

```
host1(config)#router ?
  bgp  Configure the Border-Gateway Protocol (BGP)
  isis  Configure ISO IS-IS
  ospf  Configure the Open Shortest Path First protocol (OSPF)
  rip   Configure the Routing Information Protocol
host1(config)#router
```

When you enter the ? character, all available choices are displayed. The router again displays the command you typed. You then have to type in only the choice you want and press Enter.

A `<cr>` in the list of choices means that you can press Enter to execute the command. For example:

```
host1(config-if)#isis metric 40 level-2 ?
<cr>

host1(config-if)#isis metric 40 level-2
```



NOTE: If the list of options extends beyond one screen, the last line on your screen displays the `--More--` prompt. If you want to use the `?` character as part of a string, such as a hostname or a regular expression, you must enter the following key sequence: `Ctrl + v + ?`. Otherwise, the CLI considers the `?` to be a request for assistance in completing the command.

Backspace or Delete

Use either key to delete the character immediately preceding the cursor.

Enter

Always use this key to execute the command you entered.

Tab

Use this key to complete the current keyword. For example, if you entered a portion of a lengthy command, such as

```
host1(config)#class
```

and press Tab, the full name of the command appears:

```
host1(config)#classifier-list
```

Arrow Keys

Some terminals have arrow (or cursor) keys on their keyboards. These arrow keys are very useful; however, to use them you must have an ANSI/VT100 emulating terminal.

The Up Arrow and Down Arrow keys display command history. The Up Arrow key displays the previous command; you can also use `Ctrl + p`. The Down Arrow key displays the next command; you can also use `Ctrl + n`.

The Left Arrow and Right Arrow keys allow the user to move the cursor back and forth in the command line.

The no Version

With very few exceptions, every system configuration command has a **no** version, which you can use to negate a command (or a portion of it as specified by an optional keyword) or to restore its default setting. When you use a command *without* the keyword **no**, you can reenable a disabled feature or override a default setting.

You have the option of using the **default** keyword whenever the **no** keyword is also a choice; simply enter the keyword **default** instead of **no**.

In most cases, when you execute the **default** version of a command, it produces the exact results as the **no** version. There are some commands for which the **default** version yields a different result from the **no** version.

Commands for which the **default** behavior differs from the **no** behavior are clearly identified in the *JUNOS Command Reference Guide*. Unless otherwise specified, therefore, the **default** command is identical to the **no** command and is neither documented nor discussed.

The syntax for each **no** command is described in the *JUNOS Command Reference Guide*. The few system configuration commands that do not have a **no** version are indicated in the individual command description.

Because **show** commands are for the purpose of monitoring your configurations, they do not have **no** versions. Most User Exec and Privileged Exec mode commands do not have **no** versions.

The CLI can act on **no** versions of commands when you have entered sufficient information to distinguish the command syntactically; the CLI ignores all subsequent input on that line.

To be compatible with some non-Juniper Networks implementations, the **no** versions of commands will accept the same options as the affirmative version of the commands. The CLI ignores the optional input if it has no effect on the command behavior. If using the option changes the behavior of the **no** version, the individual command entry in this guide describes the difference in behavior.

run and do Commands

You can run Exec mode commands while in any configuration mode by preceding the command with the keyword **run** or **do**. For example:

```
host1(config)#run show users
```



NOTE: The **run** and **do** commands are interchangeable.

By using the **run** or **do** command in this way, you can obtain **show** command information without leaving configuration mode.

The only commands that cannot be preceded by **run** or **do** are the **configure** command and those commands that are already available in all modes, such as **sleep** or **exit**.

Example 1

```

host1(config)#run show config | begin interface
interface null 0
!
interface fastEthernet 0/0
  ip address 10.6.129.41 255.255.128.0
!
interface gigabitEthernet 5/0
!

interface atm 6/0
interface atm 6/0.1 point-to-point
  encapsulation pppoe
!
interface atm 6/0.1.7
!
interface atm 6/0.1.5
!
interface atm 6/0.1.2
!
interface atm 6/0.1.9
!
interface atm 6/0.1.11
!
interface atm 6/0.1.15
!
interface atm 6/0.1.18
!
ip route 0.0.0.0 0.0.0.0 10.6.128.1
ip route 10.10.121.72 255.255.255.255 10.6.128.1
!
!
route-map adsf permit 10
router dvmrp
!
router igmp
!
snmp-server community private view everything rw
snmp-server contact Mary
snmp-server
!
! End of generated configuration script.
host 1(config)#int fa 0/0

```

Example 2

```

host1(config-if)#do dir
Please wait...

```

file	size	unshared size	date (UTC)	in use
reboot.hty	31040	31040	10/30/2001 15:31:10	
system.log	20481	20481	10/26/2001 17:24:16	
soft_clear_in.mac	8578	8578	10/24/2001 14:39:02	
erx_3-3-1.rel	71082105	71082105	10/25/2001 13:02:50	!
erx_3-3-1.rel	70502991	70502991	10/24/2001 19:58:08	
autocfg.scr	355	355	09/28/2001 13:33:04	
Capacity = 224133120, Bytes Free = 44986177, Reserved = 36700160				

```

host1(config-if)#

```

show Commands

You have access to a variety of **show** commands that display router and protocol information. You can filter the output of a **show** command by specifying | (the UNIX pipe symbol), one of the following keywords, and either a case-sensitive text string or a regular expression.

- **begin**—Displays output beginning with the first line that contains the text string or regular expression
- **include**—Displays output lines that contain the text string or regular expression and excludes lines that do not contain the text string or regular expression
- **exclude**—Displays output lines that do not contain the text string or regular expression and excludes lines that do contain the text string or regular expression

For a list of regular expressions, see *Regular Expressions* on page 40. You can press Ctrl + c to interrupt the **show** command output.



NOTE: The system does not recognize beginning spaces of the text string. For example, if you enter **include IP** as the text string on which to filter, the system ignores the space and displays lines that include words such as RIP.

Example 1 In the following example, the output display starts with the first line that contains the string *inter*. The system omits all the preceding lines of the output from the display because none of them contains the string *inter*.

```
host1#show config include-defaults | begin inter
Please wait...log verbosity low internalNetwork
log verbosity low ipEngine
log verbosity low ipProfileMgr
log verbosity low ipProfileMgrEngineering
no log engineering
log fields timestamp instance no-calling-task
!
timing select primary
timing source primary internal
timing source secondary internal
timing source tertiary internal
!
no disable-autosync
no disable-switch-on-error
no redundancy lockout 0
!
virtual-router default
ip domain-lookup
ip name-server 10.2.0.3
ip domain-name 789df
!
host f 10.10.133.11 ftp anonymous null
interface null 0
interface ip 0/0
arp timeout 21600
!
interface ip 2/0
arp timeout 21600
```

```

!
interface ip s10
  arp timeout 21600
!
interface atm 2/0
  no shutdown
  atm sonet stm-1
  loopback line
  atm uni-version 3.0
  atm oam loopback-location 0xFFFFFFFF
  atm vc-per-vp 32768
  atm vp-tunnel 1 10
  load-interval 300
  no atm snmp trap link-status
  no atm shutdown
!
no atm aal5 snmp trap link-status
no atm aal5 shutdown
!
interface atm 2/0.1 point-to-point
  no shutdown
  no atm atm1483 shutdown
  no atm atm1483 snmp trap link-status
!
ip route 0.0.0.0 0.0.0.0 10.13.5.1
ip debounce-time 0
ip source-route
!
router ospf 5
  no ospf shutdown
  ip route-type both
  timers spf 3
  maximum-paths 4
  ospf auto-cost reference-bandwidth 100
  distance ospf intra-area 110
  distance ospf inter-area 112
  distance ospf external 114
! Area 0.0.0.0
!
! Trap Source: <not configured>
! Note: SNMP server not running.
!
host1#

```

Example 2 In the following example, the output display consists only of lines that contain the string *ip*. The system omits all other lines of the output from the display because none of them contains the string *ip*.

```

host1#show config include-defaults | include ip
! Configuration script generated on WED JUN 06 2001 02:17:00 UTC
strip-domain disable
Please wait...log verbosity low ipEngine
log verbosity low ipEngineering
log verbosity low ipGeneral
log verbosity low ipInterface
log verbosity low ipNhopTrackerEngineering
log verbosity low ipNhopTrackerGeneral
log verbosity low ipProfileMgr
log verbosity low ipProfileMgrEngineering
!
bandwidth oversubscription
ip domain-lookup

```

```

ip name-server 10.2.0.3
ip domain-name 789df
interface ip 0/0
interface ip 2/0
interface ip s10
  ip address 10.13.5.61 255.255.255.0
  no ip proxy-arp
  no ip directed-broadcast
  ip redirects
ip route 0.0.0.0 0.0.0.0 10.13.5.1
ip debounce-time 0
ip source-route
no ip ftp source-address
  type echo protocol ipIcmpEcho 10.5.0.200 source fastEthernet0/0
  type pathEcho protocol ipIcmpEcho 10.2.0.3
  type echo protocol ipIcmpEcho 10.5.0.11 source-ipaddr 10.13.5.61
!
controller t1 6/0
  framing esf
  lineCoding b8zs
  clock source line
  cablelength short 0
  no remote-loopback
!
log engineering
log verbosity low
no log severity
log verbosity low NameResolverLog
log verbosity low atm
log verbosity low atm1483
log verbosity low atmAa15
log verbosity low bgpConnections
log verbosity low bgpDampening
!
host1#

```

Example 3 In the following example, the output display consists only of lines that do not contain the string `!`. The system omits all other lines of the output from the display because each line contains the string `!`.

```

host1#show config include-defaults | exclude !
boot config running-configuration
boot system 3-3-1.rel
no boot backup
no boot subsystem
no boot backup subsystem
boot revert-tolerance 3 1800
no boot force-backup
aaa domain-map jacksonville
  virtual-router miami
  strip-domain disable
aaa domain-map jak
  virtual-router default
  strip-domain disable
aaa domain-map northeast
  virtual-router default
  strip-domain disable
aaa delimiter realmName "/"
hostname host1
no aaa new-model
no service ctrl-x-reboot
no service password-encryption

```

```

no baseline show-delta-counts
clock timezone UTC 0 0
no exception dump
exception protocol ftp anonymous null
controller sonet 2/0
    sdh
    loopback network
    clock source line
    no shutdown
    path 0 overhead j1 msg hello
    path 0 overhead j1 exp-msg
ftp-server enable
no login
log engineering
log verbosity low
no log severity
log verbosity low NameResolverLog
log verbosity low aaaAtm1483Cfg
log verbosity low atm1483
log verbosity low atmAal5
log verbosity low bgpConnections
log verbosity low bgpDampening
log verbosity low bgpEng1
log verbosity low bgpEngineering
log verbosity low bgpEvents
log verbosity low bgpKeepAlives
no log engineering
log fields timestamp instance no-calling-task
timing select primary
timing source primary internal
timing source secondary internal
timing source tertiary internal
no atm aal5 snmp trap link-status
no atm aal5 shutdown
interface atm 2/0.1 point-to-point
    no shutdown
    no atm atm1483 shutdown
    no atm atm1483 snmp trap link-status
ip route 0.0.0.0 0.0.0.0 10.13.5.1
ip debounce-time 0
ip source-route

```

Redirection of show Command Output

You can redirect the output of **show** commands to network files or local files (in NVS memory) using the redirection operators described in Table 5.

Table 5: Redirect Operators

Redirect Operator	Use
>	Redirects output to the specified file, overwriting the file if it already exists, creating the file if it does not.
>>	Appends output to the end of the specified file, creating the file if it does not exist.
&>	Redirects output to the specified file, overwriting the file if it already exists, and displays the output on the screen. The redirection is synchronized with the screen display; for example, if a --More-- prompt appears, the redirection halts until you take further action.
&>>	Appends output to the end of the specified file and displays the output to the screen. The redirection is synchronized with the screen display; for example, if a --More-- prompt appears, the redirection halts until you take further action.

For example, you can redirect the output of the **show config** command to a script file and later run that script:

```
host1#show config > showconfig.scr
```

The following command *writes* the output to a text file, version.txt, on a remote router:

```
host1#show hardware > pc:/erxfiles/version.txt
```

The following command *appends* the output to version.txt:

```
host1#show hardware >> version.txt
```

You can use redirection with output filtering. The general syntax is:

```
show options [ { > | >> | &> | &>> } filename ]
[ [ { begin | include | exclude } filterstring ]
```

The filtering is performed before redirection. In the following example, the cnfgfltr.txt file will contain the output of **show config include-defaults** beginning with the first occurrence of the string *inter*.

```
host1#show config include-defaults &> cnfgfltr.txt | begin inter
```

Regular Expressions

A regular expression uses special characters—often referred to as metacharacters—to define a pattern that is compared with an input string. You can use regular expressions to filter the output of **show** commands and to define AS-path access lists and community lists to more easily filter routes.

For examples of using regular expressions with AS-path access lists and community lists, see *JUNOS IP Services Configuration Guide, Chapter 1, Configuring Routing Policy*.

Metacharacters

Table 6 describes the metacharacters supported for regular expression pattern-matching.

Table 6: Supported Regular Expression Metacharacters

Metacharacter	Description
^	Matches the beginning of the input string. Alternatively, when used as the first character within brackets—[^]—matches any number except the ones specified within the brackets.
\$	Matches the end of the input string.
.	Matches any single character, including white space.
*	Matches 0 or more sequences of the immediately previous character or pattern.
+	Matches 1 or more sequences of the immediately previous character or pattern.
?	Matches 0 or 1 sequence of the immediately previous character or pattern.
()	Specifies patterns for multiple use when followed by one of the multiplier metacharacters: asterisk *, plus sign +, or question mark ?
[]	Matches any enclosed character; specifies a range of single characters.
– (hyphen)	Used within brackets to specify a range of AS or community numbers.
_ (underscore)	Matches a ^, a \$, a comma, a space, a {, or a }. Placed on either side of a string to specify a literal and disallow substring matching. Numerals enclosed by underscores can be preceded or followed by any of the characters listed above.
	Matches characters on either side of the metacharacter; logical OR.

Using Metacharacters as Literal Tokens

You can remove the special meaning of a metacharacter by preceding it with a backslash (\). Such a construction denotes that the metacharacter is *not* treated as a metacharacter for that regular expression. It is simply a character or token with no special meaning, just as a numeral has no special meaning. The backslash applies only to the character immediately following it in the regular expression.

On the E-series router, you are likely to do this only for the parentheses characters, (or). BGP indicates a segment of an AS path that is of type AS-confed-set or AS-confed-seq by enclosing that segment within parentheses.

The - More- Prompt

When command output continues beyond the available space on your monitor screen, the system displays the --More-- prompt. If you press Enter, the system displays the next line of output. If you press the Spacebar, the system displays the next screen of output.

You can begin filtering the output from the `--More--` prompt, or change a filter that is already in effect, by entering one of the following characters and a text string:

<code>+</code> (plus)	Displays all output lines that contain the text string
<code>-</code> (minus)	Displays all output lines that do not contain the text string
<code>/</code> (forward slash)	Displays all output lines starting at the first line that contains the text string

Initial spaces are not ignored when you filter at the `--More--` prompt.

Example 1 In the following example, the output is displayed until the screen is filled and the `--More--` prompt appears. By entering the filter `/interf`, the user forces the system to filter out all output lines until the first occurrence of the string *interf*. The system displays that line and all following lines of the output.

```
host1#show config include-defaults
! Configuration script being generated on FRI AUG 04 2006 12:48:48 UTC
! Juniper Edge Routing Switch ERX-700
! Version: 7.3.0 beta-1.6 [BuildId 5672] (July 11, 2006 11:58)
! Copyright (c) 1999-2006 Juniper Networks, Inc. All rights reserved.
!
boot config running-configuration
boot system erx_7-3-0.rel
no boot backup
no boot subsystem
no boot backup subsystem
boot revert-tolerance 3 1800
no boot force-backup
!
aaa domain-map jacksonville
virtual-router miami
strip-domain disable
!
aaa domain-map jak
virtual-router default
strip-domain disable
!
aaa domain-map northeast
virtual-router default

/interf
(Suppressing output until 'interf' is found, press ^C to end...)
interface null 0
interface ip 0/0
arp timeout 21600
!
interface ip 2/0
arp timeout 21600
!
interface ip s10
arp timeout 21600
!
interface atm 2/0
no shutdown
atm sonet stm-1
loopback line
atm uni-version 3.0
```



```
atm oam loopback-location 0xFFFFFFFF
--More--
```

Example 2 In the following example, the output is displayed until the screen is filled and the --More-- prompt appears. By entering the filter **+ip**, the user forces the system to filter out all lines from the remainder of the output that do not contain the string *ip*. The system displays only lines that contain the string *ip*.

```
host1#show config include-defaults
! Configuration script being generated on FRI AUG 04 2006 12:48:48 UTC
! Juniper Edge Routing Switch ERX-700
! Version: 7.3.0 beta-1.6 [BuildId 5672] (July 11, 2006 11:58)
! Copyright (c) 1999-2006 Juniper Networks, Inc. All rights reserved.
!
boot config running-configuration
boot system erx_7-3-0.rel
boot config running-configuration
boot system 3-3.1.rel
no boot backup
no boot subsystem
no boot backup subsystem
boot revert-tolerance 3 1800
no boot force-backup
!
aaa domain-map jacksonville
virtual-router miami
strip-domain disable
!
aaa domain-map jak
virtual-router default
strip-domain disable
!
aaa domain-map northeast
virtual-router default
--More--
+ip
(Displaying only lines that include 'ip', press ^C to end...)
strip-domain disable
log verbosity low ipEngine
log verbosity low ipEngineering
log verbosity low ipGeneral
log verbosity low ipInterface
log verbosity low ipNhopTrackerEngineering
log verbosity low ipNhopTrackerGeneral
log verbosity low ipProfileMgr
log verbosity low ipProfileMgrEngineering
log verbosity low ipRoutePolicy
log verbosity low ipRoute
log verbosity low ipTraffic
log verbosity low ipTunnel
log verbosity low ripEngineering
log verbosity low ripGeneral
log verbosity low ripRoute
log verbosity low ripRtTable
bandwidth oversubscription
ip domain-lookup
ip name-server 10.2.0.3
ip domain-name 789df
ip explicit-path name xyz disable
interface ip 0/0
interface ip 2/0
--More--
```

Example 3 In the following example, the output is displayed until the screen is filled and the `--More--` prompt appears. By entering the filter `-!`, the user forces the system to filter out all comments from the remainder of the output; that is, output lines that contain the string `!`. The system displays only lines that do not contain the string `!`.

```

host1#show config include-defaults
! Configuration script being generated on FRI AUG 04 2006 12:48:48 UTC
! Juniper Edge Routing Switch ERX-700
! Version: 7.3.0 beta-1.6 [BuildId 5672] (July 11, 2006 11:58)
! Copyright (c) 1999-2006 Juniper Networks, Inc. All rights reserved.
!
boot config running-configuration
boot system erx_7-3-0.rel
boot config running-configuration
boot system 3-3.1.rel
no boot backup
no boot subsystem
no boot backup subsystem
boot revert-tolerance 3 1800
no boot force-backup
!
aaa domain-map jacksonville
    virtual-router miami
    strip-domain disable
!
aaa domain-map jak
    virtual-router default
    strip-domain disable
!
aaa domain-map northeast
    virtual-router default
--More--
-!
(Displaying only lines that exclude '!'. press ^C to end...)
    strip-domain disable
aaa delimiter realmName "/"
hostname host1
no aaa new-model
no service ctrl-x-reboot
no service password-encryption
no baseline show-delta-counts
clock timezone UTC 0 0
no exception dump
exception protocol ftp anonymous null
line vty 4
    exec-timeout 0 0
    exec-banner
    motd-banner
    timeout login response 30
    data-character-bits 8
    no login
log engineering
log verbosity low
no log severity
log verbosity low NameResolverLog
log verbosity low aaaAtm1483Cfg
log verbosity low aaaEngineGeneral
log verbosity low aaaServerGeneral
log verbosity low aaaUserAccess
log verbosity low addressServerGeneral
log verbosity low atm
log verbosity low atm1483

```

```
log verbosity low atmAa15
log verbosity low bgpConnections
log verbosity low bgpDampening
log verbosity low bgpEng1
--More--
```

Responding to Prompts

For some actions, the system prompts you for a response. The acceptable default responses are the following:

- You can press **y** or Enter to agree with the prompt and continue.
- You can press any other key to disagree with the prompt and cancel the action.

