BIG-IP® Advanced Routing™
Integrated Management Interface
Command Reference Guide

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CHAPTER 1 ZebOS Command Line Interface Environment

Network administrators and application developers who install and configure ZebOS® IP routing software should use this Command Line Interface (CLI) reference guide. This guide includes the following information:

- An overview of the ZebOS Command Line Interface
- A complete reference of the Command Line Interface (CLI) commands for Integrated Management Interface (IMI)

Command Line Interface Overview

The ZebOS® Command Line Interface (CLI) is a text-based facility conforming to industry standards. The commands can be used in scripts to automate configuration tasks. Each CLI command is usually associated with a specific function or a common function performing a specific task. The Integrated Management Interface (IMI) Shell, or IMISH, gives users and administrators the ability to issue commands to several daemons using a single TELNET session.

Command Line Interface Help

The ZebOS CLI contains a text-based help facility. Access this help by typing in a full or partial command string then typing a question mark "?". The ZebOS CLI displays the command keywords or parameters along with a short description. For example, at the CLI command prompt, type:

`ZebOS> show ?` (CLI does not display the question mark).

The CLI displays this keyword list with short descriptions for each keyword:

```
ZebOS# show
  access-list                  List IP access lists
  bfd                          Bidirectional Forwarding Detection (BFD)
  bgp                          Border Gateway Protocol (BGP)
  cli                          Show CLI tree of current mode
  clns                         Connectionless-Mode Network Service (CLNS)
  debugging                    Debugging functions (see also 'undebug')
  faults                       Show recorded faults
  history                      Display the session command history
  interface                    Interface status and configuration
  ip                           Internet Protocol (IP)
  ipv6                         Internet Protocol version 6 (IPv6)
  isis                         Intermediate System-Intermediate System
  list                         Show command lists
  mrib                         MRIB
  nsm                          NSM
  privilege                    Show current privilege level
  proc-names                   Show process names
  process                      Process
  route-map                    route-map information
  router-id                    Router ID
  running-config               Current Operating configuration version
```

If the ? is typed in the middle of a keyword, the ZebOS CLI displays help for that keyword only.

`ZebOS> show de?` (CLI does not display the question mark).

```
  debugging  Debugging functions (see also 'undebug')
```

If the ? is typed in the middle of a keyword, but the incomplete keyword matches several other keywords, ZebOS displays help for all matching keywords.

```
ZebOS> show i? (CLI does not display the question mark).
  interface  Interface status and configuration
  ip         IP information
  isis       ISIS information
```

Command Completion

The ZebOS CLI can complete the spelling of a command or a parameter. Begin typing the command or parameter, then press the TAB key. For example, at the CLI command prompt type `sh`:

```
ZebOS> sh
```

Press TAB. The CLI displays:

```
ZebOS> show
```

If the command or parameter partial spelling is ambiguous, the ZebOS CLI displays the choices that match the abbreviation. Type `show i` and press TAB. The CLI displays:

```
ZebOS> show i
interface  ip   isis
ZebOS> show i
```

The CLI displays the `interface` and `ip` keywords. Type n to select `interface` and press TAB. The CLI displays:

```
ZebOS> show in
ZebOS> show interface
```

Type ? and the CLI displays the list of parameters for the `show interface` command.

```
ZebOS> show interface
  IFNAME  Interface name
  |       Output modifiers
  >       Output redirection
  <cr>
```

The CLI displays the only parameter associated with this command, the `IFNAME` parameter.

Note: For more information about output modifiers and output redirection, see the Show Command Tokens section.

Command Abbreviations

The ZebOS CLI accepts abbreviations for commands. For example,

```
sh in eth0
```

is an abbreviation for the `show interface` command.

Command Line Errors

Any unknown spelling variation causes the command line parser to display the error `Unrecognized command` in response to the ?. The parser redisplays the command as last entered. When the user presses the Enter key after typing an invalid command, the parser displays:

```
ZebOS(config)#router ospf here
                           ^
% Invalid input detected at '^' marker.
```

where the ^ points to the first character in error in the command.

If a command is incomplete, it displays the following message:

```
ZebOS> show
% Incomplete command.
```

Some commands are too long for the display line and can wrap in mid-parameter or mid-keyword, as shown below:

```
area 10.10.0.18 virtual-link 10.10.0.19 authent
ication-key 57393
```

Definitions

The following table defines the terms used in this document.

