ZebOS-XP®
Network Platform

Version 1.4
Extended Performance

Integrated Management Interface
Command Reference

December 2015

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Contents

Preface

This document describes the commands for the Integration Management Interface (IMI) component in ZebOS-XP.

Audience

This document is intended for network administrators and other engineering professionals who configure and manage ZebOS-XP.

Conventions

Table P-1 shows the conventions used in this guide.

Table P-1: Conventions

Convention	Description
Italics	Emphasized terms; titles of books
Note:	Special instructions, suggestions, or warnings
`monospaced type`	Code elements such as commands, functions, parameters, files, and directories

Contents

This document contains these chapters:

- Chapter 1, *Command Line Interface*
- Chapter 2, *Common IMI Commands*
- Chapter 3, *IMI Shell Commands*
- Chapter 4, *VLOG Commands*
- Chapter 5, *System Commands*

Related Documents

The following guides are related to this document:

- *Integration Management Interface Developer Guide*
- *Installation Guide*

Note: All ZebOS-XP technical manuals are available to licensed customers at http://www.ipinfusion.com/support/document_list.

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CHAPTER 1 Command Line Interface

This chapter introduces the ZebOS-XP Command Line Interface (CLI) and how to use its features.

Overview

You use the CLI to configure, monitor, and maintain ZebOS-XP devices. The CLI is text-based and each command is usually associated with a specific task.

You can give the commands described in this manual locally from the console of a device running ZebOS-XP or remotely from a terminal emulator such as `putty` or `xterm`. You can also use the commands in scripts to automate configuration tasks.

Starting the Command Line Interface

You must start daemons as described in this section before you can use the CLI. The general steps are listed below. For details about the ZebOS-XP daemons, see the *Installation Guide.*

1. Start your terminal emulator and connect to the device or go to the console of the device running ZebOS-XP.
2. Connect to the directory where you installed the ZebOS-XP executables.
3. Start the Network Services Module (NSM).
   ```
   # ./nsm -d
   ```
4. Start the protocol module daemons that your organization uses, such as `mstpd`, `ospf6d`, or `ripd`.
   ```
   # ./mstpd -d
   ```
5. Start the Integrated Management Interface (IMI) daemon.
   ```
   # ./imi -d
   ```
6. Start the IMI shell.
   ```
   # ./imish
   ```
   Note: Your organization may use a ZebOS-XP build that does not include `imish`. If that is the case, you must connect to a port on which a protocol daemon is listening. For details, see the *Installation Guide.*

You can now begin using the CLI.

Command Line Interface Help

You access the CLI help by entering a full or partial command string and a question mark “?”. The CLI displays the command keywords or parameters along with a short description. For example, at the CLI command prompt, type:

```
> show ?
```

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

```
show ?
  application-priority            Application Priority
```

```
  arp                             Internet Protocol (IP)
  bfd                             Bidirectional Forwarding Detection (BFD)
  bgp                             Border Gateway Protocol (BGP)
  bi-lsp                          Bi-directional lsp status and configuration
  bridge                          Bridge group commands
  ce-vlan                         COS Preservation for Customer Edge VLAN
  class-map                       Class map entry
  cli                             Show CLI tree of current mode
  clns                            Connectionless-Mode Network Service (CLNS)
  control-adjacency               Control Adjacency status and configuration
  control-channel                 Control Channel status and configuration
  cspf                            CSPF Information
  customer                        Display Customer spanning-tree
  cvlan                           Display CVLAN information
  debugging                       Debugging functions (see also 'undebug')
  dot1x                           IEEE 802.1X Port-Based Access Control
  etherchannel                    LACP etherchannel
  ethernet                        Layer-2
...
```

If you type the ? in the middle of a keyword, the CLI displays help for that keyword only.

```
> show de?
debugging  Debugging functions (see also 'undebug')
```

If you type the ? in the middle of a keyword, but the incomplete keyword matches several other keywords, ZebOS-XP displays help for all matching keywords.