You can use the **confirmations explicit** command to require a more explicit response to CLI prompts.

confirmations explicit

- Use to require an explicit response to a CLI prompt, as follows:
 - To agree with the prompt and continue, you must type **y** and press Enter, type **ye** and press Enter, or type **yes** and press Enter.
 - To disagree with the prompt and cancel the action, you must type **n** and press Enter or type **no** and press Enter.
 - Pressing Enter alone, or entering any other characters, is not an acceptable response, and the CLI will repeat the prompt.
- Acceptable responses to a prompt are not case sensitive.
- Use the **no** version to restore the default state, where pressing **y** or Enter alone responds in the affirmative, and any other entry is accepted as a negative response.



NOTE: The system's CLI supports a powerful command-line editor, enabling you to easily correct, edit, and recall previously entered commands. For more information, see *Using Command-Line Editing* on page 65.

For a description of the commands that you use to get around the CLI, see *Chapter 5, Managing the System*.

CLI Status Indicators

The E-series software includes two types of indicators to inform you of the status of your CLI operation.

- The **dot service** indicator is used when your operation does not finish within 2 seconds. The service displays the Please wait message and a dot every 5 seconds until the operation is completed. The dot service is used for all CLI operations, except those that use the more descriptive progress indicator.
- The **progress indicator** is an animated representation of how much progress has been made on a CLI operation that does not finish within the expected completion time. This type of status indicator is supported for the file system synchronization application and the file copy application.

The progress indicator displays a series of dots that represents the time required to complete the operation. The dots are followed by the actual percentage of the total that has been completed and by an oscillating asterisk that indicates ongoing activity.

As the application progresses, the dots are replaced with asterisks, starting at the left, to represent how much of the operation is finished. The actual percentage is also adjusted accordingly. When the operation is complete, all dots are replaced by asterisks, and the message DONE replaces the numerical percentage.

The number of dots that appears and the percentage of completion represented by each dot or asterisk are based on the terminal width. For example, if the terminal is set to 80 characters, each of the 50 dots indicates 2 percent of the total time (2 percent x 50 characters = 100 percent). See *Chapter 5, Managing the System* for information about setting the terminal width.

The following examples show progress indicator output for a 50-character-wide display.

```
***** ..... (10%) *
***** ..... (90%) *
***** (DONE)
```

Levels of Access

The CLI has two levels of access: *user* and *privileged*.

User Level

User level allows you only to view a router's status. This level restricts you to User Exec mode.

Privileged Level

Privileged level allows you to view a router configuration, change a configuration, and run debugging commands. You need a password to access this level. This level gives you full CLI privileges. Passwords are covered in more detail in *Chapter 9, Passwords and Security*.

Initialization Sequence

Each line module in a router is initialized independently. As a result, the CLI on the SRP module can become available before the line modules have completed initialization. Commands relating to a line module can fail if the module has not completed initialization. The **show version** command can be used to display line module status. Do not enter commands for a line module until its state is online.

Platform Considerations

The CLI is supported on all E-series routers.

For information about the modules supported on E-series routers:

- See the *ERX Module Guide* for modules supported on ERX-7xx models, ERX-14xx models, and the ERX-310 router.
- See the *E120 and E320 Module Guide* for modules supported on the E120 router and the E320 router.

Accessing the CLI

This section describes logging in to and exiting from the router.

Logging In

The system supports a local console session and up to 30 virtual terminal (vty) sessions simultaneously. A virtual terminal session can be a Telnet session, Secure Shell Server (SSH) protocol session, or File Transfer Protocol (FTP) server session.



NOTE: The vty session factory default is 5. Use the **line** command to configure up to a maximum of 30 vtys. The configured vtys are shared among all types of connections; for example, if you configure 7 vtys, then no more than a total of 7 SSH plus FTP plus Telnet sessions can simultaneously exist on the router.

To access the system through a local console, attach a terminal to the system console port. To access the system through Telnet, Telnet client software must be installed on your host system. To access the system through SSH, SSH version 2.0 client software must be installed on your host system. To access the system through FTP, FTP client software must be installed on your host system.

You can configure Telnet to validate login requests. See *Vty Line Authentication and Authorization* in *Chapter 9, Passwords and Security*, for more information. Once Telnet is running on your host system, type in the E-series router name or its IP address and press Enter. To use a name, your network must have a name server.

For example, for Microsoft Windows NT enter:

```
telnet 192.168.1.13
```

or

```
telnet westford2
```

You are connected to your E-series router when the following prompt appears:

```
Logging in.  
host1>
```



NOTE: At this point, you have access only to User Exec commands.

To connect through SSH, refer to your SSH client documentation.

Privileged-Level Access

You access the CLI Privileged Exec commands using the **enable** command.

Defining CLI Levels of Privilege

The CLI has the ability to map any command to one of 16 levels of command privilege (0 to 15). When you access the Privileged Exec mode, you have access to those commands that map to your access level or below. In other words, if you access the Privileged Exec mode at access level 10 (the default), you have access to all commands with an access level setting of 10 or lower.

In general, command privileges fall within one of the following levels:

- 0—Allows you to execute the **help**, **enable**, **disable**, and **exit** commands
- 1—Allows you to execute commands in User Exec mode plus commands at level 0
- 5—Allows you to execute Privileged Exec **show** commands plus the commands at levels 1 and 0
- 10—Allows you to execute all commands except support commands, which may be provided by Juniper Networks Customer Service, or the **privilege** command to assign privileges to commands
- 15—Allows you to execute support commands and assign privileges to commands

For information about how to set individual command levels, see *CLI Command Privileges* on page 50.

Accessing the Privileged Exec Level

You can access the Privileged Exec commands using one of 16 levels of command privilege. If you do not enter a privilege level and you are not accessing the router through a RADIUS authentication account, the default CLI access level is 10.

To access the default Privileged Exec mode:

1. At the prompt, type **enable** and press Enter.

```
host1>enable
Password:
```



NOTE: You will be prompted for a password only if your system has been configured with one. Refer to the **enable secret** and **enable password** Global Configuration commands described in *Chapter 9, Passwords and Security*.

2. Type your password and press Enter.

```
Password:*****<Enter>
host1#
```

You can tell that you have access to Privileged Exec mode when the command prompt changes from a > character to a # character.

enable

- Use to move from User Exec to Privileged Exec mode.
- Privileged Exec mode allows you to access all other user interface modes. From here you can configure, monitor, and manage all aspects of the router.
- You can access the Privileged Exec commands using one of 16 levels of command privilege. If you do not enter a privilege level and you are not accessing the router through a RADIUS authentication account, the default CLI access level is 10.
- Set a password for this mode by using either the **enable password** or the **enable secret** command in Global Configuration mode. This protects the system from any unauthorized use.
- Once a password is set, anyone trying to use Privileged Exec mode will be asked to provide the password.
- Example 1 (accessing Privileged Exec mode at the default level [10])


```
host1>enable
password:*****
host1#
```
- Example 2 (accessing Privileged Exec mode at the highest level [15]; a password is not set for this example)


```
host1>enable 15
host1#
```
- There is no **no** version.

Moving from Privileged Exec to User Exec Mode

To move from the Privileged Exec mode to the User Exec mode, enter the **disable** command. For example:

```
host1#disable
host1>
```



NOTE: Using the **exit** command from either the Privileged Exec or User Exec mode logs out of the CLI.

To move to a lower Privileged Exec mode, follow the **disable** command with an access level value. For example:

```
host1#show privilege
Privilege level is 10
host1#disable 5
```

```
host1#show privilege
Privilege level is 5
```

disable

- Use to exit Privileged Exec mode and return to User Exec mode.
- Use to shift to a lower Privilege Exec mode level without returning to User Exec mode. Specifying a privilege level after the **disable** command changes the Privileged Exec mode to the lower level that you specify; you do not return to User Exec mode.
- Example 1


```
host1#disable
host1>
```
- Example 2


```
host1#show privilege
Privilege level is 10
host1#disable 5
host1#show privilege
Privilege level is 5
```
- There is no **no** version.

Logging Out

You can log out of the CLI from either the User Exec and Privileged Exec modes by entering the **exit** command. For example:

```
host1>exit
logging out.
```

or

```
host1#exit
logging out.
```

CLI Command Privileges

You can change the privilege level of most commands by using the **privilege** command that is available in Global Configuration mode. To use this command, you must enable your CLI session to privilege level 15.

CLI Privilege Groups

You can change privilege group accessibility. Privilege groups are no longer required to be hierarchical. You can modify the privilege group membership and define which privilege group is a member of another privilege group.

A privilege group can contain commands and other privilege groups as members. A group always has access to commands in its own privilege group and in privilege group 0. By default, all groups have one member and a specific privilege group has access to all commands in all privilege groups with a lower number than the specific group.

A privilege group is reachable from another privilege group when it is a member of that privilege group, or a member of a group that is a member of that privilege group until a search of all member groups is exhausted. This can go through several recursions as long as there are no circular dependencies.

Privilege group 0 is not a member of any group and you cannot assign member groups to it, but it is reachable from every privilege group.

Numbers in the range 0—15 identify the 16 privilege groups. Each of the 16 groups can have a name or an alias. The default internal name is the privilege group number. By default, the groups are hierarchical and each group, with the exception of groups 1 and 0, contains one group. When a group contains a group, the contained group is a member of the original group: privilege group *p* has one member, privilege group *p*-1. For example, privilege group 15 has member 14, privilege group 14 has member 13, and privilege group 2 has member 1.

For hierarchical groups, groups 0 through 14 are reachable from privilege group 15, groups 0 through 13 are reachable from privilege group 14, groups 0 to 4 are reachable from 5, and so forth. Hierarchical groups can also contain other privilege groups. For example, group A is reachable from group B if group A is a member of group B or is a member of a group that is a member of group B. If group X has member Y and Y has member Z then Z is reachable from X.

You cannot configure circular dependencies. For example, you cannot configure a circular dependency where group X has member Y, Y has member Z, Z has member P, and X can reach Z and P. Group X cannot have member Z or P because Z and P are reachable through Y.

Examples Using Privilege Group Membership

In each of the following examples, privilege groups are at the default setting, where privilege group 0 is reachable from every privilege group, 15 contains 14, 14 contains 13, 13 contains 12, and so forth. The commands in each example change the privilege group settings from the default.

Example 1 `host1(config)#privilege-group membership clear 11`
`host1(config)#privilege-group membership 15 add 10`

In Example 1:

- Privilege group 11 does not contain any privilege groups
- Privilege group 15 contains group 10. Therefore, privilege group 10 and all groups contained or reachable from privilege group 10 are now reachable from privilege group 15.
- Because privilege group 15 already contains privilege group 14, all groups with the exception of privilege group 11 are reachable from privilege group 15.
- A command that is in privilege group 11 can only be executed by a user at privilege 11. A user at any other privilege does not have access to privilege group 11 commands.

Example 2 `host1(config)#privilege-group membership 14 remove 13`

In Example 2:

- Privilege group 14 does not contain any privilege groups.
- Privilege group 15 contains two groups: 14 and 10. The privilege groups 0, 1, 2, 4, 5, 6, 7, 8, 9, 10, and 14 are reachable from privilege group 15.
- A user at privilege 15 does not have access to commands in privilege groups 11, 12, or 13.

Example 3 `host1(config)#privilege-group membership clear 13`
`host1(config)#privilege-group membership 13 add 10`

In Example 3:

- Commands are executed in the following sequence: 15 contains 14, 14 contains 13, 13 contains 12, and so forth.
- Privilege group 13 contains one privilege group: privilege group 10.
- The privilege groups 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 are reachable from privilege group 13.

Example 4 `host1(config)#privilege-group membership 12 remove 11`
`host1(config)#privilege-group membership 12 add 5`
`host1(config)#privilege-group membership 11 add 5`

In Example 4:

- Commands are executed in the following sequence: 15 contains 14, 14 contains 13, 13 contains 12, and so forth.
- Privilege group 12 contains one privilege group: the privilege group 5.
- Privilege group 11 contains one privilege group: the privilege group 5.
- Privilege groups 0, 1, 2, 3, 4, 5 are reachable from privilege groups 12 and 11.

Example 5 `host1(config)#privilege-group membership clear 9 8 7`
`host1(config)#privilege-group membership 7 add 1`
`host1(config)#privilege-group membership 8 add 14`

In Example 5:

- Privilege group 9 contains no privilege groups.
- Privilege group 8 contains group 14.
- Privilege group 7 contains group 1.

Example 6 `host1(config)#privilege-group alias 13 LI`
`host1(config)#privilege-group alias 10 dailyAdmin`
`host1(config)#privilege-group alias 7 weekendAdmin`
`host1(config)#privilege-group alias 6 dailyTroll`

```
host1(config)#privilege-group alias 5 basicUser
host1(config)#privilege-group alias 0 minUser
host1(config)#privilege-group alias 15 superUser
```

In Example 6, a number or name can specify the seven privilege groups 0, 5, 6, 7, 10, 13, and 15.

Example 7 host1(config)#**privilege-group membership clear dailyAdmin**
 host1(config)#**privilege-group membership dailyAdmin add dailyTroll**

In Example 7, privilege group 10 alias dailyAdmin has one member: privilege group 6 alias dailyTroll.

Example 8 host1(config)#**no privilege-group membership 9**

Example 8 reverts one privilege group membership to its default setting. Prior to the execution of this command, the following group memberships were in place:

group	member	reachable
8	12	12,0
9	--	0
10	9	9,0
11	10	10,9,0
12	11	11,10,9,0

Reverting privilege group 9 to its default gives it one member: privilege group 8. This creates the circular dependency: 8 contains 12, 12 contains 11, 11 contains 10, 10 contains 9, and 9 contains 8.

Example 9 host1(config)#**no privilege-group membership**

In Example 9, privilege group membership reverts to the default setting. All privilege groups revert to hierarchical settings: 15 contains 14, 14 contains 13, 13 contains 12, and so forth. Privilege group 0 is reachable from every privilege group.

Example 10 host1(config)#**no privilege-group membership 7**

In this example, one privilege group membership reverts to its default setting. Privilege group 7 contains group 6.

Example 11 host1(config)#**no privilege-group alias**

In Example 11, all alias settings are removed.

Example 12 host1#**show privilege group**

privilege group	privilege group alias	directly reachable groups	all reachable groups *
-----	-----	-----	-----
0	minUser	--	--
1	--	--	0
2	--	1	0 1
3	--	2	0 1 2
4	--	3	0 1 2 3

5	basicUser	4	0 1 2 3 4
6	dailyTroll	5	0 1 2 3 4 5
7	weekendAdmin	1	0 1
8	--	14	0 14
9	--	--	0
10	dailyAdmin	6	0 1 2 3 4 5 6
11	--	5	0 1 2 3 4 5
12	--	5	0 1 2 3 4 5
13	LI	10	0 1 2 3 4 5 6 10
14	--	--	0
15	superUser	10 14	0 1 2 3 4 5 6 10 14 15

*Privilege Group can reach itself

Example 12 shows privilege group overrides in effect.

Example 13 `host1#show privilege group 15 superUser`
 The following groups are directly reachable:
 14
 dailyAdmin

The following groups are reachable:
 1
 14
 2
 3
 4
 basicUser
 dailyAdmin
 dailyTroll
 minUser

In Example 13, groups 14 and dailyAdmin are directly reachable and groups 1, 14, 2, 3, 4, basicUser, dailyAdmin, dailyTroll, and minUser are reachable.

privilege

- Use to change the privilege level of any command within a specified mode.
- Example 1
`host1(config)#privilege exec level 12 terminal width`
- Example 2
`host1(config)#privilege exec all level 5 terminal`
- Use the **all** keyword to change the privilege level of groups of commands. For more information, see *Setting Privilege Levels for Multiple Commands* on page 57.
- Use the **reset** version to restore the default privilege level for the command; issuing this command results in the **show configuration** command not showing the default privilege setting for the command.
- Use the **no** version to restore the default privilege level for the command; issuing this command results in the **show configuration** command showing the default privilege level of the command in its output.