Table 1: Definition of Terms

Term	Description
token	A token is a non-character, non-numeric symbol: {}, {}, (), <>, |, ?, >, ., =
parameter	A parameter is an UPPERCASE term for which the user substitutes input.
keyword	A keyword is a lowercase term that the user types exactly as shown.
line	A line is the user input of any text string, including spaces. No other parameters may be entered after input for this token.
word	A word is the user input of any contiguous text string (excluding spaces).

Typographic Conventions

The following table describes the typographic conventions that are used in this guide.

Table 2: .Typographic Conventions

Convention	Name	Description	Example
`Monospaced font`	Command	Represents command strings entered on a command line and sample source code.	`show ip ospf`
UPPERCASE	Variable parameter	Indicates user input. Enter values according to the description. Each uppercased token expands into one or more other tokens.	`area` **`AREAID`** `range` **`ADDRESS`**
`lowercase`	Keyword parameter	Indicates keywords. Enter values exactly as displayed in the command description.	`show ip ospf`
|	Vertical bar	Limits the choices. Select one from the list. Do not enter the bar as part of the command.	`A.B.C.D`**`|`**`<0-4294967295>`
()	Parentheses	Encloses optional parameters. Select one. Do not enter the parentheses as part of the command.	**`(`**`A.B.C.D|<0-4294967295>`**`)`**
{ }	Braces	Encloses optional parameters. Select none, one or more than one. Do not enter the brace as part of the command.	**`{`**`priority <0-255>| poll-interval <1-65535>`**`}`**
[]	Square brackets	Encloses optional parameters. Select one. Do not enter the bracket as part of the command.	**[**parm2|parm2|parm3**]**

Convention	Name	Description	Example
< >	Angle brackets	Encloses a numeric range, endpoints inclusive. Do not enter the bracket as part of the command.	**<**0-65535**>**
=	Equal sign	Separates the variable from explanatory text. Do not enter the equal sign as part of the command.	PROCESSID **=** <0-65535>
A.B.C.D	IP address	An IPv4-style address	10.0.11.123
X:X::X:X	IP address	An IPv6-style address	3ffe:506::1 where the :: is all the zeros for address components not explicitly given.

Format used for Command Description

The following describes the format used when describing each command in this document.

Table 3: Command Description Formats

Format	Description
Command Name	Describes the command, what the command does and when should it be used.
Command Syntax	Displays the syntax of each command.
Parameters	Defines parameters and options within each command syntax.
Default	Displays the status of the command before it is executed.
Command Mode	Displays the name of the command mode in which this command is used. Examples include Exec or Configure modes.
Example	Displays an example of the command being executed and the complexities of the command syntax.
Related Commands	Lists the commands that are of immediate importance.

Command Negation

Many commands can be negated using the no keyword. Depending on the command or the parameters, some command negation can disable one feature or a feature for a specific ID, interface, address or other identifier.

However, some negation is for the base command only; thus, the negated form does not take a parameter.

Variable Parameter Expansion

For some commands, an IP address or a number in a given range can replace a parameter. For example:

```
area AREAADDRESSID virtual-link ROUTERID (AUTHENTICATE|MSGD|INTERVAL)
AREAADDRESSID=A.B.C.D|<0-4294967295>
```

Therefore, the following is the minimum command for the ROUTERID by an IP address:

```
area 10.10.0.11 virtual-link 10.10.0.12
```

Users can only choose an optional parameter in the string `[AUTHENTICATE|MSGD|INTERVAL]`. In addition, users can replace a parameter by a keyword or parameter. For example, the following string replaces the `MD5` parameter:

```
MD5= [message-digest-key <1-255> md5 MD5_KEY]
```

with `MD5_KEY` replaced by a 1-16 character string.