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

Command Completion

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

```
> sh
```

Press the tab key. The CLI displays:

```
> show
```

If the spelling of a command or parameter is ambiguous, the CLI displays the choices that match the abbreviation. Type `show i` and press the tab key. The CLI displays:

```
> show i
  interface  ip         ipv6       isis
> show i
```

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

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

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

```
> show interface
  IFNAME  Interface name
  |       Output modifiers
```

```
>       Output redirection
<cr>
```

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

Command Abbreviations

The CLI accepts abbreviations that uniquely identify a keyword in commands. For example:

```
> sh in eth0
```

is an abbreviation for:

```
> show interface eth0
```

Command Line Errors

Any unknown spelling causes the CLI to display the error `Unrecognized command` in response to the ?. The CLI displays the command again as last entered.

```
> show dd?
% Unrecognized command
> show dd
```

When you press the Enter key after typing an invalid command, the CLI displays:

```
(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, the CLI displays the following message:

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

Some commands are too long for the display line and can wrap mid-parameter or mid-keyword, as shown below. This does *not* cause an error and the command performs as expected:

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

Command Negation

Many commands have a `no` form that resets a feature to its default value or disables the feature. For example:

- The `ip address` command assigns an IPv4 address to an interface
- The `no ip address` command removes an IPv4 address from an interface

Syntax Conventions

Table 1-1 describes the conventions used to represent command syntax in this reference.

Table 1-1: Syntax conventions

Convention	Description	Example
`monospaced font`	Command strings entered on a command line	`show running-config`
`lowercase`	Keywords that you enter exactly as shown in the command syntax.	`show running-config`
`UPPERCASE`	See Variable Placeholders	`IFNAME`
`()`	Optional parameters, from which you must select one. Vertical bars delimit the selections. Do not enter the parentheses or vertical bars as part of the command.	`(A.B.C.D|<0-4294967295>)`
`()`	Optional parameters, from which you select one or none. Vertical bars delimit the selections. Do not enter the parentheses or vertical bars as part of the command.	`(A.B.C.D|<0-4294967295>|)`
`()`	Optional parameter which you can specify or omit. Do not enter the parentheses or vertical bar as part of the command.	`(IFNAME|)`
`{}`	Optional parameters, from which you must select one or more. Vertical bars delimit the selections. Do not enter the braces or vertical bars as part of the command.	`{intra-area <1-255>|inter-area <1-255>|external <1-255>}`
`[]`	Optional parameters, from which you select zero or more. Vertical bars delimit the selections. Do not enter the brackets or vertical bars as part of the command. A '?' before a parameter in square brackets limits that parameter to one occurrence in a command string.	`[<1-65535>|AA:NN|internet|local-AS|no-advertise|no-export]`
`.`	Repeatable parameter. The parameter that follows a period can be repeated more than once. Do not enter the period as part of the command.	`set as-path prepend .<1-65535>`

Variable Placeholders

Table 1-2 shows the tokens used in command syntax use to represent variables for which you supply a value.

Table 1-2: Variable placeholders

Token	Description
WORD	A contiguous text string (excluding spaces)
LINE	A text string, including spaces; no other parameters can follow this parameter
IFNAME	Interface name whose format varies depending on the platform; examples are: eth0, Ethernet0, ethernet0, xe0
A.B.C.D	IPv4 address
A.B.C.D/M	IPv4 address and mask/prefix
X:X::X:X	IPv6 address
X:X::X:X/M	IPv6 address and mask/prefix
HH:MM:SS	Time format
AA:NN	BGP community value
XX:XX:XX:XX:XX:XX	MAC address
<1-5> <1-65535> <0-2147483647> <0-4294967295>	Numeric range

Command Description Format

Table 1-3 explains the sections used to describe each command in this reference.

Table 1-3: Command descriptions

Section	Description
Command Name	The name of the command, followed by what the command does and when should it be used
Command Syntax	The syntax of the command
Parameters	Parameters and options for the command
Default	The state before the command is executed
Command Mode	The mode in which the command runs; see Command Modes
Example	An example of the command being executed

Keyboard Operations

Table 1-4 lists the operations you can perform from the keyboard.

Table 1-4: Keyboard operations

Key combination	Operation
Left arrow or Ctrl+b	Moves one character to the left. When a command extends beyond a single line, you can press left arrow or Ctrl+b repeatedly to scroll toward the beginning of the line, or you can press Ctrl+a to go directly to the beginning of the line.
Right arrow or Ctrl-f	Moves one character to the right. When a command extends beyond a single line, you can press right arrow or Ctrl+f repeatedly to scroll toward the end of the line, or you can press Ctrl+e to go directly to the end of the line.
Esc, b	Moves back one word
Esc, f	Moves forward one word
Ctrl+e	Moves to end of the line
Ctrl+a	Moves to the beginning of the line
Ctrl+u	Deletes the line
Ctrl+w	Deletes from the cursor to the previous whitespace
Alt+d	Deletes the current word
Ctrl+k	Deletes from the cursor to the end of line
Ctrl+y	Pastes text previously deleted with Ctrl+k, Alt+d, Ctrl+w, or Ctrl+u at the cursor

Table 1-4: Keyboard operations (Continued)

Key combination	Operation
Ctrl+t	Transposes the current character with the previous character
Ctrl+c	Ignores the current line and redisplays the command prompt
Ctrl+z	Ends configuration mode and returns to exec mode
Ctrl+l	Clears the screen
Up Arrow or Ctrl+p	Scroll backward through command history
Down Arrow or Ctrl+n	Scroll forward through command history

Show Command Modifiers

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

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

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