NOTE: You must access the CLI at privilege level 15 to view or use this command.

privilege-group alias

- Use to give the privilege group name alias to the privilege group.
- Example
host1(config-if)#**privilege-group alias**
- Use the **no** version to remove the privilege group alias.

privilege-group membership

- Use to add the member group to or remove the member group from the privilege group.
- Example
host1(config-if)#**privilege-group membership**
- Use the **no** version to restore one or all privilege groups to the default settings. When all privilege groups are reset to the default settings, the privilege group membership is hierarchical.

privilege-group membership clear

- Use to clear a privilege group or all members from a privilege group.
- Example
host1(config-if)#**privilege-group membership clear**
- There is no **no** version.

CLI Command Exceptions

Changing command privilege levels can be a powerful security tool. However, changing the command privilege for some commands could render the CLI unusable and require you to reboot the router. To eliminate this possibility, the CLI does not allow you to remap the following commands:

- **disable**
- **enable**
- **exit**
- **help**
- **privilege**
- **support**

CLI Keyword Mapping

You cannot change the privilege level of keywords that are separated from the command string by a parameter in the command sequence. In other words, once the privilege algorithm reaches a parameter, the privilege algorithm that maps the commands to the desired privilege level stops and allows any keyword options that may follow in the command sequence. The algorithm then waits for a carriage return before looking at the next command sequence.

For example, you can change the command privilege level for the **telnet** command. However, because the **telnet** command is immediately followed by a variable (that is, a hostname or IP address) and not a keyword, you cannot change the privilege level for any keywords that follow the command.

```
host1#telnet ?
      HOSTNAME or A.B.C.D  The ip address of the remote system
```

```
host1#telnet router2 ?
<0 - 65535>      The port on which to send the request
bgp              Border Gateway Protocol (179)
chargen          Character generator (19)
cmd              Remote commands (rcmd, 514)
.
.
.
```

Setting Privileges for Ambiguous Commands

The **privilege** command allows you to set command privilege levels for parts of commands that the CLI would normally consider ambiguous. In other words, you can set privilege levels by specifying letters that represent only the beginning part of a command or group of commands (even the first letter of a command or group of commands).

The following example sets the privilege level to 12 for any Exec mode (user or privileged) command that start with the letter “t”:

```
host1(config)#privilege exec level 12 t
```

The list of affected commands includes **telnet**, **terminal**, **test**, and **traceroute**.

The following example changes all the above commands, with the exception of the **traceroute** command, to level 15:

```
host1(config)#privilege exec level 15 te
```

The following example changes all commands that start with the letters “te” (for example, **telnet**, **terminal**, and **test**) and any second keyword that starts with the letter “i” and follows a command that starts with the letters “te” (for example, the keyword “ip” in the command **test ip**) to level 1:

```
host1(config)#privilege exec level 1 te i
```

When you enter an ambiguous command and an exact match of the command is found, partial matches are ignored and are not modified.

For example, the **traffic-class** and **traffic-class-group** commands are available in Global Configuration mode. If you issue the **privilege configure level 5 traffic-class** command, an exact match is made to **traffic-class**, and **traffic-class-group** is not modified.

If you want to set the privilege level for both **traffic-class** and **traffic-class-group** and you do not want the exact match to be made to **traffic-class**, issue a partial command such as **traffic-c**. The privilege level of all commands that begin with **traffic-c** is modified.

Setting Privilege Levels for no or default Versions

The **privilege** command allows you to set command privilege levels for **no** and **default** versions of commands. However, setting the privilege level for either the **no** or **default** versions of a command does *not* set the privilege level of the affirmative version of the command. This means that you can have the **no** or **default** version of a command at a different privilege level than its affirmative version.



NOTE: You can set the **no** or **default** command to a separate privilege level without specifying any other command to follow. This would force all commands that have a **no** or **default** version to function only for that privilege level and higher.

For example, if you issue the **privilege exec level 10 no** command, all **no** versions in the Privileged Exec mode are available to users at level 10 and higher.

Setting Privilege Levels for Multiple Commands

The **all** keyword is a wildcard parameter that enables you to set privilege levels for multiple commands rather than setting them individually.

Setting Privilege Levels for All Commands in a Mode

You can set the privilege level for all commands within a specified mode. This setting includes all commands in modes that you can access from a specified mode.

If the command specified in the **privilege** command changes the configuration mode, all commands in the configuration will also be set to the specified privilege level. For more information about accessing modes, see *Accessing Command Modes* on page 67.

For example, issuing the **configure** command in Privileged Exec mode changes the configuration mode to Global Configuration. If you issue the **privilege exec all level 5 configure** command, all commands in Global Configuration mode become accessible to users who have CLI privileges at level 5 and higher. For more information about user privilege levels, see *Privileged-Level Access* on page 48.

Setting Privilege Levels for a Group of Commands

You can set the privilege level for a group of commands by using the beginning keyword in a command.

For example, if you issue the **privilege configure all level 5 snmp** command, all commands in Global Configuration mode that begin with **snmp** become accessible to users who have CLI privileges at level 5 and higher.

Using the Order of Precedence

The effectiveness of a privilege level that is set with the **all** keyword depends on its precedence level in the CLI. A privilege level is considered to be in effect only if a privilege level that is configured at a higher precedence level does not override it.

The CLI uses the following order of precedence:

1. Privilege level set for all commands within a mode, including modes that are accessed from another mode; for example, Global Configuration mode
2. Privilege level set for all commands that begin with the same keyword; for example, **snmp** commands
3. Privilege level set for individual commands; for example, **snmp-server community**



NOTE: This order of precedence does not apply to privilege levels that are set without the **all** keyword.

In the following example, the privilege level of the **snmp-server community** command is set to level 11, the privilege level for all commands that begin with **snmp** is set to level 10, and the privilege level for all commands in Global Configuration mode is set to level 5.

```
host1(config)#privilege configure level 11 snmp-server community
host1(config)#privilege configure all level 10 snmp
host1(config)#privilege exec all level 5 configure
```

The following **show configuration** output displays the privilege levels set above. The privilege levels for the **snmp-server community** command and the **snmp-server** group of commands are still present in the output. However, the privilege level of Global Configuration mode takes precedence, and the privilege levels of the other commands are rendered ineffective. Users can access all **snmp** commands at level 5 or higher.

```
host1#show config category management cli command-privileges
privilege configure level 11 snmp-server community
privilege configure all level 10 snmp-server
privilege exec all level 5 configure
```

Superseding Privilege Levels with the all Keyword

Issuing the **all** keyword supersedes privilege levels that were previously set without the **all** keyword.

In the following example, the **snmp-server-community** command is set to level 7, and the **snmp** keyword is set to level 6. The privilege level of the **snmp** keyword does not override the **snmp-server community** setting, because both of these commands are set without the **all** keyword.


```
host1(config)#privilege configure level 7 snmp-server community  
host1(config)#privilege configure level 6 snmp
```

All **snmp** commands are then changed to level 5 with the **all** keyword.

```
host1(config)#privilege configure all level 5 snmp
```

The **show configuration** output displays all **snmp** commands at level 5, superseding the existing level 6 setting. The **snmp-server community** command is still present in the show configuration output, but it is ineffective.

```
host1#show config category management cli command-privileges
privilege configure level 7 snmp-server community
privilege configure all level 5 snmp-server
```

Removing the all Keyword

Using the **no** version or **reset** version removes the **all** keyword and restores default privilege levels.

If the privilege setting of the mode or command for which you are restoring default privilege levels takes precedence over any ineffective privilege settings, those settings will automatically take effect according to the order of precedence (see *Using the Order of Precedence* on page 58).

The difference between the **no** version and the **reset** version is that the **reset** version removes the configuration from the **show configuration** output. This is useful when you want to remove a configuration that has been overridden and rendered ineffective by a privilege level that takes precedence.

Setting Default Line Privilege

The factory default privilege level for the console line and all vty lines is 1. However, you can use the **privilege level** command in Line Configuration mode to set the default login privilege for the console line or any number of vty lines.

To change the default privilege level:

1. Access line configuration mode on the router for the console.

```
host1(config)#line console 0
host1(config-line)#
```

or on one or more vty lines

```
host1(config)#line vty 0 12
host1(config-line)#
```



NOTE: The latter command configures vty lines 0 to 12.

2. Specify a starting privilege level for the line or lines.

```
host1(config-line)#privilege level 5
```

The default privilege level for the specified line (or lines) changes. The new values take effect immediately for any new users. If using the console line, you must exit out of the CLI and reestablish a connection before the default takes effect.

If you are validating through RADIUS or TACACS + and the server specifies an enable level, that enable level takes precedence over the line privilege level.

privilege level

- Use to change the default privilege level of the console line or one or more vty lines.
- Example
host1(config-line)#**privilege level 5**
- Use the **no** or **default** version to restore the default privilege level for the command.



NOTE: You must access the CLI at privilege level 15 to view or use this command.

Viewing CLI Privilege Information

You can view CLI privilege information for yourself (the current user), all connected users on the router, or for any modified CLI commands.

Viewing the Current User Privilege Level

Use the **show privilege** command to view your current privilege level.

show privilege

- Use to view your current privilege level.
- Example
host1#**show privilege**
Privilege level is 10
- There is no **no** version.

Viewing Privilege Levels for All Connected Users

Use the **show users detail** command to view the privilege levels for all users currently connected to the router. See *Monitoring the FTP Server* on page 262 for information about the **show users detail** command.

Viewing Privilege Levels for Changed CLI Commands

Use the **show configuration** command to view the changed privilege levels for any modified CLI commands. See *Saving the Current Configuration* on page 234 for information about the **show configuration** command.



NOTE: The **show configuration** command output displays output specific to the session access level. For example, if the session is enabled at level 5, issuing the **show configuration** command displays only output for commands at level 5 and below.

show privilege group

- Use to view the privilege groups.

- Example

```
host1(config-if)#show privilege group superUser
```

The following groups are directly reachable:

```
14
dailyAdmin
```

The following groups are reachable:

```
1
14
2
3
4
basicUser
dailyAdmin
dailyTroll
minUser
```

- There is no **no** version.

Using Help

The system CLI provides a variety of useful context-sensitive help features. An important thing to remember about using the help features is that the use of a space or the lack of a space before the **?** gives different results. Table 7 describes the help system.

Table 7: Help Commands

Command	Description
?	Lists all keywords applicable to the current command mode
help	Displays a brief description of the help system (available in all command modes)
partial-keyword?	Lists the keywords that begin with a certain character string
partial-keyword < Tab >	Completes the partial keyword you entered, if you have provided an unambiguous abbreviation
command < Space > ?	Lists the set of all valid next available choices

Commands listed in the left column of Table 7 are further described with examples in the following sections.

? (Question Mark Key)

You can use the question mark (?) key whenever you need additional information. When you enter ?, all available choices are displayed. The CLI then redisplay the command you typed. The following examples show different ways you can use the ? key.

When you use ? on a line by itself or when it is preceded by one or more spaces, a list of all next available choices is displayed.

Example 1

host1(config)#?	
aaa	Configure authentication, authorization, and accounting characteristics
access-list	Configure an access list entry
arp	Configure a static ARP entry
bandwidth	Configure slot-group bandwidth control
banner	Define a banner line
baseline	Configure baseline operations
boot	Configure boot time behavior
bulkstats	Configure bulkstats parameters
classifier-list	Configure a classifier list entry
clns	Configure CLNS characteristics
clock	Set the system's clock
confirmations	Configure confirmation mode
controller	Configure controller parameters
crypto	Configure cryptographic parameters
default	Set a command to its default(s)
disable-autosync	Disable automatic synchronization of redundant system controller file system
disable-switch-on-error	Disable automatic switch to redundant system controller upon software/hardware error
do	Run an exec mode command (alias command run)
enable	Configure security related options
end	Exit Global Configuration mode
exception	Configure core dump
exclude-subsystem	Exclude copying a subsystem from the release
exit	Exit from the current command mode
ftp-server	Configure FTP Server characteristics
help	Describe the interactive help system
host	Add/modify an entry to the host table
hostname	Set the host (system) name
interface	Enter Interface Configuration mode
ip	Configure IP characteristics
l2tp	Configure L2TP parameters
license	Configure licenses
line	Enter Line Configuration mode
log	Configure logging settings
macro	Run a CLI macro
map-list	Create an NBMA static map
memory	Configure and administer memory operations
mpls	Configure MPLS global parameters
no	Negate a command or set its default(s)
ntp	Configure the Network Time Protocol
policy-list	Enter Policy Configuration mode
pppoe	Configure PPPoE
profile	Specify a profile
radius	Configure RADIUS server

rate-limit-profile	Enter rate limit profile configuration mode
redundancy	Perform a redundancy configuration
route-map	Configure a route map
router	Configure a routing protocol
rtr	Configure rtr parameters
run	Run an exec mode command (alias command do)
service	Configure system-level services
set	Configure
sleep	Make the Command Interface pause for a specified duration
slot	Configure and administer slot operation
snmp-server	Configure SNMP parameters
sscc	The SSC Client telnet
telnet	telnet daemon configuration
timing	Configure network timing
traffic-shape-profile	Enter traffic shape profile configuration mode
virtual-router	Specify a virtual router

Example 2

host1(config)#ip ?	
address-pool	Configure address pool for PPP Broadband RAS clients
as-path	Configure a path filter for AS-Paths in BGP
bgp-community	Format for BGP community
community-list	Configure an entry in a community list
debounce-time	Specify the minimum amount of time that an event needs to be in same state before being reported
dhcp-local	The DHCP Local Server protocol
dhcp-server	DHCP Server for Proxy Client
domain-lookup	Enable DNS lookup
domain-name	Specify local Domain name
dvmrp	configure dvmrp parameters
dynamic-interface-prefix	Specify name prefix for dynamic Ip shared interfaces
explicit-path	Configure an explicit path
extcommunity-list	The extended community list
ftp	Configure FTP characteristics
http	Configure http server
local	Local IP address assignment
multicast-routing	Enable IP multicast forwarding
name-server	Configure DNS server
pim	Configure PIM Protocol
prefix-list	Configure a prefix list entry
prefix-tree	Configure a prefix tree entry
route	Define a static IP route
router-id	Configure the router-id to be used
rpf-route	Define a static IP route for mcast RPF check
source-route	Configure source-routing capabilities
ssh	Configure SSH characteristics
ttl	Configure the default value to be used by IP for Time-To-Live
tunnel	Configure tunnel parameter
vpn-id	Configure the VPN ID associated with this router
vrf	Specify a VRF
host1(config)#ip	

Example 3

```
host1(config)#ip community-list ?
<1 - 99> The community list
```

```
host1(config)#ip community-list
```

When you want to see a list of commands that begin with a particular set of characters, type a question mark (?) immediately after the last letter. Do not use a space between the partial keyword and the ? key. For example:

```
host1#sh?
show shutdown
host1#sh
```



NOTE: If you want to use the ? character as part of a string, such as a hostname or a regular expression, you must enter the following key sequence: Ctrl + v + ?. Otherwise, the CLI considers the ? to be a request for assistance in completing the command.

help Command

Use the **help** command when you want to see a brief description of the context-sensitive help system.

```
host1>help
Use the help options as follows:
```

```
?, or command<Space>? - Lists the set of all valid next keywords or arguments
partial-keyword?      - Lists the keywords that begin with a certain character
                        string
partial-keyword<Tab> - Completes the partial keyword
host1>
```

Partial-keyword <Tab>

When you cannot recall a complete command name or keyword, type in the first few letters, press Tab, and the system completes your partial entry. You must type enough characters to provide a unique abbreviation. If you type a few letters, press Tab, and your terminal beeps, then you have not typed enough characters to be unambiguous.

```
host1(config)#int<Tab>
host1(config)#interface
```

Using Command-Line Editing

This section provides information about the command-line editor.

Basic Editing

Here are a few basic command-line editing notes:

- **Case**—Keywords are not case sensitive; that is, they can be entered in uppercase, lowercase, or a mix of both. Filenames may be case sensitive. Local filenames are case sensitive; remote filenames are case sensitive if the host system treats filenames as case sensitive. Passwords are case sensitive.
- **Abbreviating keywords**—You may abbreviate keywords using as few characters as you want, as long as the characters provide a unique abbreviation.
- **Executing a command**—Always use the Enter key.

Command-Line Editing Keys

You can use several keys to edit the command line. Table 8 defines the keys for editing the command line. Arrow keys function only on ANSI-compatible terminals, such as VT100s.

Table 8: Command-Line Editing Keys

Key(s)	Function
Delete or Backspace	Removes characters to left of cursor
Left Arrow	Moves cursor one character to left
Right Arrow	Moves cursor one character to right
Ctrl + a	Moves cursor to beginning of command line
Ctrl + b	Moves cursor back one character
Ctrl + d	Deletes character at cursor
Ctrl + e	Moves cursor to end of command line
Ctrl + f	Moves cursor forward one character
Ctrl + h	Deletes character to left of cursor
Ctrl + k	Deletes all characters from cursor to end of command line
Ctrl + l	Redisplays system prompt and command line
Ctrl + o	Toggles overwrite/insert mode
Ctrl + t	Transposes character to left of cursor with character located at cursor
Ctrl + u	Deletes entire command line
Ctrl + v	Allows the “?” character to be used as a character instead of as a request for help
Ctrl + w	Deletes the previous word

Table 8: Command-Line Editing Keys (continued)

Key(s)	Function
Ctrl + x	In all modes, reboots the system. This feature is useful if a command is taking a prolonged time to complete and hangs the console. The command has no effect if you access the system through Telnet. Set the boot option flag by using the service ctrl-x-reboot command from Global Configuration mode.
Ctrl + y	Recalls most recent entry from delete buffer; recalled characters overwrite or are inserted in current line depending on overwrite/insert toggle
Ctrl + z	In all modes except User Exec mode, executes any command typed immediately before the command sequence and then changes the mode to Privileged Exec mode. In User Exec mode, only executes any command typed immediately before the command sequence.
Esc + b	Moves cursor back one word
Esc + Backspace	Deletes previous word
Esc + d	Deletes current or next word

Command History Keys

The CLI maintains two separate command histories. The first command history maintains only Exec mode commands. The second history maintains all commands entered in any of the configuration modes. The appropriate history will automatically be restored as you transition between Global Configuration mode and Exec mode.