Show Command Tokens

Users can use two tokens to modify the output of a show command. Enter a question mark to display these tokens:

```
ZebOS# show users ?
  | Output modifiers
  > Output redirection
```

Output Modifiers

Users can type the | (vertical bar character) to use output modifiers. For example:

ZebOS>show rsvp | ?

```
   begin     Begin with the line that matches
   exclude   Exclude lines that match
   include   Include lines that match
   redirect  Redirect output
```

Begin Parameter

The `begin` parameter displays the output beginning with the first line containing a token matching the input string (everything typed after the `begin` token). For example:

```
ZebOS# show run | begin eth1
...skipping
interface eth1
 ipv6 address fe80::204:75ff:fee6:5393/64
!
interface eth2
 ipv6 address fe80::20d:56ff:fe96:725a/64
!
line con 0
 login
!
end
```

Exclude Parameter

The `exclude` parameter excludes all lines of output that contain the input string. In the following output example, all lines containing the word “include” are excluded:

```
ZebOS# show interface eth1 | exclude input
Interface eth1
  Scope: both
  Hardware is Ethernet, address is 0004.75e6.5393
  index 3 metric 1 mtu 1500 <UP,BROADCAST,RUNNING,MULTICAST>
  VRF Binding: Not bound
```

```
  Label switching is disabled
  DSTE Bandwidth Constraint Mode is MAM
  inet6 fe80::204:75ff:fee6:5393/64
    output packets 4438, bytes 394940, dropped 0
    output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0
    collisions 0
```

Include Parameter

The `include` parameter includes only those lines of output that contain the input string. In the output below, all lines containing the word “input” are included:

```
ZebOS# show interface eth1 | include input
    input packets 80434552, bytes 2147483647, dropped 0, multicast packets 0
    input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 1, missed 0
```

Redirect Parameter

The `redirect` parameter puts the lines of output into the indicated file.

```
ZebOS# show history | redirect /var/frame.txt
```

In addition, the output redirection token (>) allows the user to specify a target file for the lines of output.

```
ZebOS# show history >/var/frame.txt
```

Note: To modify the lines displayed for any Show command in this guide, use the | (vertical bar) output modifier token; to save the output to a file, use the > (right arrow) output redirection token.

Command Modes

Commands available for each protocol separate into several modes (or nodes) and are arranged in a hierarchy. Each mode has its own special commands.

Table 4: Command Modes

Name	Description
Exec Mode	Also called the `View` mode, this mode the first mode to appear after logging in to the CLI. It is a base mode from where users can perform basic commands, such as `show`, `exit`, `quit`, `help`, `list`, and `enable`.
Privileged Exec Mode	Also called the `Enable` mode, it allows users to run additional basic commands, such as `debug`, `write` (for saving and viewing the configuration) and `show` commands.
Configure Mode	Also called `Configure Terminal` mode, it allows users to run configuration commands and to serve as a gateway into the `Interface`, `Router`, `Line`, `Route Map`, `Key Chain` and `Address Family` modes.
Interface Mode	Is used to configure protocol-specific settings for a particular interface. Any attribute configured in this mode overrides an attribute configured in the `Router` mode.
Line Mode	Is used to make the `access-class` commands available.

Common Command Mode Tree

The diagram displays the common command mode tree.