```
> show rsvp | ?
  begin     Begin with the line that matches
  exclude   Exclude lines that match
  include   Include lines that match
  redirect  Redirect output
```

Begin Modifier

The `begin` modifier displays the output beginning with the first line that contains the input string (everything typed after the `begin` keyword). For example:

```
# 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
```

You can specify a regular expression after the `begin` keyword, This example begins the output at a line with either “eth3” or “eth4”:

```
# show run | begin eth[3-4]

...skipping
interface eth3
```

```
 shutdown
!
interface eth4
 shutdown
!
interface svlan0.1
 no shutdown
!
route-map myroute permit 3
!
route-map mymap1 permit 10
!
route-map rmap1 permit 3
!
line con 0
 login
line vty 0 4
 login
!
end
```

Include Modifier

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

```
# 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
```

You can specify a regular expression after the `include` keyword. This examples includes all lines with “input” or “output”:

```
#show int eth0 | include (in|out)put
    input packets 597058, bytes 338081476, dropped 0, multicast packets 0
    input errors 0, length 0, overrun 0, CRC 0, frame 0, fifo 0, missed 0
    output packets 613147, bytes 126055987, dropped 0
    output errors 0, aborted 0, carrier 0, fifo 0, heartbeat 0, window 0
```

Exclude Modifier

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

```
# 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
  Administrative Group(s): None
  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
```

You can specify a regular expression after the `exclude` keyword. This example excludes lines with “output” or “input”:


```
# show interface eth0 | exclude (in|out)put
Interface eth0
  Scope: both
  Hardware is Ethernet  Current HW addr: 001b.2139.6c4a
  Physical:001b.2139.6c4a  Logical:(not set)
  index 2 metric 1 mtu 1500 duplex-full arp ageing timeout 3000
  <UP,BROADCAST,RUNNING,MULTICAST>
  VRF Binding: Not bound
  Bandwidth 100m
  DHCP client is disabled.
  inet 10.1.2.173/24 broadcast 10.1.2.255
  VRRP Master of :  VRRP is not configured on this interface.
  inet6 fe80::21b:21ff:fe39:6c4a/64
    collisions 0
```

Redirect Modifier

The `redirect` modifier writes the output into a file. The output is not displayed.

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

The output redirection token (>) does the same thing:

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

Command Modes

Commands are grouped into modes arranged in a hierarchy. Each mode has its own set of commands. Table 1-5 lists the command modes common to all protocols.

Table 1-5: Common command modes

Name	Description
Executive mode	Also called *view* mode, this is the first mode to appear after you start the CLI. It is a base mode from where you can perform basic commands such as `show`, `exit`, `quit`, `help`, `list`, and `enable`.
Privileged executive mode	Also called *enable* mode, in this mode you can run additional basic commands such as `debug`, `write`, and `show`.
Configure mode	Also called *configure terminal* mode, in this mode you can run configuration commands and go into other modes such as interface, router, route map, key chain, and address family.
Interface mode	In this mode you can configure protocol-specific settings for a particular interface. Any setting you configure in this mode overrides a setting configured in router mode.
Router mode	This mode is used to configure router-specific settings for a protocol such as RIP or OSPF.

Command Mode Tree

The diagram below shows the common command mode hierarchy.

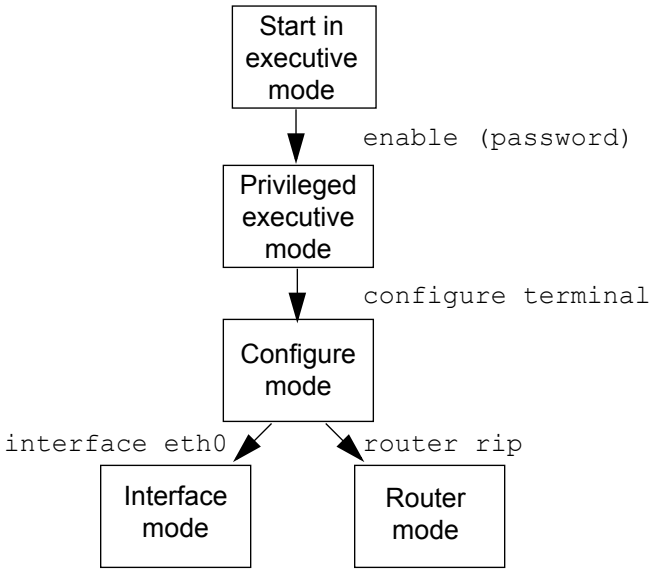

Figure 1-1: Common command modes

To change modes:

1. Enter privileged executive mode by entering `enable` in Executive mode.
2. Enter configure mode by entering `configure terminal` in Privileged Executive mode.

The example below shows starting `imish` and then moving from executive mode to privileged executive mode to configure mode and finally to router mode:

```
# ./imish
> enable mypassword
# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
(config)# router rip
(config-router)#
```

Note: Each protocol can have modes in addition to the common command modes. See the command reference for the respective protocol for details.

Debug Command

Whether the settings you make for a `debug` command persist between sessions depends on the mode where you make the settings:

- When you make settings for a `debug` command in executive mode, the configuration is valid for the current session only and is not saved in the `ZebOS.conf` file.
- When you make settings for a `debug` command in configuration mode, the configuration is retained and saved in `ZebOS.conf` and used even after the session restarts.

CHAPTER 2 Common IMI Commands

This chapter describes common Integration Management Interface (IMI) commands.

banner motd

Use the `banner` command to set the banner message of the day (motd) at login.

After giving the `banner` command, you must write to memory using the write command. If you do not write to memory, the change made by this command is not available when you log into IMISH the next time.

By default, the following banner is displayed on logging.

```
Hello, this is ZebOS-XP(version 4.0051502-Main).
Copyright 2015 IP Infusion Inc.
```

Use the `no` parameter to not display a banner message at login.

Command Syntax

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

Parameters

`LINE`	Specify a custom string.
`default`	Specify the default string.

Command Mode

Configure mode

Examples

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

#configure terminal
(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).

```
#configure terminal
(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

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

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

```
#disable
>
```

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).

```
>enable
#
```

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.

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

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

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

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

hostname

Use this command to set or change the network server name. ZebOS-XP daemons use this name in system prompts and default configuration filenames. This command provides a hostname for login purposes, only. A hostname could be added for each remote system with which the local router communicates and from which it requires authentication. The other router must have a hostname entry for the local router. This entry must have the same password as the local router.