Table 9 defines the keys related to command history. Arrow keys functions only on ANSI-compatible terminals, such as VT100s.

Table 9: Command History Keys

Key	Function
Up Arrow <i>or</i> Ctrl + p	Recalls commands in history buffer, starting with most recent command. Repeat key sequence to recall successively older commands.
Down Arrow <i>or</i> Ctrl + n	Returns to more recent commands in history buffer after recalling commands with Up Arrow or Ctrl + p. Repeat key sequence to recall successively more recent commands.
Ctrl + r	Begin a <i>reverse search</i> for a previously entered string in the history buffer by providing a character string when prompted. Enter Ctrl + r to continue searching. Ctrl + h or Del deletes the last character in the string and starts a search on the new string.

Pagination Keys

If the system needs to display more text than you can fit on the screen, the output pauses and the `--More--` prompt appears. Table 10 defines the pagination keys that you can use when the `--More--` prompt appears. For more information, see *The --More-- Prompt* on page 41.

Table 10: Pagination Keys

Key	Function
Enter	Scrolls down one more line
Spacebar	Displays one more screen
+	Displays all output lines that contain the text string
-	Displays all output lines that do not contain the text string
/	Displays all output lines starting at the first line that contains the text string
Any other key	Aborts output and returns you to command prompt

Accessing Command Modes

Table 11 describes the command modes available in the CLI.

Table 11: Command Mode Overview

Mode Name	Use of Mode	Access to Mode	Exit from Mode
AAA Profile Configuration	■ Configure new AAA profiles.	■ From Global Configuration mode, use the aaa-profile command. ■ Prompt: host1(config-aaa-profile)#	■ Use the exit command to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Address Family Configuration	■ Configure BGP or RIP address family parameters.	■ From Global Configuration mode, use the router bgp or router rip to enter Router Configuration mode. From Router Configuration, use the address-family command. ■ Prompt: host1(config-router-af)#	■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
ATM VC Class Configuration	■ Configure a class of attributes for an ATM data PVC.	■ From Global Configuration mode, use the vc-class atm command, and specify the name of the VC class. ■ Prompt: host1(config-vc-class)#	■ Use the exit command to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
ATM VC Configuration	■ Configure individual attributes for an ATM data PVC.	■ From Global Configuration mode, use the interface command to enter Subinterface Configuration mode. From Subinterface Configuration mode, use the pvc command. ■ Prompt: host1(config-subif-atm-vc)#	■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.

Table 11: Command Mode Overview (continued)

Mode Name	Use of Mode	Access to Mode	Exit from Mode
Classifier Group Configuration	■ Configure classifier groups with policy rules used for policy lists.	■ To create a classifier group, from Policy List Configuration mode use the classifier-group command and identify the CLACL and precedence. ■ Prompt: host1(config-policy-list-classifier-group)#	■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Color Mark Profile Configuration	■ Configure packet color after exit from rate-limit hierarchy.	■ From Rate Limit Profile Configuration Mode, use the color-mark-profile command and identify the interface type (IP, IPv6, MPLS). ■ Prompt: host1(config-color-mark-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Control Plane Configuration	■ Configure SRP module policing.	■ From Global Configuration Mode, use the control-plane command. ■ Prompt: host1(config-control-plane)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Controller Configuration	■ Configure physical interfaces (for example, T3).	■ From Global Configuration mode, use the controller command. ■ Prompt: host1(config-controller)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
DHCP Local Pool Configuration	■ Configure DHCP local pools.	■ From Global Configuration mode, use the ip dhcp-local pool command. ■ Prompt: host1(config-dhcp-local)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Domain Map Configuration	■ Configure domain maps.	■ From Global Configuration mode, use the aaa domain-map command. ■ Prompt: host1(config-domain-map)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Domain Map Tunnel Configuration	■ Configure tunnel parameters.	■ From Domain-Map Configuration mode, use the tunnel command. ■ Prompt: host1(config-domain-map-tunnel)#	■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
DoS Protection Group Configuration	■ Configure parameters for DoS protection groups.	■ From Global Configuration Mode, use the dos-protection-group command. ■ Prompt: host1(config-dos-group)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Drop Profile Configuration	■ Configure drop profiles.	■ From Global Configuration mode, use the drop-profile command. ■ Prompt: host1(config-drop-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Explicit Path Configuration	■ Configure MPLS explicit path parameters.	■ From Global Configuration mode, specify the mpls explicit-path name command. ■ Prompt: host1(config-expl-path)#	■ Use the exit command to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.

Table 11: Command Mode Overview (continued)

Mode Name	Use of Mode	Access to Mode	Exit from Mode
Flow Cache Configuration	<ul style="list-style-type: none"> ■ Configure parameters for the aggregation cache. 	<ul style="list-style-type: none"> ■ From Global Configuration Mode, use the ip flow-aggregation cache command. ■ Prompt: host1(config-flow-cache)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Global Configuration	<ul style="list-style-type: none"> ■ Enable a feature or function. ■ Disable a feature or function. ■ Configure a feature or function. 	<ul style="list-style-type: none"> ■ From Privileged Exec mode, use the configure command. ■ Prompt: host1(config)# 	<ul style="list-style-type: none"> ■ Use the exit command, or press Ctrl + z to return to Exec mode. ■ Use the interface command to enter Interface Configuration mode.
Interface Configuration	<ul style="list-style-type: none"> ■ Create an interface. ■ Modify the operation of an interface, such as bandwidth or clock rate. 	<ul style="list-style-type: none"> ■ From Global Configuration mode, use the interface command and identify the interface by slot/port. ■ Prompt: host1(config-if)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
IP NAT Pool Configuration	<ul style="list-style-type: none"> ■ Create a NAT pool with a multiple, discontinuous range. 	<ul style="list-style-type: none"> ■ From Global Configuration mode, use the ip nat pool command and specify only a prefix length value. ■ Prompt: host1(config-ipnat-pool)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
IP PIM Data MDT Configuration	<ul style="list-style-type: none"> ■ Create and activate data multicast distribution trees (MDTs) 	<ul style="list-style-type: none"> ■ From Global Configuration mode, use the ip pim data-mdt command and specify a name. ■ Prompt: host1(config-ip-pim-data-mdt)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
IP Service Profile Configuration	<ul style="list-style-type: none"> ■ Create a service profile to use in route maps for subscriber management and to authenticate subscribers with RADIUS. 	<ul style="list-style-type: none"> ■ From Global Configuration mode, use the ip service-profile command and specify a service profile name with up to 32 ASCII characters. ■ Prompt: host1(config-service-profile)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
IPSec CA Identity Configuration	<ul style="list-style-type: none"> ■ Create an IPSec identity used in online certificate requests and during negotiations with IKE peers. 	<ul style="list-style-type: none"> ■ From the Global Configuration mode, use the ipsec ca identity command. ■ Prompt: host1(config-ca-identity)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
IPSec Identity Configuration	<ul style="list-style-type: none"> ■ Create an IPSec identity used in offline certificate requests and during negotiations with IKE peers. 	<ul style="list-style-type: none"> ■ From the Global Configuration mode, use the ipsec identity command. ■ Prompt: host1(config-ipsec-identity)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
IPSec IKE Policy Configuration	<ul style="list-style-type: none"> ■ Define an IKE policy. 	<ul style="list-style-type: none"> ■ From the Global Configuration mode, use the ipsec ike-policy-rule command. ■ Prompt: host1(config-ike-policy)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.

Table 11: Command Mode Overview (continued)

Mode Name	Use of Mode	Access to Mode	Exit from Mode
IPSec Manual Key Configuration	■ Enter manual keys.	■ From Global Configuration mode, use the ipsec key manual pre-share command. ■ Prompt: host1(config-manual-key)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
IPSec Peer Public Key Configuration	■ Enter an ISAKMP/IKE public key that a remote peer uses for RSA authentication without the need for a digital certificate.	■ From Global Configuration mode, use the ipsec key pubkey-chain rsa command. ■ Prompt: host1(config-peer-public-key)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
IPSec Transport Profile Configuration	■ Configure a profile for L2TP over IPSec.	■ From Global Configuration mode, use the ipsec transport profile command. ■ Prompt: host1(config-ipsec-transport-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
IPSec Tunnel Profile Configuration	■ Configure a profile for IPSec tunnels.	■ From Global Configuration mode, use the ipsec tunnel profile command. ■ Prompt: host1(config-ipsec-tunnel-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
IP Tunnel Destination Profile Configuration	■ Create a profile for dynamic GRE or DVMRP tunnels	■ From Global Configuration mode, use the gre destination profile command or the dvmrp destination profile command and specify a destination profile name. ■ Prompt: host1(config-dest-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
L2 Transport Load-Balancing-Circuit Configuration	■ Configure Martini layer 2 transport circuit associated with load-balancing group.	■ From Global Configuration mode, specify the mpls l2transport load-balancing-group command. ■ Prompt: host1(config-l2transport-load-balancing-circuit)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
L2TP Destination Profile Configuration	■ Define the location of an LAC.	■ From Global Configuration mode, use the l2tp destination profile command. ■ Prompt: host1(config-l2tp-dest-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
L2TP Destination Profile Host Configuration	■ Configure host profile attributes.	■ From L2TP Destination Profile Configuration mode, use the remote host command. ■ Prompt: host1(config-l2tp-dest-profile-host)#	■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.

Table 11: Command Mode Overview (continued)

Mode Name	Use of Mode	Access to Mode	Exit from Mode
L2TP Tunnel Switch Profile Configuration	■ Configure the L2TP tunnel switching behavior for interfaces to which this profile is assigned.	■ From Global Configuration mode, use the l2tp switch-profile command, and specify the name of the L2TP tunnel switch profile. ■ Prompt: host1(config-l2tp-tunnel-switch-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Layer 2 Control Configuration	■ Configure ANCP (L2C) parameters.	■ From Global Configuration mode, use the l2c command. ■ Prompt: host1(config-l2c)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Layer 2 Control Neighbor Configuration	■ Configure ANCP (L2C) neighbor parameters.	■ From Layer 2 Configuration mode, use the neighbor command. ■ Prompt: host1(config-l2c-neighbor)#	■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
LDP Configuration	■ Configure MPLS LDP profile parameters.	■ From Global Configuration mode, specify the mpls ldp profile command. ■ Prompt: host1(config-ldp)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Line Configuration	■ Modify a virtual terminal line.	■ From Global Configuration mode, use the line command. ■ Prompt: host1(config-line)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Local IPsec Transport Profile Configuration	■ Configure preshared IKE keys for L2TP over IPsec profiles.	■ From the IPsec Transport Profile Configuration mode, use the local ip address command. ■ Prompt: host1(config-ipsec-transport-profile-local)#	■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Local User Configuration	■ Configure user parameters in local user databases.	■ From Global Configuration mode, specify the aaa local username or the aaa local database command. ■ Prompt: host1(config-local-user)#	■ Use the exit command to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Map Class Configuration	■ Specify fragmentation for a map class.	■ From Global Configuration mode, specify the map-class frame-relay command. ■ Prompt: host1(config-map-class)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Map List Configuration	■ Configure map list parameters.	■ From Global Configuration mode, use the map-list command. ■ Prompt: host1(config-map-list)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.

Table 11: Command Mode Overview (continued)

Mode Name	Use of Mode	Access to Mode	Exit from Mode
Parent Group Configuration	■ Configure an external parent group.	■ From Global Configuration mode, use the parent-group command. ■ Prompt: host1(config-parent-group)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Policy List Configuration	■ Configure policy lists.	■ To create a policy list, from Global Configuration mode use the policy-list command and identify the type of policy list. ■ Prompt: host1(config-policy-list)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Policy List Parent Group Configuration	■ Configure an internal parent group in a hierarchy.	■ From Global Configuration Mode, use the policy-list command to create or access a policy list. From Policy List Configuration Mode, use the parent-group command. ■ Prompt: host1(config-policy-list-parent-group)#	■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Policy Parameter Configuration	■ Configure a policy parameter.	■ From Global Configuration mode, use the policy-parameter command. ■ Prompt: host1(config-policy-parameter)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
PPPoE Service Name Table Configuration	■ Configure services for a PPPoE service name table.	■ From Global Configuration mode, use the pppoe-service-name-table command, and specify the alphanumeric name of the PPPoE service name table. ■ Prompt: host1(config-pppoe-service-name-table)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Privileged Exec	■ Show system information. ■ Set operating parameters. ■ Access Global Configuration mode.	■ From User Exec mode, use the enable command. ■ Prompt: host1#	■ Use the disable command to return to User Exec mode. ■ Use the exit command to log out of the CLI. ■ Use the configure command to enter Global Configuration mode.
Profile Configuration	■ Configure profiles.	■ From Global Configuration mode, use the profile command. ■ Prompt: host1(config-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
QoS Parameter Definition Configuration	■ Configure QoS parameter definitions.	■ From Global Configuration mode, use the qos-parameter-define command. ■ Prompt: host1(config-qos-parameter-define)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.

Table 11: Command Mode Overview (continued)

Mode Name	Use of Mode	Access to Mode	Exit from Mode
QoS Profile Configuration	■ Configure QoS profiles.	■ From Global Configuration mode, use the qos-profile command. ■ Prompt: host1(config-qos-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
QoS Shared Shaper Control Configuration	■ Configure variables within the simple shared shaper algorithm.	■ From Global Configuration mode, use the qos-shared-shaper-control command. ■ Prompt: host1(config-qos-shared-shaper-control)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Queue Profile Configuration	■ Configure queue profiles.	■ From Global Configuration mode, use the queue-profile command. ■ Prompt: host1(config-queue)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
RADIUS Configuration	■ Configure Broadband Remote Access Server (B-RAS) parameters.	■ From Global Configuration mode, use the radius server command. ■ Prompt: host1(config-radius)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
RADIUS Relay Configuration	■ Configure RADIUS relay server parameters.	■ From Global Configuration mode, use the radius relay server command. ■ Prompt: host1(config-radius-relay)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Rate Limit Profile Configuration	■ Configure an IP or L2TP rate limit parameters.	■ To create an IP rate limit profile, from Global Configuration mode use the ip rate-limit-profile command. ■ To create an L2TP rate limit profile, from Global Configuration mode use the l2tp rate-limit-profile command. ■ Prompt: host1(config-rate-limit-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Redundancy Configuration	■ Configure high availability (stateful SRP switchover).	■ From Global Configuration mode, use the redundancy command. ■ Prompt: host1(config-redundancy)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Remote Neighbor Configuration	■ Configure remote neighbor parameters for OSPF, PIM, or RIP.	■ From Router Configuration mode, use the remote-neighbor command. ■ Prompt: host1(config-router-rn)#	■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Route Map Configuration	■ Configure routing tables and source and destination information.	■ From Global Configuration mode, use the route-map command. ■ Prompt: host1(config-route-map)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.

Table 11: Command Mode Overview (continued)

Mode Name	Use of Mode	Access to Mode	Exit from Mode
Router Configuration	■ Configure a routing protocol.	■ From Global Configuration mode, specify a routing protocol with the router command. ■ Prompt: host1(config-router)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
RSVP Configuration	■ Configure an RSVP profile.	■ From Global Configuration mode, use the mpls rsvp profile command. ■ Prompt: host1(config-rsvp)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
RTR Configuration	■ Configure RTR parameters.	■ From Global Configuration mode, use the rtr command. ■ Prompt: host1(config-rtr)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Scheduler Profile Configuration	■ Configure shaping parameters. ■ Configure scheduler profiles.	■ From Global Configuration mode, use the scheduler-profile command. ■ Prompt: host1(config-scheduler-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec menu.
Service Session Profile Configuration	■ Configure attributes for Service Manager service session profiles.	■ From Global Configuration mode, use the service-management service-session-profile command. ■ Prompt: host1(config-service-session-profile)#	■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
SNMP Event Manager Configuration	■ Configure SNMP events.	■ From Global Configuration mode, use the snmp-server management-event command. ■ Prompt: host1(config-mgmtevent)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec menu.
Statistics Profile Configuration	■ Configure statistics profiles.	■ From Global Configuration mode, use the statistics-profile command. ■ Prompt: host1(config-statistics-profile)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec menu.
Subinterface Configuration	■ Configure multiple virtual interfaces on a single physical interface.	■ From Global Configuration mode, use the interface command and identify the interface (slot/port.subinterface). ■ Prompt: host1(config-subif)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Subscriber Policy Configuration	■ Configure a nondefault subscriber policy for a subscriber (client) bridge group interface.	■ From Global Configuration mode, use the subscriber-policy command and specify the alphanumeric name of the subscriber policy. ■ Prompt: host1(config-policy)#	■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.