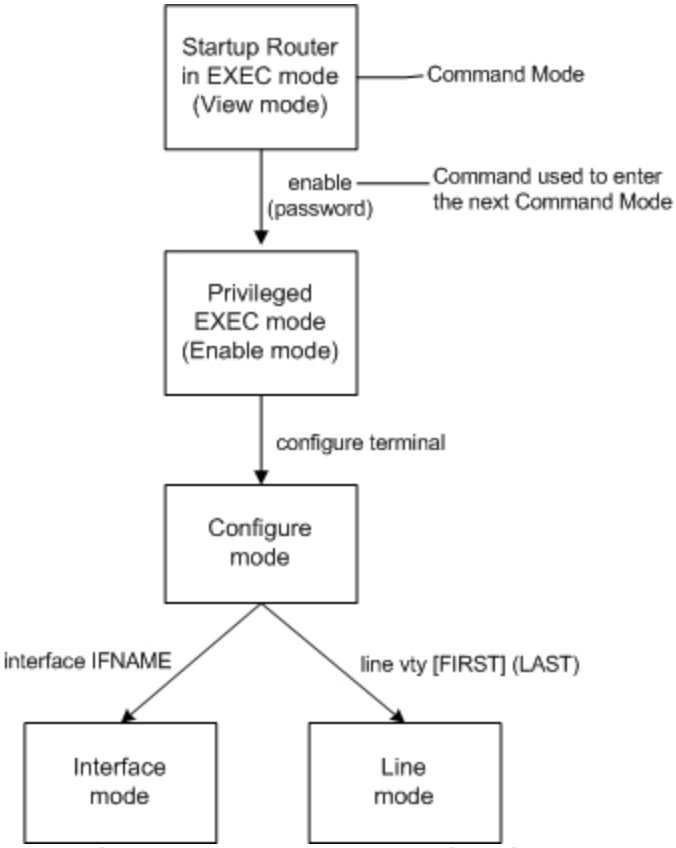

Figure 1: Common Command Mode Tree

CHAPTER 2 Common IMI Commands

This chapter provides a description, syntax, and examples of the common Integration Management Interface (IMI) commands. It includes the following commands:

banner

Use the `banner` command to display the banner motive of the day on login. When using the `banner` command through IMISH, you must write to memory using the `write memory` or `write file` command. If you have not written to memory, the change made by this command (the new banner) is not available when you log into IMISH the next time.

By default, the following banner is displayed on logging.

```
Hello, this is ZebOS(version 4.0051502-Main).
Copyright 2001, 2002 IP Infusion Inc.
```

Use the `no` parameter to disable this function.

Command Syntax

```
banner motd default
no banner motd
```

Parameters

`motd`	Sets the message of the day banner
`LINE`	Specify a custom string.
`default`	Specify a default string.

Command Mode

Configure mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#banner motd default

ZebOS#configure terminal
ZebOS(config)#no banner motd
```

configure terminal

Use the `configure terminal` command to enter the `Configure` command mode.

Command Syntax

```
configure terminal
```

Parameters

None

Command Mode

Privileged Exec mode

Example

The following example shows the use of the `configure terminal` command to enter the `Configure` command mode (note the change in the command prompt).

```
ZebOS#configure terminal
ZebOS(config)#
```

copy running-config startup-config

Use the `copy running-config startup-config` to write configurations to the file to be used at startup. This is the same as the `write memory` command.

Command Syntax

```
copy running-config startup-config
```

Parameters

None

Command Mode

Privileged Exec mode

Example

```
ZebOS#copy running-config startup-config
Building configuration...
[OK]
ZebOS#
```

disable

Use this command from to exit the Privileged Exec mode and return to the Exec mode. This is the only command that allows a user to go back to the Exec mode. Using the `exit` or `quit` command from the Privileged Exec mode ends the session; they do not go back to the Exec mode.

Command Syntax

```
disable
```

Parameters

None

Command Mode

Privileged Exec mode

Example

```
ZebOS#disable
ZebOS>
```

enable

Use the `enable` command to enter the Privileged Exec command mode.

Command Syntax

```
enable
```

Parameters

None

Command Mode

Exec mode

Example

The following example shows the use of the `enable` command to enter the Privileged Exec mode (note the change in the command prompt).

```
ZebOS>enable
ZebOS#
```

end

Use the `end` command to return to the Privileged Exec command mode from any other advanced command mode.

Command Syntax

```
end
```

Parameters

None

Command Mode

All command modes

Example

The following example shows the use of the `end` command to return to the Privileged Exec mode directly from Interface mode.

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#end
ZebOS#
```

exec-timeout

Use this command to set the interval the command interpreter waits for user input detected. That is, this sets the time a telnet session waits for an idle VTY session before it times out. A value of zero minutes and zero seconds (0 and 0) causes the telnet session to wait indefinitely.

Use the no parameter to disable the wait interval.

Command Syntax

```
exec-timeout <0-35791> (<0-2147483>|)
no exec-timeout (<0-35791>|) (<0-2147483>|)
```

Parameters

<0-35791>	Indicate the timeout value in minutes.
<0-2147483>	Indicate the timeout value in seconds.

Command Mode

Line mode

Example

In the following example, the telnet session will timeout after 2 minutes, 30 seconds if there is no response from the user.

```
Router#configure terminal
Router(config)#line vty 23 66
Router(config-line)#exec-timeout 2 30
```

history

Use this command to set the maximum number of commands that are stored in the command history

Use the no parameter to remove the set configuration.

Command Syntax

```
history max <0-2147483647>
no history max
```

Parameters

max	Specify the maximum value.
<0-2147483647>	Specify the number of commands.