This command is useful for defining host names for special privileges. For example, a hostname `all` requiring no password could be created allowing the users to connect to general information without a password. Setting a hostname using this command takes precedence over setting a hostname in the kernel. If you set the hostname using the CLI, and then set the hostname in the kernel, the hostname set using the CLI remains.

Note: When using the `hostname` 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 hostname) is not available when you log into IMISH the next time.

Use the `no` parameter to disable this function.

Command Syntax

```
hostname WORD
no hostname WORD
```

Parameter

`WORD`	This network name for a system.

Command Mode

All command modes

Example

The following example sets the hostname to “IPI”, and shows the change in the command prompt:

```
#configure terminal
(config)#hostname IPI
IPI(config)#
```

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).

```
#configure terminal
(config)#line console 0
(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).

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

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

show process

Use this command to display information about ZebOS-XP 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.

```
#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
#
```

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

```
(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
(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

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

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

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

```
>enable
(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
(config)#
```

show running-config interface igmp

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

Command Syntax

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

Parameters

IFNAME	Interface name.

Command Mode

Privileged Exec mode and Configure mode

Example

```
#show running-config interface eth1 ip igmp
!
interface eth1
!
```

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

```
#show running-config interface eth1 ip multicast
!
interface eth1
!
```

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

```
>enable
#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 running-config vrf

Use this command to show the running system status and configuration details for a specified VRF instance name.

Command Syntax

```
show running-config vrf WORD
```

Parameters

WORD	Display the VPN routing/forwarding instance name.

Command Mode

Privileged Exec mode

Example

```
>enable
#show running-config vrf xyz
!
ip vrf xyz
 description vrf
 router-id 11.11.11.11
```

show users

Use this command to display information about current users.

Command Syntax

```
show users
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

```
#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 <0-511>
terminal no length <0-511>
```

Parameters

`<0-511>`	Enter the number of lines on screen (0 for no pausing)

Command Mode

Exec mode and Privileged Exec mode

Examples

```
>enable
#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

```
>Enable
#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: The 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

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

CHAPTER 3 IMI Shell Commands

This chapter describes IMI shell 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

```
#configure terminal
#(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
#
```

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.

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

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

logout

Use this command to exit the ZebOS-XP CLI.

Command Syntax

```
logout
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

```
>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

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

mtrace

Use this command to trace the path from a source to a destination branch for a multicast distribution tree. This command is identical in function to the UNIX version of mtrace.

The trace request generated by the `mtrace` command is multicast to the multicast group, to find the last-hop router to the specified destination. The trace then follows the multicast path from destination to source by passing the mtrace request packet via unicast to each hop. Responses are unicast to the querying router by the first-hop router to the source. If no arguments are entered, the router will interactively prompt you for them.

Command Syntax

```
mtrace
mtrace A.B.C.D
mtrace A.B.C.D A.B.C.D
mtrace A.B.C.D A.B.C.D
mtrace 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

```
>enable
5#mtrace 192.168.1.1 192.168.10.1 224.1.1.1
5#mtrace
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

```
>enable
#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
#
```

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

```
#configure terminal
(config)#line vty 0 5
(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: Privilege levels 2-14 are undefined.

Command Syntax

```
show privilege
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

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

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

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

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

```
#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

```
#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
#
```

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 memory.

Command Mode

Privileged Exec mode

Example

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

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

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.