Table 11: Command Mode Overview (continued)

Mode Name	Use of Mode	Access to Mode	Exit from Mode
Traffic Class Configuration	<ul style="list-style-type: none"> ■ Configure a traffic class. 	<ul style="list-style-type: none"> ■ From Global Configuration mode, use the traffic-class command. ■ Prompt: host1(config-traffic-class)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Traffic Class Group Configuration	<ul style="list-style-type: none"> ■ Configure a traffic class group. 	<ul style="list-style-type: none"> ■ From Global Configuration mode, use the traffic-class-group command. ■ Prompt: host1(config-traffic-class-group)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Tunnel Group Configuration	<ul style="list-style-type: none"> ■ Add up to 31 tunnel definitions to a tunnel group. 	<ul style="list-style-type: none"> ■ From Global Configuration mode, use the aaa tunnel-group command and specify the name of the tunnel. ■ Prompt: host1(config-tunnel-group)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Tunnel Group Tunnel Configuration	<ul style="list-style-type: none"> ■ Configure attributes for a tunnel group tunnel. 	<ul style="list-style-type: none"> ■ From Tunnel Group Configuration mode, use the tunnel command and specify the tag value (1-31) of the tunnel. ■ Prompt: host1(config-tunnel-group-tunnel)# 	<ul style="list-style-type: none"> ■ Use the exit command twice to return to Global Configuration Mode. ■ Press Ctrl + z to return to Exec mode.
Tunnel Profile Configuration	<ul style="list-style-type: none"> ■ Configure tunnel profile parameters. 	<ul style="list-style-type: none"> ■ From Global Configuration mode, specify the mpls tunnels profile command. ■ Prompt: host1(config-tunnelprofile)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
Tunnel Server Configuration	<ul style="list-style-type: none"> ■ Configure the maximum number of tunnel-service interfaces for a dynamic tunnel-server port. 	<ul style="list-style-type: none"> ■ From Global Configuration mode, use the tunnel-server command and identify the slot/port location of the dynamic tunnel-server port. ■ Prompt: host1(config-tunnel-server)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
User Exec	<ul style="list-style-type: none"> ■ Change terminal settings on a temporary basis. ■ Show system information. ■ Access Privileged Exec mode. 	<ul style="list-style-type: none"> ■ Log into system. ■ Prompt: host1> 	<ul style="list-style-type: none"> ■ Use the enable command to enter Privileged Exec mode. ■ Use the exit command to log out of the CLI.
VRF Configuration	<ul style="list-style-type: none"> ■ Configure VRF parameters for BGP/MPLS VPNs. 	<ul style="list-style-type: none"> ■ From Global Configuration mode, use the ip vrf command. ■ Prompt: host1(config-vrf)# 	<ul style="list-style-type: none"> ■ Use the exit command once to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.
VR Group Configuration	<ul style="list-style-type: none"> ■ Configure a virtual router group for AAA broadcast accounting. 	<ul style="list-style-type: none"> ■ From Global Configuration mode, use aaa accounting vr-group to enter VR Group Configuration mode. ■ Prompt: host1(config-vr-group)# 	<ul style="list-style-type: none"> ■ Use the exit command twice to return to Global Configuration mode. ■ Press Ctrl + z to return to Exec mode.



NOTE: Within any configuration mode, the commands that are available to the user include the commands defined for that configuration mode and all commands defined for Global Configuration mode. See Figure 21 on page 29. For example, from Router Configuration mode, you could use the **interface** Global Configuration mode command without first explicitly going back to Global Configuration mode.

```
host1(router-config)# interface atm 4/0.3
host1(config-if)#
```

Exec Modes

There are two Exec modes: User Exec and Privileged Exec.

After you log in to the system, the CLI is in User Exec mode. By default, the commands you can execute from User Exec mode provide only user-level access; however, you should password protect it to prevent unauthorized use. The User Exec commands allow you to perform such functions as:

- Change terminal settings on a temporary basis.
- Perform **ping** and **trace** commands.
- Display system information.

```
host1>?
clear          Clear system information
default        Set a command to its default(s)
dir            Display a list of local files
disable        Reduce the command privilege level
enable         Enable access to privileged commands
erase          Erase configuration settings
exit           Exit from the current command mode
flash-disk     Perform flash disk operations
help           Describe the interactive help system
ip             Configure IP attributes on an interface
ipv6           Configure IPv6 attributes
l2tp           L2TP operations
macro          Run a CLI macro
mpls           Execute MPLS commands
mtrace         Trace the path that packets will traverse from source to
               destination for a given group
no             Negate a command or set its default(s)
ping           Send echo request to remote host
show           Display system information
sleep          Make the Command Interface pause for a specified duration
terminal       Configure the terminal line settings
test           Test the outcome of a command
traceroute     Trace the path that packets traverse to their destination
```

Privileged Exec mode provides privileged-level access and therefore should also be password protected to prevent unauthorized use. Privileged Exec commands allow you to perform such functions as:

- Display system information.
- Set operating parameters.
- Gain access to Global Configuration mode.

Password Protection

If the system administrator has configured the system to have a password, the CLI prompts you to enter that password before you receive access to Privileged Exec mode. The password is case sensitive and appears as asterisks on the screen.

To access Privileged Exec mode:

1. At the prompt, type **enable** and press Enter.

```
host1>enable
Password:
```

2. At the password prompt, type your password and press Enter.

```
Password:*****
host1#
```



NOTE: The > character in the command-line prompt changes to the # character.

```
host1#?
baseline      Set a baseline for statistics
clear         Clear a state
clock         Set the system's clock
configure     Enter Global Configuration mode
copy          Copy files
debug         Configure debugging functions
default       Set a command to its default(s)
delete        Delete a local file
dir           Display a list of local files
disable       Reduce the command privilege level
disconnect    Disconnect remote CLI session
enable        Enable access to privileged commands
exit          Exit from the current command mode
flash-disk    Perform flash disk operations
halt          Halt the system in preparation for power down
help          Describe the interactive help system
ip            Configure IP attributes on an interface
ipv6          Configure IPv6 attributes
l2tp          L2TP operations
log           Configure logging settings
logout        Logout PPP Subscribers
macro         Run a CLI macro
more          Display contents of a file
mpls          Execute MPLS commands
mtrace        Trace the path that packets will traverse from source to
               destination for a given group
```

no	Negate a command or set its default(s)
ping	Send echo request to remote host
pppoe	Set PPPoE information
profile-reassign	Perform profile reassignment
redundancy	Perform a redundancy action
reload	Halt and perform a cold restart
rename	Rename a local file
send	Send a message to specified lines
show	Display system information
sleep	Make the Command Interface pause for a specified duration
srp	Perform SRP operations
synchronize	Manually synchronize redundant system controller file system
telnet	Access a remote system via telnet
terminal	Configure the terminal line settings
test	Test the outcome of a command
tracert	Trace the path that packets traverse to their destination
undebg	Disable debug logging functions
virtual-router	Specify a virtual router
write	Write the system's running configuration to a destination

In addition, you can execute a script file (.scr), which is simply a file containing a sequence of CLI commands, through the **configure** command.

Global Configuration Mode

Within Global Configuration mode, you can:

- Apply features globally to a router.
- Enable a feature or function.
- Disable a feature or function.
- Configure a feature or function.
- Access all Configuration modes.

To access Global Configuration mode, you begin in Privileged Exec mode. Type **configure terminal** and press Enter.

```
host1#configure terminal
Enter configuration commands, one per line. End with ^Z.
host1(config)#
```

The system is now in Global Configuration mode.

Executing a Script File

To execute a script file:

1. From Privileged Exec mode, type **configure** and the filename you want to execute, and press Enter.

```
host1#configure file
File name:/myFile.scr
Proceed with configure? [confirm]
```



NOTE: The filename must end with an .scr extension, and the file must contain a series of valid CLI commands. The file can be a local file on the router or a remote file on a host system.

2. Press **y** or Enter to confirm; pressing any other key aborts the procedure.

host1#

For more information, see the section *Managing Files* in *Chapter 5, Managing the System*.

AAA Profile Configuration Mode

From this mode, you can restrict or allow the use of domain names, translate an original domain name to a new domain name, or create domain name aliases.

From Global Configuration mode, type the **aaa profile** command and a *profileName*, and then press Enter.

```
host1(config)#aaa profile charlie
host1(config-aaa-profile)#?
allow      Configure the authorization domain name
default    Set a command to its default(s)
deny       Configure the authorization domain name
do         Run an exec mode command (alias command run)
exit       Exit from the current command mode
help       Describe the interactive help system
log        Configure logging settings
macro      Run a CLI macro
no         Negate a command or set its default(s)
run        Run an exec mode command (alias command do)
sleep      Make the Command Interface pause for a specified duration
translate  Configure the translation map for domain name
```

Address Family Configuration Mode

From this mode, you can configure address family parameters for BGP VPN services or RIP VPN services.

From Global Configuration mode, type the **router bgp** command to enter Router Configuration mode for BGP. Type either the **address-family ipv4** or **address-family vpnv4** command, and then press Enter.

```
host1(config)#router bgp 100
host1(config-router)#address-family ?
ipv4    Configure IPv4 address family
vpnv4   Configure VPN-IPv4 address family
```

From Global Configuration mode, type the **router rip** command to enter Router Configuration mode for RIP. Type the **address-family ipv4** command, and then press Enter.

```
host1(config)#router rip 100
host1(config-router)#address-family ?
ipv4    Configure IPv4 address family
```

ATM VC Configuration Mode

In this mode, you can configure individual attributes for an ATM data PVC. These attributes include the service category, encapsulation method, Inverse Address Resolution Protocol (Inverse ARP), and F5 Operation, Administration, and Management (OAM) parameters.

From Global Configuration mode, type the **interface** command and specify the ATM subinterface identifier to enter Subinterface Configuration mode. From Subinterface Configuration mode, type the **pvc** command and specify the virtual circuit descriptor (VCD), virtual path identifier (VPI) and virtual circuit identifier (VCI) values (in the format *vpi/vci*), and then press Enter.

```
host1(config)#interface atm 3/2.1
host1(config-subif)#pvc 100 0/100
host1(config-subif-atm-vc)#?
  cbr          Configure the Constant Bit Rate (CBR) service class
  class-vc     Assign a Virtual Circuit class to the Permanent Virtual
               Circuit
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  encapsulation Configure the ATM encapsulation
  exit         Exit from the current command mode
  help         Describe the interactive help system
  inarp        Configure the Inverse Address Resolution Protocol (InARP)
               protocol
  log          Configure logging settings
  macro        Run a CLI macro
  no           Negate a command or set its default(s)
  oam          Configure Operations, Administration, and Management (OAM)
  oam-pvc      Configure Operations, Administration, and Management (OAM) for
               Permanent Virtual Circuit (PVC)
  run          Run an exec mode command (alias command do)
  sleep        Make the Command Interface pause for a specified duration
  ubr          Configure the Unspecified Bit Rate (UBR) service class
  vbr-nrt      Configure the Variable Bit Rate Non-Real Time (VBR-nrt)
               service class
  vbr-rt       Configure the Variable Bit Rate Real Time (VBR-rt) service
               class
```

ATM VC Class Configuration Mode

In this mode, you can configure a class of attributes for an ATM data PVC. The VC class can include attributes for the service category, encapsulation method, F5 OAM options, and Inverse ARP. You then apply the set of attributes as a group by assigning the VC class to an individual PVC, to all PVCs created on a specified ATM major interface, to all PVCs created on a specified ATM 1483 subinterface, or to a base profile from which bulk-configured VC ranges are dynamically created.

From Global Configuration mode, type the **vc-class atm** command followed by an alphanumeric VC class name of up to 32 characters, and press Enter.

```
host1(config)#vc-class atm premium-subscriber-class
host1(config-vc-class)#?
  cbr          Configure the Constant Bit Rate (CBR) service class
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  encapsulation Configure the ATM encapsulation
  exit         Exit from the current command mode
  help         Describe the interactive help system
```

<code>inarp</code>	Configure the Inverse Address Resolution Protocol (InARP) protocol
<code>log</code>	Configure logging settings
<code>macro</code>	Run a CLI macro
<code>no</code>	Negate a command or set its default(s)
<code>oam</code>	Configure Operations, Administration, and Management (OAM)
<code>oam-pvc</code>	Configure Operations, Administration, and Management (OAM) for Permanent Virtual Circuit (PVC)
<code>run</code>	Run an exec mode command (alias command <code>do</code>)
<code>sleep</code>	Make the Command Interface pause for a specified duration
<code>ubr</code>	Configure the Unspecified Bit Rate (UBR) service class
<code>vbr-nrt</code>	Configure the Variable Bit Rate Non-Real Time (VBR-nrt) service class
<code>vbr-rt</code>	Configure the Variable Bit Rate Real Time (VBR-rt) service class

Classifier Group Configuration Mode

In this mode, you can configure the set of rules for a classification group in a policy list that you can attach to an interface.

From Policy List Configuration mode, type the **classifier-group** command and its attributes, and then press Enter.

```

host1(config-policy-list)#classifier-group ipCLACL10 precedence 75
host1(config-policy-list-classifier-group)#?
  color          Create a color policy
  default        Set a command to its default(s)
  do             Run an exec mode command (alias command run)
  exit          Exit from the current command mode
  filter        Create a filter policy
  forward       Create a forward policy
  help          Describe the interactive help system
  log           Configure logging settings
  macro         Run a CLI macro
  mark          Create a set TOS byte policy
  next-hop      Create a next-hop policy
  next-interface Create a next-interface policy
  no            Negate a command or set its default(s)
  rate-limit-profile Create a rate-limit policy
  run           Run an exec mode command (alias command do)
  sleep         Make the Command Interface pause for a specified duration
  suspend       Suspend a policy rule
  traffic-class Create a traffic class policy
  user-packet-class Create a user packet class policy

```

Color Mark Profile Configuration Mode

In this mode, you can configure translation for a color to a type-dependent mark for TOS or EXP for an IP, IPv6 or MPLS interface.

From Rate Limit Profile Configuration mode, type the **color-mark-profile** command and specify a *profileName*, and then press Enter.

```

host1(config-rate-limit-profile)#mpls color-mark-profile myprofile
host1(config-color-mark-profile)#?
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  exit        Exit from the current command mode

```



```

green-mark  Apply TOS mark to IP packets classified Green by the rate limit
             hierarchy
help        Describe the interactive help system
log         Configure logging settings
macro       Run a CLI macro
mask-value  Mask for all TOS values applied by the color-mark profile
no          Negate a command or set its default(s)
red-mark    Apply TOS mark to IP packets classified Red by the rate limit
             hierarchy
run         Run an exec mode command (alias command do)
sleep       Make the Command Interface pause for a specified duration
yellow-mark Apply TOS mark to IP packets classified Yellow by the rate limit
             hierarchy

```

Control Plane Configuration Mode

In this mode, you can configure policing for a specific protocol.

From Global Configuration mode, type the **control-plane** command and press Enter.

```

host1(config)#control-plane
host1(config-control-plane)#?
default  Set a command to its default(s)
do       Run an exec mode command (alias command run)
exit     Exit from the current command mode
help     Describe the interactive help system
log      Configure logging settings
macro    Run a CLI macro
no       Negate a command or set its default(s)
policer  Configure policing
run      Run an exec mode command (alias command do)
sleep    Make the Command Interface pause for a specified duration

```

Controller Configuration Mode

You can configure physical interfaces such as a T3 in Controller Configuration mode.

From Global Configuration mode, type the appropriate **controller** command and its attributes, and then press Enter.

```

host1(config)#controller t3 9/1
host1(config-controller)#

host1(config)#controller ?
e1    Configure a channelized E1 controller
e3    Configure a E3 controller
sonet Configure a Sonet controller
t1    Configure a channelized T1 controller
t3    Configure a T3 controller

```

DHCP Local Pool Configuration Mode

In this mode, you can configure DHCP local pools. For example, you can specify a DNS or NetBIOS server.

From Global Configuration mode, type the command **ip dhcp-local pool** and a *poolName*, and then press Enter.

```

host1(config)#ip dhcp-local pool charlie
host1(config-dhcp-local)#?
  default          Set a command to its default(s)
  default-router   The default-router to use for this pool
  dns-server       The dns-server to use for this pool
  do               Run an exec mode command (alias command run)
  domain-name      The domain name for the pool
  exit             Exit from the current command mode
  grace-period     The grace period to be applied to leases
  help             Describe the interactive help system
  lease            The lease time for addresses from this pool
  link             Link to another DHCP Pool
  log              Configure logging settings
  macro            Run a CLI macro
  netbios-name-server The netbios-name-server to use for this pool
  netbios-node-type The netbios-node-type to use for this pool
  network          The network specified for this pool
  no               Negate a command or set its default(s)
  reserve          Reserve an ip address for a specific Mac Address
  run              Run an exec mode command (alias command do)
  server-address   The DHCP Server address to send to clients
  sleep            Make the Command Interface pause for a specified
                  duration
  snmpTrap         Enable snmp pool utilization traps
  use-release-grace-period Apply the grace period to released leases
  warning          Configure utilization warnings

```

Domain Map Configuration Mode

In this mode, you can map a user domain name to a virtual router and loopback interface.

From Global Configuration mode, type the **aaa domain-map** command and the domain name value as found in the client's login name. Then press Enter.

```

host1(config)#aaa domain-map charlie76
host1(config-domain-map)#?
  address-pool-name Configure the address-pool-name for the domain name
  atm               Configure ATM parameters
  default           Set a command to its default(s)
  do                Run an exec mode command (alias command run)
  exit             Exit from the current command mode
  help             Describe the interactive help system
  ip-hint           Configure the IP hint feature for the domain
  local-interface   Configure the local interface value for remote clients
  log              Configure logging settings
  loopback          Configure the loopback interface to use when RX has an
                  unnumbered interface to the PPP client
  macro            Run a CLI macro
  no               Negate a command or set its default(s)
  override-user     Configure the username and password values to use instead
                  of the values from the remote client
  padn             Configure pppoe active discovery network parameters for
                  the domain name
  router-name       Configure the virtual-router for the domain name
  run              Run an exec mode command (alias command do)
  sleep            Make the Command Interface pause for a specified duration
  strip-domain      Configure the domain name stripping feature for the domain
  tunnel           Configure tunnel tag
  virtual-router    Configure the virtual-router for the domain name

```

Domain Map Tunnel Configuration Mode

In this mode, you can configure tunnel parameters such as the tunnel's endpoint.

From Domain-Map Configuration mode, type **tunnel** and a *tunnelNumber*, and press Enter.

```
host1(config-domain-map)#tunnel 17
host1(config-domain-map-tunnel)#?
  address          Configure tunnel endpoint address
  client-name      Configure the client hostname of the tunnel
  default          Set a command to its default(s)
  exit             Exit from the current command mode
  do               Run an exec mode command (alias command run)
  help            Describe the interactive help system
  hostname         Configure the client hostname of the tunnel
  identification    Configure tunnel identification
  log              Configure logging settings
  macro            Run a CLI macro
  max-sessions     Configure maximum sessions for this tunnel
  medium           Configure tunnel medium
  no               Negate a command or set its default(s)
  password         Configure tunnel password
  preference       Configure tunnel preference
  run              Run an exec mode command (alias command do)
  server-name      Configure the remote hostname for the tunnel
  sleep            Make the Command Interface pause for a specified duration
  source-address   Configure tunnel source address
  type             Configure tunnel type
```

DoS Protection Group Configuration Mode

In this mode, you can configure parameters for Denial of Service (DoS) protection groups.