Command Mode

Line mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#line vty 12 77
ZebOS(config-line)#history max 123

ZebOS(config-line)#no history max
```

line console

Use the `line console` command to move or change to the line console mode.

Use the no parameter to disable this command.

Command Syntax

```
line console <0-0>
```

Parameters

`<0-0>`	Specify the first line number.

Command Mode

Configure mode

Example

The following example shows the use of the `line` command to enter the Line command mode (note the change in the prompt).

```
ZebOS#configure terminal
ZebOS(config)#line console 0
ZebOS(config-line)#
```

line vty

Use the `line vty` command to move or change to VTY mode. This command is used to connect to NSM or a protocol daemons. This configuration is necessary for any session. This configuration should be in the daemon's config file before starting the daemon.

Use the `no` parameter to disable this command.

Command Syntax

```
line vty <0-871> (<0-871>|)
no line vty <0-871> (<0-871>|)
```

Parameters

`<0-871>`	Specify the first line number.
`<0-871>`	Specify the last line number.

Command Mode

Configure mode

Example

The following example shows the use of the `line` command to enter the Line command mode (note the change in the prompt).

```
ZebOS#configure terminal
ZebOS(config)#line vty 9
ZebOS(config-line)#
```

service advanced-vty

Use this command to set multiple options to be listed when the Tab key is pressed after completing a command. This feature applies to commands with more than one option.

Use the no parameter to set no options to be listed when the Tab key is pressed, after completing a command.

Command Syntax

```
service advanced-vty
no service advanced-vty
```

Parameters

None

Command Mode

Configure mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#service advanced-vty
```

show process

Use this command to display information of ZebOS protocol daemon processes.

Command Syntax

```
show process
```

Parameters

None

Command Mode

Exec modes

Example

This is a sample show output of the show process command displaying information of a currently running process.

```
ZebOS#show process
 PID NAME             TIME    FD
   1 nsm          00:56:29    7
   2 ripd         00:56:29    11
   3 ripngd       00:56:29    12
   4 ospfd        00:56:29    9
   5 ospf6d       00:56:29    10
   6 bgpd         00:56:29    14
   9 isisd        00:56:29    8
ZebOS#
```

show running-config

Use this command to show the running system status and configuration.

Command Syntax

```
show running-config
show running-config full
```

Parameters

`full`	Display the full configuration information.

Command Mode

Privileged Exec mode and Config Mode

Example

```
ZebOS(config)#show running-config
no service password-encryption
!
no service dhcp
ip domain-lookup
!
mpls propagate-ttl
!
vrrp vmac enable
spanning-tree mode provider-rstp
no data-center-bridging enable
!
interface lo
 ip address 127.0.0.1/8
 ipv6 address ::1/128
 no shutdown
!
interface eth0
 ip address 10.1.2.173/24
 no shutdown
!
interface eth1
 shutdown

!
line con 0
 login
!
end
ZebOS(config)#
```

show running-config access-list

Use this command to show the running system status and configuration details for access-list.

Command Syntax

```
show running-config access-list
```

Parameters

None

Command Mode

Privileged Exec mode, Configure mode, Router-map mode

Example

```
ZebOS(config)#show running-config access-list
!
access-list abc remark annai
access-list abc deny any
access-list abd deny any
!
ZebOS#
```

show running-config as-path access-list

Use this command to show the running system status and configuration details for as-path access-list.

Command Syntax

```
show running-config as-path access-list
```

Parameters

None

Command Mode

Privileged Exec mode, Configure mode, Router-map mode

Example

```
ZebOS(config)#show running-config as-path access-list
!
ip as-path access-list wer permit knsmk
!
ZebOS(config)#
```

show running-config community-list

Use this command to show the running system status and configuration details for community-list.

Command Syntax

```
show running-config community-list
```

Parameters

None

Command Mode

Privileged Exec mode

Example

```
ZebOS>enable
ZebOS(config)#show running-config community-list
!
ip community-list standard aspd permit internet
ip community-list expanded cspd deny ljj
ip community-list expanded cspd permit dcv
ip community-list expanded wde permit njhd
ip community-list expanded wer deny sde
ZebOS(config)#
```

show running-config interface igmp

Use this command to show the running system status and configuration for an IGMP IP interface.

Command Syntax

```
show running-config interface IFNAME ip igmp
```

Parameters

IFNAME	Display the interface name.
ip	Display the internet protocol (IP).

Command Mode

Privileged Exec mode and Configure mode

Example

```
ZebOS#show running-config interface ip igmp
!
interface eth1
!
ZebOS(config)#
```

show running-config interface multicast

Use this command to show the running system status and configuration for an multicast interface.

Command Syntax

```
show running-config interface IFNAME ip multicast
```

Parameters

IFNAME	Display the interface name.
ip	Display the internet protocol (IP).

Command Mode

Privileged Exec mode and Configure mode

Example

```
ZebOS#show running-config interface eth1 ip multicast
!
interface eth1
!
ZebOS(config)#
```

show running-config prefix-list

Use this command to show the running system status and configuration details for prefix-list.

Command Syntax

```
show running-config prefix-list
```

Parameters

None

Command Mode

Privileged Exec mode

Example

```
ZebOS>enable
ZebOS#show running-config prefix-list
!
ip prefix-list abc seq 5 permit any
ip prefix-list as description annai
ip prefix-list wer seq 45 permit any
!
```

show users

Use this command to display information about users logged on to a terminal.

Command Syntax

```
show users
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

This is a sample output of the `show users` command:

```
ZebOS#show users

Line       User       Host(s)              Idle       Location
130 vty 0             idle                 00:45:44   2
```

terminal length

Use the terminal length command to display the number of lines on a screen. Enter a value between 0 and 512 lines. Enter zero for no pausing.

Use the no option to unset the number of lines on a screen.

Command Syntax

```
terminal length <0-512>
terminal no length <0-512>
```

Parameters

<0-512>	Enter the number of lines on screen (0 for no pausing)

Command Mode

Exec mode and Privileged Exec mode

Examples

```
ZebOS>enable
ZebOS#terminal length 0
```

terminal monitor

Use the terminal monitor command to display debugging output on a terminal. Use one of the optional parameters to enable the display of debugging output for the Privileged Virtual Router (PVR) or VR user. When the command is used without either of the optional parameters, it may be used by a PVR user or non-PVR user to display the debug output on the terminal for the user local VR. When used with either parameter, it may be used only by a PVR user.

The no form of the command terminates the debug output on the terminal. Both the PVR and VR user can use this command. In addition, the PVR user can cancel a debug output from a specific VR or all VRs.

Command Syntax

```
terminal monitor
terminal monitor (all|WORD|)
terminal no monitor
terminal no monitor (WORD|)
```

Parameters

`WORD`	Used in the PVR context, and contains the VR name to be included in the debugging session.
`all`	Used the PVR context to include all VR in a PVR debugging session.

Command Mode

Privileged Exec mode

Example

```
ZebOS>Enable
ZebOS#terminal monitor
```

username

Use the username command to establish a user name authentication.

The no form of the command to delete a user name authentication.

Command Syntax

```
username WORD
username WORD password (8|) LINE
username WORD privilege <0-15>
username WORD privilege <0-15> password (8|) LINE
no username WORD
```

Parameters

WORD	Specify the user name.
privilege	Indicate the privilege parameter.
<0-15>	Specify the actual privilege level.
password	Indicate the password parameter.
8	Specify that hidden password will follow.
LINE	Specify the hidden enable password string.

Note: Password can be an alpha-numeric string up to 80-characters, including spaces. The string cannot begin with a number.

Command Mode

Configure mode

Example

```
ZebOS#configure terminal
ZebOS(config)#username password password new 12345
```

CHAPTER 3 IMI Shell Commands

This chapter provides a description, syntax, and examples of the IMI Shell commands. It includes the following commands:

do

Use this command to run any Exec mode or Privileged Exec mode command from the Configure mode.

Command Syntax

```
do LINE
```

Parameters

LINE	Specify the command and its parameters.

Command Mode

Configure mode

Example