From Global Configuration mode, type the **dos-protection-group** command and press Enter.

```
host1(config)#dos-protection-group
host1(config-dos-protection)#?
  default          Set a command to its default(s)
  do               Run an exec mode command (alias command run)
  exit             Exit from the current command mode
  help            Describe the interactive help system
  log              Configure logging settings
  macro            Run a CLI macro
  no               Negate a command or set its default(s)
  priority          Specify the priority
  protocol          Specify the protocol
  run              Run an exec mode command (alias command do)
  sleep            Make the Command Interface pause for a specified duration
  use              Configure usagehost1(config-dos-protection-group)#?
```

Drop Profile Configuration Mode

In this mode, you can configure drop profiles for QoS. Drop profiles control RED dropping behavior.

From Global Configuration mode, type the **drop-profile** command, and press Enter.

```
host1(config)#drop profile
host1(config-drop-profile)#?
  average-length-exponent  Select TAQL coefficient
  committed-threshold      Specify committed queue thresholds and maximum drop
                           probability
  conformed-threshold      Specify conformed queue thresholds and maximum drop
                           probability
  default                  Set a command to its default(s)
  do                       Run an exec mode command (alias command run)
  exceeded-threshold       Specify exceeded queue thresholds and maximum drop
                           probability
  exit                    Exit from the current command mode
  help                    Describe the interactive help system
  log                     Configure logging settings
  macro                   Run a CLI macro
  no                      Negate a command or set its default(s)
  run                     Run an exec mode command (alias command do)
  sleep                   Make the Command Interface pause for a specified duration
```

Explicit Path Configuration Mode

From this mode, you can name and configure an explicit path within MPLS.

From Global Configuration mode, type **mpls explicit-path name** and the *explicitPathName*, and press Enter.

```
host1(config)#mpls explicit-path name xyz
host1(config-exp1-path)#?
  append-after  Add an entry after a specified index
  default       Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  exit        Exit from the current command mode
  help       Describe the interactive help system
  index      Specify the index of the entry to be added or edited
  list       List part or all of the entries in current explicit path
  log        Configure logging settings
  macro      Run a CLI macro
  next-address  Configure an IP address at the last hop of the explicit path
  no         Negate a command or set its default(s)
  run        Run an exec mode command (alias command do)
  sleep      Make the Command Interface pause for a specified duration
```

Flow Cache Configuration Mode

In this mode, you can configure parameters for the aggregation cache.

From Global Configuration mode, type the **ip flow-aggregation cache** command and press Enter.

```
host1(config)#ip flow-aggregation cache
host1(config-flow-cache)#?
  cache  Configure Flow Stats cache parameters
```

```

default  Set a command to its default(s)
do       Run an exec mode command (alias command run)
enabled  Start flow cache operation
exit     Exit from the current command mode
export   Configure Flow-Cache export parameters
help     Describe the interactive help system
log      Configure logging settings
macro    Run a CLI macro
no       Negate a command or set its default(s)
run      Run an exec mode command (alias command do)
sleep    Make the Command Interface pause for a specified duration

```

Interface Configuration Mode

From Interface Configuration mode, you can enable many system features for each interface you create. Interface Configuration commands allow you to:

- Create an interface.
- Modify the operation of an interface.
- Access Subinterface Configuration mode.

From Global Configuration mode, type **interface** and identify the interface you want to configure and press Enter.

```

host1(config)#interface atm 0/1
host1(config-if)#

```

The CLI is now in Interface Configuration mode.

```

host1(config)#interface ?
atm                ATM interface
fastEthernet       IEEE 802.3 fastEthernet interface
gigabitEthernet    IEEE 802.3 gigabitEthernet interface
hssi               High Speed Serial interface
ip                 Ip shared interface
ipv6               Ipv6 shared interface
lag                Link Aggregation interface
loopback           Loopback interface
mlframe-relay      Multilink frame-relay interface
mlppp              Multilink PPP interface
null               Null interface
pos                Packet over SONET interface
serial             Serial interface
tunnel             Tunnel interface

```

Some Interface Configuration commands can affect general interface parameters, such as bandwidth and clock rate. For interface-specific commands, such as commands for ATM interfaces, see the appropriate chapter in this documentation set.



NOTE: Although it appears in the list of configurable interfaces, you cannot configure any values on a null interface. For information about using the null interface, see *JUNOS IP Services Configuration Guide, Chapter 1, Configuring Routing Policy*.

IP NAT Pool Configuration Mode

In this mode, you can specify the information that the system uses in creating IP Network Address Translation (NAT) pools. From Global Configuration mode, type **ip nat pool multiplerange prefix-length** and press Enter.

```
host1(config)#ip nat pool multiplerange prefix-length 30
host1(config-ipnat-pool)#?
address  Configure address ranges
default  Set a command to its default(s)
do       Run an exec mode command (alias command run)
exit     Exit from the current command mode
help     Describe the interactive help system
log      Configure logging settings
macro    Run a CLI macro
no       Negate a command or set its default(s)
run      Run an exec mode command (alias command do)
sleep    Make the Command Interface pause for a specified duration
```

IP PIM Data MDT Configuration Mode

In this mode, you can specify parameters for data MDTs. From Global Configuration mode, type **ip pim data-mdt**, and press Enter:

```
host1:pe1:pe13(config)#ip pim data-mdt
host1:western:eastern(config-ip-pim-data-mdt)#?
default      Set a command to its default(s)
do           Run an exec mode command (alias command run)
exit         Exit from the current command mode
help         Describe the interactive help system
log          Configure logging settings
macro        Run a CLI macro
mdt-data-delay  Configure MDT_DATA_DELAY timeout
mdt-data-holdown  Configure MDT_DATA_HOLDOWN timeout
mdt-data-timeout  Configure MDT_DATA_TIMEOUT
mdt-interval   Configure MDT_INTERVAL timer
no           Negate a command or set its default(s)
route-map     Configure route-map
run          Run an exec mode command (alias command do)
sleep        Make the Command Interface pause for a specified duration
tunnel       Configure tunnel parameters
```

IP Service Profile Configuration Mode

In this mode, you can specify the information that the system uses in creating IP service profiles.

From Global Configuration mode, type **ip service-profile** and the service profile name, and press Enter.

```
host1(config)#ip service-profile radius
host1(config-service-profile)#?
default      Set a command to its default(s)
do           Run an exec mode command (alias command run)
domain       Configure a username domain
exit         Exit from the current command mode
help         Describe the interactive help system
include      Configure an attribute to be included in a username
log          Configure logging settings
```

macro	Run a CLI macro
no	Negate a command or set its default(s)
password	Configure a user password
run	Run an exec mode command (alias command do)
sleep	Make the Command Interface pause for a specified duration
user-name	Configure a user name
user-prefix	Configure a username prefix

IPSec CA Identity Configuration Mode

In this mode, you can specify the information that the system uses in online certificate requests and during negotiations with its peers.

From Global Configuration mode, type **ipsec ca identity**, and press Enter.

```
host1(config)#ipsec ca identity
host1(config-ca-identity)#?
  crl                Certificate Revocation List checking
  default            Set a command to its default(s)
  do                 Run an exec mode command (alias command run)
  enrollment         Configure enrollment parameters
  exit              Exit from the current command mode
  help              Describe the interactive help system
  issuer-identifier  issuer identifier
  log               Configure logging settings
  macro             Run a CLI macro
  no                Negate a command or set its default(s)
  root              Specify root proxy
  run               Run an exec mode command (alias command do)
  sleep             Make the Command Interface pause for a specified
```

IPSec Identity Configuration Mode

In this mode, you can specify the information that the system uses in offline certificate requests and during negotiations with its peers.

From Global Configuration mode, type **ipsec identity**, and press Enter.

```
host1(config)#ipsec identity
host1(config-ipsec-identity)#?
  common-name        Common Name
  country            Country name
  default            Set a command to its default(s)
  do                 Run an exec mode command (alias command run)
  domain-name        Domain name
  exit              Exit from the current command mode
  help              Describe the interactive help system
  log               Configure logging settings
  macro             Run a CLI macro
  no                Negate a command or set its default(s)
  organization       Organization name
  run               Run an exec mode command (alias command do)
  sleep             Make the Command Interface pause for a specified duration
```

IPSec IKE Policy Configuration Mode

In this mode, you can create an IKE policy, which is used during IKE phase 1 negotiation.

From the Global Configuration mode, type **ipsec ike-policy-rule** and the *policyNumber*, and press Enter.

```
host1(config)#ipsec ike-policy-rule 10
host1(config-ike-policy)#?
  aggressive-mode  Allows aggressive mode negotiation for the tunnel
  authentication   Configure the authentication method
  default          Set a command to its default(s)
  do              Run an exec mode command (alias command run)
  encryption       Configure the encryption algorithm within an IKE policy
  exit            Exit from the current command mode
  group            Configure the Diffie-Hellman group identifier
  hash             Configure the hash algorithm within an IKE policy
  help            Describe the interactive help system
  lifetime         Configure the time an SA will live before expiration
  log              Configure logging settings
  macro            Run a CLI macro
  no               Negate a command or set its default(s)
  run              Run an exec mode command (alias command do)
  sleep           Make the Command Interface pause for a specified duration
```

IPSec Manual Key Configuration Mode

In this mode, you can enter the manual key that a peer uses for authentication during the tunnel establishment phase.

From the Global Configuration mode, type **ipsec key manual pre-share** and the *peerIPAddress*, and press Enter.

```
host1(config)#ipsec key manual pre-share 10.10.1.1
host1(config-manual-key)#?
  default          Set a command to its default(s)
  do              Run an exec mode command (alias command run)
  exit            Exit from the current command mode
  help            Describe the interactive help system
  key             Manually specify a key
  log              Configure logging settings
  macro            Run a CLI macro
  masked-key       Enter a masked key (not for manual entry, show config generates)
  no               Negate a command or set its default(s)
  run              Run an exec mode command (alias command do)
  sleep           Make the Command Interface pause for a specified duration
```


IPSec Peer Public Key Configuration Mode

In this mode, you can configure the ISAKMP/IKE public key that a remote peer uses for RSA authentication during the tunnel establishment phase without the need for a digital certificate.

From Global Configuration mode, type **ipsec key pubkey-chain rsa** and either the IP address or fully qualified domain name of the remote peer, and press Enter.

```
host1(config)#ipsec key pubkey-chain rsa address 192.168.50.5
host1(config-peer-public-key)#?
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  exit         Exit from the current command mode
  help         Describe the interactive help system
  key-string   Enter key string
  log          Configure logging settings
  macro        Run a CLI macro
  no           Negate a command or set its default(s)
  run          Run an exec mode command (alias command do)
  sleep        Make the Command Interface pause for a specified duration
```

IPSec Transport Profile Configuration Mode

In this mode, you can configure an IP Security (IPSec) transport profile, which is used for Layer 2 Tunneling Protocol (L2TP) over IPSec connections.

From the Global Configuration mode, type **ipsec transport profile**, the *profileName*, **virtual-router** *vrName*, **ip address** *ipAddress*, and press Enter.

```
host1(config)#ipsec transport profile secureL2tp virtual-router default ip address 0.0.0.0
host1(config-ipsec-transport-profile)#?
  application  Configure the application type that is protected by the l2tp
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  exit         Exit from the current command mode
  help         Describe the interactive help system
  lifetime     Configure the renegotiation time
  local        Configure local endpoint of the transport connection
  log          Configure logging settings
  macro        Run a CLI macro
  no           Negate a command or set its default(s)
  pfs          Configure perfect forward secrecy
  run          Run an exec mode command (alias command do)
  sleep        Make the Command Interface pause for a specified duration
  transform-set Configure the transform set used by ipsec transport profile
```

IPSec Tunnel Profile Configuration Mode

In this mode, you can configure a profile of an IPSec tunnel.

From Global Configuration mode, type **ipsec tunnel profile** and the *profileName*, and press Enter.

```
host1(config)#ipsec tunnel profile profile1
host1(config-ipsec-tunnel-profile)#?
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  domain-suffix Configure a domain suffix to be appended to users on
               this profile
```

<code>exit</code>	Exit from the current command mode
<code>extended-authentication</code>	Configure extended authentication parameters
<code>help</code>	Describe the interactive help system
<code>ike</code>	Configure IKE characteristics
<code>ip</code>	Configure local IP characteristics
<code>lifetime</code>	Configure the phase 2 life parameters
<code>local</code>	Configure local characteristics
<code>log</code>	Configure logging settings
<code>macro</code>	Run a CLI macro
<code>max-interfaces</code>	Configure the maximum allowed dynamic interface instantiations
<code>no</code>	Negate a command or set its default(s)
<code>peer</code>	Configure peer characteristics
<code>pfs</code>	Configure the phase 2 perfect forward secrecy
<code>run</code>	Run an exec mode command (alias command <code>do</code>)
<code>sleep</code>	Make the Command Interface pause for a specified duration
<code>transform</code>	Configure the phase 2 transforms allowed on this IPSEC tunnel profile
<code>tunnel</code>	Configure tunnel parameters

IP Tunnel Destination Profile Mode

In this mode, you can specify parameters for GRE or DVMRP dynamic tunnels.

From Global Configuration mode, type **gre destination profile** or **dvmrp destination profile** and the destination profile name, and press Enter.

```
host1(config)#gre destination profile global
host1(config-dest-profile)#?
  default  Set a command to its default(s)
  do       Run an exec mode command (alias command run)
  enable   Enable a tunnel parameter
  exit     Exit from the current command mode
  help     Describe the interactive help system
  log      Configure logging settings
  macro    Run a CLI macro
  no       Negate a command or set its default(s)
  profile  Assign a profile
  run      Run an exec mode command (alias command do)
  sleep    Make the Command Interface pause for a specified duration
  tunnel   Configure a tunnel parameter
```

```
host1(config)#dvmrp destination profile global
host1(config-dest-profile)#?
  default  Set a command to its default(s)
  do       Run an exec mode command (alias command run)
  enable   Enable a tunnel parameter
  exit     Exit from the current command mode
  help     Describe the interactive help system
  log      Configure logging settings
  macro    Run a CLI macro
  no       Negate a command or set its default(s)
  profile  Assign a profile
  run      Run an exec mode command (alias command do)
  sleep    Make the Command Interface pause for a specified duration
  tunnel   Configure a tunnel parameter
```

L2 Transport Load-Balancing-Circuit Configuration Mode

In this mode, you can specify a member subinterface for a Martini layer 2 circuit that is associated with a load-balancing group.

From Global Configuration mode, type **mpls l2transport load-balancing-group**, specify a group number and a Martini circuit, and press Enter.

```
host1(config)#mpls l2transport load-balancing-group 100 mpls-relay 10.1.1.1 30
host1(config-l2transport-load-balancing-circuit)#?
default  Set a command to its default(s)
do       Run an exec mode command (alias command run)
exit     Exit from the current command mode
help     Describe the interactive help system
log      Configure logging settings
macro    Run a CLI macro
member   Configure members of a l2transport load-balancing circuit
no       Negate a command or set its default(s)
run      Run an exec mode command (alias command do)
sleep    Make the Command Interface pause for a specified duration
```

L2TP Destination Profile Configuration Mode

In this mode, you can create the destination profile that defines the location of an L2TP Access Concentrator (LAC) and define the attributes used when an L2TP Network Server (LNS) communicates with an LAC. The destination is necessary to enable an LAC to connect to the LNS.

From Global Configuration mode, type **l2tp destination profile**, the *profileName*, an *ipAddress*, and press Enter.

```
host1(config)#l2tp destination profile augusta ip address 123.45.76.16
host1(config-l2tp-dest-profile)#?
default  Set a command to its default(s)
do       Run an exec mode command (alias command run)
exit     Exit from the current command mode
help     Describe the interactive help system
log      Configure logging settings
macro    Run a CLI macro
no       Negate a command or set its default(s)
remote   Configure L2TP remote parameters
run      Run an exec mode command (alias command do)
sleep    Make the Command Interface pause for a specified duration
```

L2TP Destination Profile Host Configuration Mode

In this mode, you can set and modify L2TP host profile attributes, such as the proxy Link Control Protocol (LCP), the local hostname, the local IP address, or the interface profile.

From Global Configuration mode, enter L2TP Destination Profile mode (see above), and type **remote host** and a *hostName*, and press Enter.

```
host1(config-l2tp-dest-profile)#remote host george
host1(config-l2tp-dest-profile-host)#?
default  Set a command to its default(s)
disable  Disable L2TP parameter for remote host
do       Run an exec mode command (alias command run)
enable   Enable L2TP parameter for remote host
```

```

exit      Exit from the current command mode
help      Describe the interactive help system
local     Configure L2TP local parameters for remote host
log       Configure logging settings
macro     Run a CLI macro
no        Negate a command or set its default(s)
profile   Assign a profile for remote host
run       Run an exec mode command (alias command do)
sleep     Make the Command Interface pause for a specified duration
tunnel    Configure L2TP tunnel parameters for remote host

```

L2TP Tunnel Switch Profile Configuration Mode

In this mode, you can create an L2TP tunnel switch profile, which configures the L2TP tunnel switching behavior for the interfaces to which this profile is assigned. Issue the **avp** command from this mode to define the L2TP tunnel switching behavior for a specified L2TP attribute-value pair (AVP) type.

From Global Configuration mode, type the **l2tp switch-profile** command followed by an alphanumeric profile name of up to 64 characters, and press Enter.

```

host1(config)#l2tp switch-profile concord
host1(config-l2tp-tunnel-switch-profile)#?
avp        Configure AVP behavior
default    Set a command to its default(s)
do         Run an exec mode command (alias command run)
exit       Exit from the current command mode
help       Describe the interactive help system
log        Configure logging settings
macro      Run a CLI macro
no         Negate a command or set its default(s)
run        Run an exec mode command (alias command do)
sleep      Make the Command Interface pause for a specified duration

```

Layer 2 Control Configuration Mode

In this mode, you can define session timeout values and access the L2C Neighbor Configuration mode to specify the L2C neighbor.