```
ZebOS#configure terminal
ZebOS#(config)#do show interface
Interface lo
  Hardware is Loopback index 1 metric 1 mtu 16436 duplex-half arp ageing
timeout 25
  <UP,LOOPBACK,RUNNING>
  VRF Binding: Not bound
  Label switching is disabled
  No Virtual Circuit configured
  Administrative Group(s): None
  DSTE Bandwidth Constraint Mode is MAM
  inet 4.4.4.40/32 secondary
  inet 127.0.0.1/8
  inet6 ::1/128
  Interface Gifindex: 3
  Number of Data Links: 0
  GMPLS Switching Capability Type:
    Packet-Switch Capable-1 (PSC-1)
  GMPLS Encoding Type: Packet
  Minimum LSP Bandwidth 0
    input packets 10026, bytes 730660, dropped 0, multicast packets 0
    input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 0, missed 0
    output packets 10026, bytes 730660, dropped 0
    output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0
    collisions 0
ZebOS#
```

login

Use this command to set a password prompt before entering the configuration mode, and enable password checking.

Use the `no login` command allows users to connect directly to the Privileged Exec mode skipping the password verification prompt. After using the `no login` command, if the user changes to the `login` command again, the system uses the password used earlier, unless the user specifies a password in the configure mode.

Note: Password can be an alpha-numeric string up to 80-characters, including spaces. The string cannot begin with a number.

Command Syntax

```
login local
no login local
```

Parameters

`local`	Local password checking

Default

Enabled

Command Mode

Line mode

Examples

The following examples show the use of `login` and `no login` command. In this example, a password `pass` is set (in configure mode) before using the `login` command.

```
ZebOS#configure terminal
ZebOS(config)#line vty 1
ZebOS(config-line)#no login

ZebOS#configure terminal
ZebOS#(config)#password pass
ZebOS#(config)#line vty 1
ZebOS#(config-line)#login local
```

logout

Use this command to exit from the ZebOS CLI.

Command Syntax

```
logout
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS>logout
[root@TSUP40 sbin]#
```

mstat

Use this command to display IP multicast packet rate and loss information. This command is identical in function to the UNIX version of mtrace that reports packet rate and loss information.

If no arguments are entered, the router will interactively prompt you for them.

Command Syntax

```
mstat
mstat A.B.C.D
mstat A.B.C.D A.B.C.D
mstat A.B.C.D A.B.C.D
mstat A.B.C.D A.B.C.D A.B.C.D (<1-255>|)
```

Parameters

A.B.C.D	Multicast-capable source IP address. This is a unicast address of the beginning of the path to be traced.
A.B.C.D	Unicast destination IP address. If omitted, the mtrace starts from the system at which the command is typed.
A.B.C.D	Multicast address of the group to be traced. The default address is 224.2.0.1 (group used for multicast backbone [MBONE] audio). When address 0.0.0.0 is used, a weak mtrace is invoked. The weak mtrace follows the reverse path forwarding (RPF) path to the source, whether or not any router along the path has the multicast routing table state.
<1-255>	TTL for the multicast trace request. This is the maximum number of hops to be traced on the path from the destination to the source.

Command Mode

Privileged Exec mode

Example

```
ZebOS>enable
ZebOS5#mstat 192.168.1.1 192.168.10.1 1.1.1.1 1
ZebOS5#mstat
Source address: 192.168.1.1
Destination address: 192.168.10.1
Group address: 224.1.1.1
```

ping

Use the `ping` utility to query another host (send echo messages).

Command Syntax

```
ping WORD
ping ip WORD
ping ipv6 WORD (|IFNAME)
ping ipv6 WORD (|IFNAME) (vrf NAME|)
ping WORD (vrf NAME|)
```

Parameters

`WORD`	Specify the destination address or hostname. Use the A.B.C.D form for an IPv4 address. Use the x:x::x:x for an IPv6 address.
`vrf`	Specify the VPN routing/forwarding instance.
`NAME`	Specify the name if the VPN routing/forwarding instance.
`ip`	Specify the IP echo.
`WORD`	Specify the destination address or hostname. Use the A.B.C.D form to specify an IPv4 address.
`ipv6`	Specify the IP echo.
`WORD`	Specify the destination address or hostname. Use the x:x::x:x form to specify an IPv6 address.
`IFNAME`	Specify the name of the interface.
`vrf`	Specify the VPN routing/forwarding instance.
`NAME`	Specify the VPN routing/forwarding instance.

Command Mode

Privileged Exec mode

Examples