From Global Configuration mode, type **l2c** and press Enter.

```

host1(config)#l2c
host1(config-l2c)#?
default    Set a command to its default(s)
do         Run an exec mode command (alias command run)
exit       Exit from the current command mode
help       Describe the interactive help system
log        Configure logging settings
macro      Run a CLI macro
neighbor   Configure l2c neighbor parameters
no         Negate a command or set its default(s)
run        Run an exec mode command (alias command do)
session-timeout Configure the l2c time-out attribute
sleep      Make the Command Interface pause for a specified duration

```

Layer 2 Control Neighbor Configuration Mode

In this mode, you can specify a neighbor ID and the maximum number of branches that the neighbor can have.

From Global Configuration mode, type **neighbor** and press Enter.

```
host1(config-l2c)#neighbor
host1(config-l2c-neighbor)#?
default      Set a command to its default(s)
do           Run an exec mode command (alias command run)
exit         Exit from the current command mode
help         Describe the interactive help system
id           Configure neighbor-id associated with neighbor
log          Configure logging settings
macro        Run a CLI macro
max-branches Configure max number of branches for neighbor
no           Negate a command or set its default(s)
run          Run an exec mode command (alias command do)
sleep        Make the Command Interface pause for a specified duration
```

LDP Configuration Mode

In this mode, you can create and configure MPLS Label Distribution Protocol (LDP) profile parameters.

From Global Configuration mode, type **mpls ldp interface profile** and the *profileName*, and press Enter.

```
host1(config)#mpls ldp interface profile shell
host1(config-ldp)#?
default      Set a command to its default(s)
do           Run an exec mode command (alias command run)
exit         Exit from the current command mode
hello        Configure hello parameters
help         Describe the interactive help system
log          Configure logging settings
macro        Run a CLI macro
no           Negate a command or set its default(s)
run          Run an exec mode command (alias command do)
sleep        Make the Command Interface pause for a specified duration
```

Line Configuration Mode

In this mode, you can modify the operation of a virtual terminal (vty) line.

From Global Configuration mode, type the **line vty** command and either the *lineNumber* or the *rangeOfLineNumbers* you want to configure, and press Enter.



NOTE: The factory default is 5 vty lines. However, you can increase the number of vty lines available by typing the start number and end number of the vty line range. Once you execute the **line vty** command, you will have access to line numbers up to the ending line number.

```
host1(config)#line vty 0 29
host1(config-line)#?
access-class      Restrict or permit telnet access based on an access list
data-character-bits Set the number of bits per character used by the display
```

default	Set a command to its default(s)
do	Run an exec mode command (alias command run)
exec-banner	Enable the exec banner
exec-timeout	Set the inactivity timeout
exit	Exit from the current command mode
help	Describe the interactive help system
log	Configure logging settings
login	Require the use of passwords for vty logins
macro	Run a CLI macro
motd-banner	Enable the message of the day banner
no	Negate a command or set its default(s)
password	Configure the password for line access
run	Run an exec mode command (alias command do)
sleep	Make the Command Interface pause for a specified duration
timeout	Specify the login timeout value for the selected line(s)



NOTE: The **privilege** command is available in Line Configuration mode when the user is logged in at privilege level 15. For more information, see *Privileged-Level Access* on page 48 and *CLI Command Privileges* on page 50.

Local IPSec Transport Profile Configuration

In this mode, you can configure preshared IKE keys for IPSec transport profiles.

From the IPSec Transport Profile Configuration mode, type **local ip address** and the *ipAddress*, and press Enter.

```
host1(config-ipsec-transport-profile)#local ip address 10.10.1.1
host1(config-ipsec-transport-profile-local)#?
default          Set a command to its default(s)
do               Run an exec mode command (alias command run)
exit             Exit from the current command mode
help             Describe the interactive help system
log              Configure logging settings
macro            Run a CLI macro
no               Negate a command or set its default(s)
pre-share        Specify pre-shared group key based on local ip address
pre-share-masked A pre-encrypted key, generated by show config rather than
                  interactive
run              Run an exec mode command (alias command do)
sleep            Make the Command Interface pause for a specified duration
```

Local User Configuration Mode

In this mode, you can configure parameters for user entries in local user databases.

From the Global Configuration mode, type either **aaa local username** and the *userName* and *databaseName* or **aaa local database** and the *databaseName*. Then press Enter.

```
host1(config)#aaa local username curt38 database westLocal12
host1(config-local-user)#?
default          Set a command to its default(s)
do               Run an exec mode command (alias command run)
exit             Exit from the current command mode
help             Describe the interactive help system
ip-address        Specify an IP address for the user
ip-address-pool   Specify an IP address pool for the user
```

log	Configure logging settings
macro	Run a CLI macro
no	Negate a command or set its default(s)
operational-virtual-router	Specify an operational virtual router for the user
password	Configure the password
run	Run an exec mode command (alias command do)
secret	Configure the secret
sleep	Make the Command Interface pause for a specified duration
support	Enter Support mode

Map Class Configuration Mode

In this mode, you can specify Frame Relay End-to-End fragmentation and reassembly for a map class. Optionally, you can specify the maximum payload size of a fragment or specify fragmentation only or reassembly only.

From Global Configuration mode, type the **map-class frame-relay** command and the *mapClassName* you want to configure, and press Enter.

```
host1(config)#map-class frame-relay testmapclass
host1(config-map-class)#?
default      Set a command to its default(s)
do           Run an exec mode command (alias command run)
exit         Exit from the current command mode
frame-relay  Configure frame relay parameters
help         Describe the interactive help system
log          Configure logging settings
macro        Run a CLI macro
no           Negate a command or set its default(s)
run          Run an exec mode command (alias command do)
sleep        Make the Command Interface pause for a specified duration
```

Map List Configuration Mode

In this mode, you can configure map list parameters. In Map List Configuration mode, commands such as **map-list** and **ip atm-vc** are used to configure ATM NBMA interfaces.

From Global Configuration mode, type **map-list** and a *mapListName*, and press Enter.

```
host1(config)#map-list mjt3330
host1(config-map-list)#?
default      Set a command to its default(s)
do           Run an exec mode command (alias command run)
exit         Exit from the current command mode
help         Describe the interactive help system
ip           Add IP address to the map
log          Configure logging settings
macro        Run a CLI macro
no           Negate a command or set its default(s)
run          Run an exec mode command (alias command do)
sleep        Make the Command Interface pause for a specified duration
```

Parent Group Configuration Mode

In this mode, you can configure a parent group in a hierarchy.

From Global Configuration mode, type the **parent-group** command and specify a *parentGroupName*, and press Enter.

```
host1(config)#parent-group group1
host1(config-parent-group)#?
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  exit         Exit from the current command mode
  help        Describe the interactive help system
  log         Configure logging settings
  macro       Run a CLI macro
  next-parent  Specify the next parent group to call in hierarchy
  no          Negate a command or set its default(s)
  rate-limit-profile Specify a hierarchical rate limit profile
  run         Run an exec mode command (alias command do)
  sleep       Make the Command Interface pause for a specified
```

Policy List Configuration Mode

In this mode, you can configure a policy list—that is, a set of rules—that you can attach to an interface. You can modify a policy list and update it wherever the policy list is used in the configuration.

To create a policy list, from Global Configuration mode type **policy-list** command preceded by the type of policy and press Enter. For example,

```
host1(config)#l2tp policy-list routeL2tp100
```



NOTE: If you do not include the type of policy, the system creates an IP policy list.

```
host1(config)#ip policy-list routeForABBCorp
host1(config-policy-list)#?
  classifier-group Specify the classifier list
  color           Create a color policy
  default        Set a command to its default(s)
  do             Run an exec mode command
  exit          Exit from the current command mode
  filter        Create a filter policy
  forward       Create a forward policy
  help         Describe the interactive help system
  log          Configure logging settings
  macro        Run a CLI macro
  mark         Create a set TOS byte policy
  next-hop     Create a next-hop policy
  next-interface Create a next-interface policy
  no           Negate a command or set its default(s)
  rate-limit-profile Create a rate-limit policy
  run         Run an exec mode command (alias command do)
  sleep       Make the Command Interface pause for a specified
              duration
  suspend     Suspend a policy rule
  traffic-class Create a traffic class policy
  traffic-shape-profile Create a traffic-shape policy
  user-packet-class Create a user packet class policy
```


Policy List Parent Group Configuration Mode

In this mode, you can configure a parent group in a hierarchy.

From Policy List Configuration Mode, type the **parent-group** command and specify a *parentGroupName*, and press Enter.

```
host1(config)#policy-list grouppoll
host1(config-policy-list)#parent-group group1
host1(config-policy-list-parent-group)#?
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  exit         Exit from the current command mode
  help        Describe the interactive help system
  log         Configure logging settings
  macro       Run a CLI macro
  no          Negate a command or set its default(s)
  rate-limit-profile Specify the hierarchical rate limit profile
  run         Run an exec mode command (alias command do)
  sleep       Make the Command Interface pause for a specified
```

Policy Parameter Configuration Mode

In this mode, you can configure a policy parameter.

From Global Configuration mode, type the **policy-parameter** command and specify a *policyParameterType*, the **hierarchical** keyword, and press Enter.

```
host1(config)#policy-parameter param1 hierarchical
host1(config-policy-parameter)#?
  aggregation-node Configure the aggregation node value
  default          Set a command to its default(s)
  do              Run an exec mode command (alias command run)
  exit            Exit from the current command mode
  help           Describe the interactive help system
  log            Configure logging settings
  macro          Run a CLI macro
  no             Negate a command or set its default(s)
  run            Run an exec mode command (alias command do)
  sleep          Make the Command Interface pause for a specified time
```

PPPoE Service Name Table Configuration Mode

In this mode, you can configure entries for a PPPoE service name table. PPPoE clients use these entries to request that an access concentrator (AC), such as an E-series router, support certain services. Issue the **service** command from this mode to configure a specific service name entry, or to specify that the AC should ignore (drop), rather than respond to (terminate, the default action), a PPPoE Active Discovery Initiation (PADI) request from a client containing the empty service name tag.

From Global Configuration mode, type the **pppoe-service-name-table** command followed by an alphanumeric table name of up to 32 characters, and press Enter.

```
host1(config)#pppoe-service-name-table serviceTable1
host1(config-pppoe-service-name-table)#?
  default Set a command to its default(s)
  do      Run an exec mode command (alias command run)
  exit    Exit from the current command mode
```

```

help      Describe the interactive help system
log       Configure logging settings
macro     Run a CLI macro
no        Negate a command or set its default(s)
run       Run an exec mode command (alias command do)
service   Configure service-name table entries
sleep     Make the Command Interface pause for a specified duration

```

Profile Configuration Mode

In this mode, you can configure a profile to subsequently configure dynamic IP interfaces.

From Global Configuration mode, type the **profile** command followed by a profile name of up to 80 characters, and press Enter.

```

host1(config)#profile germany78
host1(config-profile)#?
default   Set a command to its default(s)
do        Run an exec mode command (alias command run)
exit      Exit from the current command mode
help      Describe the interactive help system
ip        Configure IP characteristics
l2tp      Configure L2TP characteristics
log       Configure logging settings
macro     Run a CLI macro
no        Negate a command or set its default(s)
ppp       Configure PPP parameters
pppoe     Pppoe information
run       Run an exec mode command (alias command do)
sleep     Make the Command Interface pause for a specified duration

```

QoS Parameter Definition Configuration Mode

In this mode, you can configure QoS parameter definitions.

From Global Configuration mode, type the **qos-parameter-define** command followed by a *QoSParameterDefinitionName*, and press Enter.

```

host1(config)#qos-parameter-define vpSharedShaper1
host1(config-qos-parameter-define)#?
controlled-interface-type  Configure the valid interface types controlled by
                           this parameter
default                   Set a command to its default(s)
do                         Run an exec mode command (alias command run)
exit                      Exit from the current command mode
help                      Describe the interactive help system
instance-interface-type   Configure the interface types upon which
                           parameters can be instantiated
log                       Configure logging settings
macro                     Run a CLI macro
no                         Negate a command or set its default(s)
range                     Set the valid range of a QoS parameter
run                       Run an exec mode command (alias command do)
sleep                     Make the Command Interface pause for a specified
                           duration
subscriber-interface-type  Configure interface types representing subscriber
                           interfaces

```

QoS Profile Configuration Mode

In this mode, you can specify queue profiles and scheduler profiles in combination with interface types.

From Global Configuration mode, type the **qos-profile** command followed by a *QosProfileName*, and press Enter.

```
host1(config)#qos-profile testabc
host1(config-qos-profile)#?
atm          ATM interface
  atm-vc     ATM-VC interface
  bridge     Bridge interface
  default    Set a command to its default(s)
  do         Run an exec mode command (alias command run)
  ethernet   Ethernet interface
  exit       Exit from the current command mode
  fr-vc      Frame Relay subinterface
  help       Describe the interactive help system
  ip         IP interface
  ip-tunnel  IP FROM-tunnel interface
  l2tp-tunnel L2tp FROM-tunnel interface
  log        Configure logging settings
  lsp        Lsp (MPLS) interface
  macro      Run a CLI macro
  no         Negate a command or set its default(s)
  run        Run an exec mode command (alias command do)
  serial     Serial interface
  server-port Server Port interface
  sleep      Make the Command Interface pause for a specified duration
  svlan      Stacked VLAN subinterface
  vlan       VLAN subinterface
```

QoS Shared Shaper Control Configuration

In this mode, you can configure variables within the simple shared shaper algorithm to control the minimum dynamic rate for all simple shared shapers on the router.

From Global Configuration mode, type the **qos-shared-shaper-control** command and press Enter.

```
host1(config)#qos-shared-shaper-control
host1(config-qos-shared-shaper-control)#?
convergence-factor    Configure how quickly the simple shared shaper
                      converges to a calculated rate
default              Set a command to its default(s)
do                  Run an exec mode command (alias command run)
exit                Exit from the current command mode
help                Describe the interactive help system
log                 Configure logging settings
macro               Run a CLI macro
maximum-voql        Configure the simple shared shaper's maximum
                      virtual output queue length
minimum-dynamic-rate-percent
                      Configure the minimum dynamic rate for a simple
                      shared shaper as a percentage of the
                      shared-shaping-rate
no                  Negate a command or set its default(s)
reaction-factor      Configure how the simple shared shaper reacts
                      to changes in measured rate
```

run	Run an exec mode command (alias command do)
sleep	Make the Command Interface pause for a specified duration

Queue Profile Configuration Mode

In this mode, you can configure queue profiles and various queue profile parameters, such as constraints on queue lengths or queue buffer weights.

From Global Configuration mode, type the **queue-profile** command followed by a *queueProfileName*, and press Enter.

```

host1(config)#queue-profile testabcd1234
host1(config-queue)#?
  buffer-weight      Set drop threshold in proportion to this weight
  committed-length   Set min and max constraints for committed threshold
  conformed-fraction Set conformed threshold as a percentage of committed
  conformed-length   Set min and max constraints for conformed threshold
  default            Set a command to its default(s)
  do                 Run an exec mode command (alias command run)
  exceeded-fraction  Set exceeded threshold as a percentage of committed
  exceeded-length    Set min and max constraints for exceeded threshold
  exit               Exit from the current command mode
  help               Describe the interactive help system
  log                Configure logging settings
  macro              Run a CLI macro
  no                 Negate a command or set its default(s)
  run                Run an exec mode command (alias command do)
  sleep              Make the Command Interface pause for a specified duration

```

RADIUS Configuration Mode

In this mode, you can configure various parameters of your RADIUS authentication, accounting, and dynamic-request servers.

From Global Configuration mode, type either the **radius authentication server**, **radius accounting server**, or **radius dynamic-request server** command with the server *ipAddress*, and press Enter.

```

host1(config)#radius authentication server 1.2.1.3
host1(config-radius)#?
  deadtime      Configure the amount of time a timed-out server is dropped for usage
  default       Set a command to its default(s)
  do            Run an exec mode command (alias command run)
  exit          Exit from the current command mode
  help          Describe the interactive help system
  key           Configure the secret used in RADIUS client to server exchange
  log           Configure logging settings
  macro         Run a CLI macro
  max-sessions  Configure the number of outstanding requests allowed to the server
  no            Negate a command or set its default(s)
  retransmit    Configure the number of times to retransmit RADIUS request
                before failing
  run           Run an exec mode command (alias command do)
  sleep         Make the Command Interface pause for a specified duration
  timeout       Configure the number of seconds to wait for a RADIUS response
                before retransmitting
  udp-port      Configure the RADIUS server's UDP port

```

RADIUS Relay Configuration Mode

In this mode, you can configure various parameters of your RADIUS relay authentication and accounting servers.

From Global Configuration mode, type either the **radius relay authentication server** or **radius relay accounting server** command, and press Enter.

```
host1(config)#radius authentication server
host1(config-radius-relay)#?
  default  Set a command to its default(s)
  do       Run an exec mode command (alias command run)
  exit     Exit from the current command mode
  help     Describe the interactive help system
  key      Configure the secret used in RADIUS client to relay server exchange
  log      Configure logging settings
  macro    Run a CLI macro
  no       Negate a command or set its default(s)
  run      Run an exec mode command (alias command do)
  sleep    Make the Command Interface pause for a specified duration
  udp-port Configure the RADIUS relay server's udp port
```

Rate Limit Profile Configuration Mode

In this mode, you can set parameters for an IP or L2TP rate-limit profile, which is a set of bandwidth attributes and associated actions that become part of a policy list. The policy list is then applied to the ingress or egress of an interface.

To create a hierarchical rate-limit-profile for an IP interface, from Global Configuration mode type **rate-limit-profile** and a *profileName*, and add the keyword **hierarchical**, and press Enter.

To create an IP rate-limit profile, from Global Configuration mode type **ip rate-limit-profile** and a *profileName*, and press Enter.

To create an L2TP rate limit profile, from Global Configuration mode type **l2tp rate-limit-profile** and a *profileName*, and press Enter.