```
ZebOS>enable
ZebOS#ping ip 3ffe::4
64 bytes from 10.10.100.126: icmp_seq=25 ttl=127 time=3.67 ms
64 bytes from 10.10.100.126: icmp_seq=26 ttl=127 time=3.67 ms
64 bytes from 10.10.100.126: icmp_seq=27 ttl=127 time=2.34 ms
64 bytes from 10.10.100.126: icmp_seq=28 ttl=127 time=1.66 ms
--- 10.10.100.126 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 49197ms
rtt min/avg/max/mdev = 1.322/3.864/29.762/4.892 ms, pipe 2
ZebOS#
```

privilege level

Use this command to set a new command privilege level.

Use the no parameter with this command to disable the command privilege level.

Command Syntax

```
privilege level <1-15>
privilege level (16)
no privilege level (<1-15>|)
no privilege level (16)
```

Parameters

16	Specify the maximum privilege level for a line.
<1-15>	Specify the default privilege level for a line.

Command Mode

Line mode

Example

```
ZebOS#configure terminal
ZebOS(config)#line vty 0 5
ZebOS(config-line)#privilege level 15
```

show privilege

Use this command to display the current privilege level set in the IMISH. The privilege level varies from 1-15.

Note: Currently, privilege levels 2-14 are undefined.

Command Syntax

```
show privilege
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS#show privilege
Current privilege level is 15
ZebOS#
```

start-shell

Use this command to execute commands on the underlying kernel. For example, after using this command, you can use Linux commands, if Linux is the underlying operating system.

Use the `exit` command to get back to the IMISH.

Command Syntax

```
start-shell
```

Parameters

None

Command Mode

Privileged Exec mode

Example

```
ZebOS#start-shell
[root@TSUP40 sbin]#exit
exit
ZebOS#
```

telnet

Use this command to open a telnet session.

Command Syntax

```
telnet WORD
telnet WORD PORT
```

Parameters

WORD	Specify the IP address or hostname of a remote system.
PORT	Specify the TCP port number.

Command Mode

Privileged Exec mode

Example

```
ZebOS#telnet 2.2.2.2 2602
trying telnet 2.2.2.2 2602...
```

traceroute

Use this command to trace an IPv4 route to its destination.

Command Syntax

```
traceroute WORD
traceroute WORD (vrf NAME|)
traceroute ip WORD
traceroute ipv6 WORD (vrf NAME|)
```

Parameters

WORD	Specify the destination address or hostname. Use the A.B.C.D form for an IPv4 address. Use the x:x::x:x for an IPv6 address.
vrf	Specify the VPN routing/forwarding instance.
NAME	Specify the name if the VPN routing/forwarding instance.
ip	Specify the IP echo.
WORD	Specify the destination address or hostname. Use the A.B.C.D form to specify an IPv4 address.
ipv6	Specify the IP echo.
WORD	Specify the destination address or hostname. Use the x:x::x:x form to specify an IPv6 address.
vrf	Specify the VPN routing/forwarding instance.
NAME	Specify the VPN routing/forwarding instance.

Command Mode

Privileged Exec mode

Example

```
ZebOS#traceroute ip 10.10.100.126
traceroute to 10.10.100.126 (10.10.100.126), 30 hops max, 38 byte packets
 1  10.1.2.1 (10.1.2.1)  0.386 ms  0.315 ms  0.293 ms
 2  10.10.100.126 (10.10.100.126)  1.944 ms  1.497 ms  1.296 ms
ZebOS#
```

write

Use this command to write configuration data to a file.

Command Syntax

```
write file
write memory
```

Parameters

`file`	Specify to write the configuration to a file.
`memory`	Specify to write the configuration write to non-volatile (NV) memory.

Command Mode

Privileged Exec mode

Example

The following is an output from the `write terminal` command displaying current configuration on the terminal.

```
ZebOS#write file
Building configuration...
ZebOS#
```

write terminal

Use the `write terminal` command to display current configurations to the VTY terminal.

Command Syntax

```
write terminal
```

Parameters

None

Command Mode

Privileged Exec mode

Example

The following is an output from the `write terminal` command displaying current configuration on the terminal.

```
ZebOS#write terminal

Current configuration:
!
hostname ripd
password zebra
log stdout
!
debug rip events
debug rip packet
!
interface lo
!
interface eth0
 ip rip send version 1 2
 ip rip receive version 1 2
!
interface eth1
 ip rip send version 1 2
 ip rip receive version 1 2
!
!
router rip
 network 10.10.10.0/24
 network 10.10.11.0/24
 redistribute connected
!
line vty
 exec-timeout 0 0
```

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