NOTE: If you do not include either the **ip** or **l2tp** keywords, the system creates an IP rate limit profile.

```
host1(config)#ip rate-limit-profile fm78930
host1(config-rate-limit-profile)#?
  committed-action  Set the committed access rate action
  committed-burst   Set the committed access rate burst size in Bytes
  committed-rate    Set the committed access rate value in bits per second
  conformed-action  Set the conformed access rate action
  default           Set a command to its default(s)
  do                Run an exec mode command (alias command run)
  exceeded-action   Set the exceeded action
  exit              Exit from the current command mode
  help              Describe the interactive help system
  log               Configure logging settings
  macro             Run a CLI macro
  mask-val          Set mask to be applied with mark values
  no                Negate a command or set its default(s)
  peak-burst        Set the peak burst size in Bytes
  peak-rate         Set the peak access rate in bits per second
```

<code>run</code>	Run an exec mode command (alias command <code>do</code>)
<code>sleep</code>	Make the Command Interface pause for a specified duration

Redundancy Configuration Mode

In this mode, you can activate high availability (SRP switchover) by issuing the mode **high-availability** command.

From Global Configuration mode, type the **redundancy** command and press Enter.

```
host1(config-router)#redundancy
host1(config-redundancy)#?
  default  Set a command to its default(s)
  do       Run an exec mode command (alias command run)
  exit     Exit from the current command mode
  help     Describe the interactive help system
  log      Configure logging settings
  macro    Run a CLI macro
  mode     Configure redundancy mode
  no       Negate a command or set its default(s)
  run      Run an exec mode command (alias command do)
  sleep    Make the Command Interface pause for a specified duration
```

Remote Neighbor Configuration Mode

In this mode, you can configure remote neighbor parameters for Routing Information Protocol (RIP), Protocol Independent Multicast (PIM), and Open Shortest Path First (OSPF).

From Global Configuration mode, type either **router rip**, **router pim**, or **router ospf** and the *processID*. Press Enter. You are now in Router Configuration mode.

From Router Configuration mode, type the **remote-neighbor** command and the appropriate attributes, and press Enter.

```
host1(config-router)#remote-neighbor 10.13.5.61
host1(config-router-rn)#?
  authentication  Configure authentication
  default         Set a command to its default(s)
  distribute-list Specify an access list to be a distribute list
  do              Run an exec mode command (alias command run)
  exit            Exit from the current command mode
  exit-remote-neighbor Exit the remote-neighbor configuration mode
  help           Describe the interactive help system
  log            Configure logging settings
  macro          Run a CLI macro
  no             Negate a command or set its default(s)
  receive        Set reception characteristics
  route-map      Specify a route map to apply to outgoing routes
  run            Run an exec mode command (alias command do)
  send           Set transmit characteristics
  sleep          Make the Command Interface pause for a specified
                  duration
  split-horizon  Enable Split-horizon
  time-to-live   Configure ttl used to send to this neighbor
  update-source  Source address to be used for transmit
```

Route Map Configuration Mode

In this mode, you can create and modify route maps.

From Global Configuration mode, type the **route-map** command and the appropriate *routeMapNumber*, and press Enter.

```
host1(config)#route-map unis889
host1(config-route-map)#?
default      Set a command to its default(s)
do           Run an exec mode command (alias command run)
exit         Exit from the current command mode
help         Describe the interactive help system
log          Configure logging settings
macro        Run a CLI macro
match        Identify this entry as requiring an attribute match
match-set    Identify this entry to match and set attributes
no           Negate a command or set its default(s)
run          Run an exec mode command (alias command do)
set          Configure this entry to set attributes
sleep        Make the Command Interface pause for a specified duration
```

Router Configuration Mode

In this mode, you can configure a routing protocol using **router** commands.

From Global Configuration mode, type the **router** command and the appropriate router attributes, and press Enter.

```
host1(config)#router bgp 2378
host1(config-router)#?
address-family      Enter address family configuration mode
aggregate-address   Create an aggregate entry in BGP routing table
auto-summary        Automatic summarization of redistributed routes
                    to their natural network masks
bgp                 Configure BGP
default             Set a command to its default(s)
default-fields       Set default fields for show commands
default-information Configure the distribution of default routing
                    information
disable-dynamic-redistribute disable dynamic importing of routing
                    information with the latest policy
distance            Configure administrative distances for routes
do                 Run an exec mode command (alias command run)
exit               Exit from the current command mode
help               Describe the interactive help system
ip                 Configure the type of route to be contributed
                    by this BGP address family
limits              Configure limits on internal BGP tables
log                 Configure logging settings
macro              Run a CLI macro
maximum-paths        Configure the maximum number of equal-cost paths
neighbor            Specify neighbor properties
network             Identify a network for BGP to announce
no                 Negate a command or set its defaults
overload            Configure BGP behaviour when reaching overload
                    state (no more resources available)
redistribute         Configure the redistribution of routing
                    information from another protocol
rib-out             Configure rib-out storage for all BGP peers
run                 Run an exec mode command (alias command do)
```

sleep	Make the Command Interface pause for a specified duration
synchronization	Enable synchronization with the IGP
table-map	Specify a table map to map external entry attributes into routing table
timers	Configure the keep-alive interval and the hold-time

RSVP Configuration Mode

In this mode, you can create and configure MPLS Resource Reservation Protocol (RSVP) parameters.

From Global Configuration mode, type **mpls rsvp interface profile** and the *profileName*, and press Enter.

```
host1(config)#mpls rsvp interface profile sprint
host1(config-rsvp)#?
cleanup-timeout-factor  Configure the timeout factor
default                Set a command to its default(s)
do                    Run an exec mode command (alias command run)
exit                  Exit from the current command mode
help                  Describe the interactive help system
log                   Configure logging settings
macro                 Run a CLI macro
no                    Negate a command or set its default(s)
refresh-period        Configure refresh period
run                   Run an exec mode command (alias command do)
sleep                 Make the Command Interface pause for a specified
                        duration
```

RTR Configuration Mode

In this mode, you can configure Response Time Reporter (RTR) parameters. The RTR feature allows you to monitor your network's performance and its resources by measuring response times and the availability of your network devices.

From Global Configuration mode, type **rtr** and the *mapNumber*, and press Enter.

```
host1(config)#rtr 784078348
host1(config-rtr)#?
default                Set a command to its default(s)
do                    Run an exec mode command (alias command run)
exit                  Exit from the current command mode
frequency              Specify the frequency interval
help                  Describe the interactive help system
hops-of-statistics-kept Specify the hops capture
log                   Configure logging settings
macro                 Run a CLI macro
max-response-failure   Specify the maximum number of consecutive failures
no                    Negate a command or set its default(s)
operations-per-hop     Specify a number of operations per hop
owner                  Specify the owner of entry
request-data-size      Specify the request payload size
run                   Run an exec mode command (alias command do)
samples-of-history-kept Specify the maximum history samples
sleep                 Make the Command Interface pause for a specified duration
tag                   Specify the user defined tag
timeout               Specify the operation timeout
tos                   Specify a value for the ToS byte
type                  Specify the type of the entry
```


Scheduler Profile Configuration Mode

In this mode, you can configure a scheduler profile. You can then set the shaping rate value, enable the strict-priority scheduling for the scheduler node, or set the weighted-round-robin (WRR) value of the scheduler node or queue.

From Global Configuration mode, type **scheduler-profile** and the *scheduleProfileName* that you want to create or configure, and press Enter.

```
host1(config)#scheduler-profile A990
host1(config-scheduler-profile)#?
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  exit         Exit from the current command mode
  help         Describe the interactive help system
  log          Configure logging settings
  macro        Run a CLI macro
  no           Negate a command or set its default(s)
  run          Run an exec mode command (alias command do)
  shaping-rate Shape the node or queue to the specified rate
  sleep        Make the Command Interface pause for a specified duration
  strict-priority Dequeue strict priority packets ahead of other packets
  weight       Set the relative weight of the node or queue
```

Service Session Profile Configuration Mode

In this mode, you can set and modify Service Manager service session profile attributes, such as time, volume, and statistics.

From Global Configuration mode, type the **service-management service-session-profile** command and the *profileName*, and then press Enter.

```
host1(config)#service-management service-session-profile vodISP1
host1(config-service-session-profile)#?
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  exit         Exit from the current command mode
  help         Describe the interactive help system
  log          Configure logging settings
  macro        Run a CLI macro
  no           Negate a command or set its default(s)
  run          Run an exec mode command (alias command do)
  sleep        Make the Command Interface pause for a specified duration
  statistics    Configure statistics
  time         Configure time
  volume       Configure volume
```

SNMP Event Manager Configuration Mode

In this mode, you can configure certain SNMP triggers for events, what occurs when an event is triggered, resource limits for triggers, and some trap notification options.

From Global Configuration mode, type the **snmp-server management-event** command and then press Enter.

```
host1(config)#snmp-server management-event
host1(config-mgmtevent)#?
  default      Set a command to its default(s)
```

do	Run an exec mode command (alias command run)
event	Specify what happens when an event is triggered
exit	Exit from the current command mode
help	Describe the interactive help system
log	Configure logging settings
macro	Run a CLI macro
no	Negate a command or set its default(s)
resource	Specify the resource limits
run	Run an exec mode command (alias command do)
sleep	Make the Command Interface pause for a specified duration
trigger	Specify the conditions that lead to events

Statistics Profile Configuration Mode

In this mode, you can configure a statistics profile. You can then set the rate period during which statistics are gathered, enable statistics gathering, and enable the counting of drop and forwarding events.

From Global Configuration mode, type **statistics-profile** and the *statisticsProfileName* that you want to create or configure, and press Enter.

```

host1(config)#statistics-profile statpro-1
host1(config-statistics-profile)#?
committed-drop-threshold  Set threshold for logging a committed-drop event
conformed-drop-threshold  Set threshold for logging a conformed-drop event
default                  Set a command to its default(s)
do                       Run an exec mode command (alias command run)
exceeded-drop-threshold  Set threshold for logging an exceeded-drop event
exit                     Exit from the current command mode
forwarding-rate-threshold Set threshold for logging a forwarding-rate event
help                     Describe the interactive help system
log                      Configure logging settings
macro                   Run a CLI macro
no                       Negate a command or set its default(s)
rate-period              Set the time period for calculating queue rates
run                      Run an exec mode command (alias command do)
sleep                    Make the Command Interface pause for a specified
                        duration

```

Subinterface Configuration Mode

In this mode, you can configure one or more virtual interfaces, called *subinterfaces*, on a single physical interface. The system supports this feature with ATM and Frame Relay.

Both ATM and Frame Relay provide permanent virtual circuits (PVCs) that can be grouped under separate subinterfaces configured on a single physical interface. Subinterfaces allow multiple encapsulations for a protocol on a single interface.

From Interface Configuration mode, indicate a subinterface by typing the **interface** command and an *interfaceSpecifier* in *slot/port.subinterface* format, and then press Enter. For example:

```

host1(config-if)#interface atm 3/2.6
host1(config-subif)#

```

Subscriber Policy Configuration Mode

In this mode, you can configure a policy (a set of forwarding and filtering rules) that defines how a subscriber (client) bridge group interface should handle various packet types. After you define the policy, use the **bridge subscriber-policy** command (from Global Configuration mode) to associate the policy with a bridge group interface.

From Global Configuration mode, type the **subscriber-policy** command followed by an alphanumeric policy name of any character length, and press Enter.

```
host1(config)#subscriber-policy client1
host1(config-policy)#?
  arp                Modify arp policy
  broadcast          Modify broadcast policy
  default            Set a command to its default(s)
  do                 Run an exec mode command (alias command run)
  exit              Exit from the current command mode
  help              Describe the interactive help system
  ip                 Modify ip policy
  log               Configure logging settings
  macro             Run a CLI macro
  mpls              Modify mpls policy
  multicast          Modify multicast policy
  no                 Negate a command or set its default(s)
  pppoe             Modify PPPoE policy
  relearn           Modify relearn policy
  run               Run an exec mode command (alias command do)
  sleep             Make the Command Interface pause for a specified
                    duration
  unicast           Modify user-to-user (Unicast) policy
  unknown-destination Modify unknown destination policy
  unknown-protocol  Modify unknown protocol policy
```

Traffic Class Configuration Mode

In this mode, you can create a traffic class and configure the level of service to packets assigned to the traffic class.

From Global Configuration mode, type the **traffic-class** command followed by a *trafficClassName*, and then press Enter.

```
host1(config)#traffic-class test123
host1(config-traffic-class)#?
  default          Set a command to its default(s)
  do               Run an exec mode command (alias command run)
  exit            Exit from the current command mode
  fabric-strict-priority Allow packets in this class to be dequeued out of the
                    fabric ahead of other traffic classes
  help            Describe the interactive help system
  log             Configure logging settings
  macro           Run a CLI macro
  no              Negate a command or set its default(s)
  run             Run an exec mode command (alias command do)
  sleep           Make the Command Interface pause for a specified duration
```

Traffic Class Group Configuration Mode

In this mode, you can create and configure traffic-class groups, which can contain multiple traffic classes.

From Global Configuration mode, type the **traffic-class-group** command and a *trafficClassGroupName*, and press Enter.

```
host1(config)#traffic-class-group trafclasnameabcd
host1(config-traffic-class-group)#?
default      Set a command to its default(s)
do           Run an exec mode command (alias command run)
exit         Exit from the current command mode
help         Describe the interactive help system
log          Configure logging settings
macro        Run a CLI macro
no           Negate a command or set its default(s)
run          Run an exec mode command (alias command do)
sleep        Make the Command Interface pause for a specified duration
traffic-class Set the traffic class belong to this group
```

Tunnel Group Configuration Mode

In this mode, you can define up to 31 tunnels for a tunnel group.

From Global Configuration mode, type **aaa tunnel-group** and the *groupName*, and press Enter.

```
host1(config)#aaa tunnel-group storm
host1(config-tunnel-group)#?
default Set a command to its default(s)
do      Run an exec mode command (alias command run)
exit    Exit from the current command mode
help    Describe the interactive help system
log     Configure logging settings
macro   Run a CLI macro
no      Negate a command or set its default(s)
run     Run an exec mode command (alias command do)
sleep   Make the Command Interface pause for a specified duration
tunnel  Configure tunnel tag
```

Tunnel Group Tunnel Configuration Mode

In this mode, you can configure attributes for a tunnel group tunnel.

From Tunnel Group Configuration mode, type **tunnel** and the tag number (in the range 1–31) for the tunnel, and press Enter.

```
host1(config-tunnel-group)#tunnel 1
host1(config-tunnel-group-tunnel)#?
address      Configure tunnel endpoint address
client-name  Configure the client hostname of the tunnel
default      Set a command to its default(s)
do           Run an exec mode command (alias command run)
exit         Exit from the current command mode
help         Describe the interactive help system
identification Configure tunnel identification
log          Configure logging settings
macro        Run a CLI macro
max-sessions Configure maximum sessions for this tunnel
```

medium	Configure tunnel medium
no	Negate a command or set its default(s)
password	Configure tunnel password
preference	Configure tunnel preference
receive-window	Configure the receive window size for this tunnel
router-name	Configure the virtual-router for the domain name
run	Run an exec mode command (alias command do)
server-name	Configure the remote hostname for the tunnel
sleep	Make the Command Interface pause for a specified duration
source-address	Configure tunnel source address
type	Configure tunnel type

Tunnel Profile Configuration Mode

In this mode, you can create and configure MPLS tunnel profiles.

From Global Configuration mode, type **mpls tunnels profile** and the *profileName*, and press Enter.

```
host1(config)#mpls tunnels profile storm
host1(config-tunnelprofile)#?
default  Set a command to its default(s)
do       Run an exec mode command (alias command run)
exit     Exit from the current command mode
help     Describe the interactive help system
log      Configure logging settings
macro    Run a CLI macro
no       Negate a command or set its default(s)
run      Run an exec mode command (alias command do)
sleep    Make the Command Interface pause for a specified duration
tunnel   Configure tunnel interface parameters
```

Tunnel Server Configuration Mode

In this mode, you can configure (provision) the maximum number of tunnel-service interfaces to be used on a dynamic tunnel-server port.

From Global Configuration mode, type **tunnel-server** and the slot number and port number of the dynamic tunnel-server port, and press Enter.

```
host1(config)#tunnel-server 2/2
host1(config-tunnel-server)#?
default  Set a command to its default(s)
do       Run an exec mode command (alias command run)
exit     Exit from the current command mode
help     Describe the interactive help system
log      Configure logging settings
macro    Run a CLI macro
max-interfaces  Configure maximum number of tunnel-server interfaces for
dynamic server port
no       Negate a command or set its default(s)
run      Run an exec mode command (alias command do)
sleep    Make the Command Interface pause for a specified duration
```

VRF Configuration Mode

In this mode, you can create and configure VRF parameters for BGP/MPLS VPNs.

From Global Configuration mode, type **ip vrf** and the *vrfName*, and press Enter. Confirm the new VRF by pressing Enter.

```
host1(config)#ip vrf yankee
Proceed with new vrf creation? [confirm]
host1(config-vrf)#?
  default      Set a command to its default(s)
  description  Configure VRF specific description
  do           Run an exec mode command (alias command run)
  exit         Exit from the current command mode
  export       Specify VRF export characteristics
  help         Describe the interactive help system
  import       Specify VRF import characteristics
  ip           Configure IP characteristics
  log          Configure logging settings
  macro        Run a CLI macro
  maximum      Specify a maximum limit
  no           Negate a command or set its default(s)
  rd           Specify route distinguisher
  route-target Specify VPN extended community Target
  run          Run an exec mode command (alias command do)
  sleep        Make the Command Interface pause for a specified duration
```

VR Group Configuration Mode

In this mode, you can add up to four virtual routers to the virtual router group. The accounting servers of the virtual routers in the group can receive AAA broadcast accounting records.

From Global Configuration mode, type **aaa accounting vr-group** and the *vrGroupName*, and press Enter.

```
host1(config)#aaa accounting vr-group westVrGroup38
host1(config-vr-group)#?
  aaa          Configure authentication, authorization, and accounting
               characteristics
  default      Set a command to its default(s)
  do           Run an exec mode command (alias command run)
  exit         Exit from the current command mode
  help         Describe the interactive help system
  log          Configure logging settings
  macro        Run a CLI macro
  no           Negate a command or set its default(s)
  run          Run an exec mode command (alias command do)
  sleep        Make the Command Interface pause for a specified duration
  support      Enter Support mode
```