```
#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
```

CHAPTER 4 VLOG Commands

This chapter describes Virtual Router Log (VLOG) commands.

reset log file

Use this command to reset the current, open log file.

Command Syntax

```
reset log file
```

Parameters

None

Command Mode

Privileged Exec mode

Example

```
>enable
#reset log file
```

show vlog all

Use this command to display output of all VLOG show commands described above. For column descriptions, refer to descriptions of the individual commands.

Command Syntax

```
show vlog all
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

```
>enable
#show vlog all

Type     Name     FD  UserVR  AllVrs  VRCnt
tty   /dev/pts/8  12  vr222    ---        1
tty   /dev/pts/4  13  <PVR>    ---        1

VR-Name  VR-Id  PVR-Terms  VR-Terms                LogFile
CurSize
<PVR>        0          1         0           /var/local/zebos/log/pvr/my-log
1624320
vr111        1          0         0                        n/a
n/a
vr222        2          0         1          /var/local/zebos/log/vr222/log-
vr222        0
vr333        3          0         0          /var/local/zebos/log/vr333/log-
vr333        0

Name  Id  MsgCnt        ConTime             ReadTime
NSM    1       1  Fri May-15 21:05:04  Fri May-15 21:05:04
IMI   19       1  Fri May-15 21:05:02  Fri May-15 21:05:02
```

show vlog clients

Use this command to display all attached VLOGD clients. VLOGD clients are Protocol Modules attached to VLOGD. This command is used to show their statistics, for example, connection time, and number of messages received.

Command Syntax

```
show vlog clients
```

Parameters

None

Command Mode

Privileged Exec mode

Displayed Columns

The report columns show the following data:

- Name: Name of protocol module
- Id: Protocol module identifier
- MsgCnt: Number of log messages received from protocol module
- ConTime: Time the connection was established
- ReadTime: Time the last log message was received

Example

```
>enable
#show vlog clients

Name  Id  MsgCnt          ConTime               ReadTime
NSM    1       1     Fri May-15 21:05:04  Fri May-15 21:05:04
IMI   19       1     Fri May-15 21:05:02  Fri May-15 21:05:02
```

show vlog terminals

Use this command to display all active connections where VLOGD is forwarding log output.

Command Syntax

```
show vlog terminals
```

Parameters

None

Command Mode

Privileged exec mode

Displayed Columns

The report columns show the following data:

- Type: Type of terminal
- Name: Device name
- FD: File descriptor identifier
- UserVR: Name of the Virtual Router where the user is logged in
- AllVRs: Indicates whether PVR user requested debug output from all VRs
- VRCnt: Number of VRs a terminal is attached

Example

```
>enable
#show vlog terminals

Type     Name      FD  UserVR  AllVrs  VRCnt
tty   /dev/pts/8  12  vr222    ---        1
tty   /dev/pts/4  13  <PVR>    ---        1
```

show vlog virtual-routers

Use this command to list all Virtual Routers and their available statistics, for example, the number of terminals attached, that VLOGD is aware of.

Command Syntax

```
show vlog virtual-routers
```

Parameters

None

Command Mode

Privileged exec mode

Displayed Columns

The report columns show the following data:

- VR-Name: Virtual router name
- VR-Id: Virtual router identifier
- PVR-Terms: Number of attached PVR terminals
- VR-Terms: Number of attached VR terminals
- LogFile: Name of VR log file (columns is empty if writing to a log file is disabled)
- CurSize: The log file current size

Example

```
>enable
#show vlog virtual-routers

VR-Name  VR-Id  PVR-Terms  VR-Terms LogFile                              CurSize
<PVR>         0  1          0        /var/local/zebos/log/pvr/my-log    1624320
vr111         1  0          0        n/a                                n/a
vr222         2  0          1        /var/local/zebos/log/vr222/log-vr222    0
vr333         3  0          0        /var/local/zebos/log/vr333/log-vr333    0
```

CHAPTER 5 System Commands

This chapter is a reference for system commands.

mv

Use this command to rename (move) a file.

Command Syntax

```
mv LINE
```

Parameters

LINE	Source and destination file names

Command Mode

Exec mode

Examples

```
#mv old-name new-name
```

pwd

Use this command to print the working directory.

Command Syntax

```
pwd
```

Parameters

None

Command Mode

Exec mode

Examples

```
#pwd
```

ip domain-lookup

Use this command to enable DNS hostname-to-address translation.

Use the `no` parameter with this command to disable DNS.

Command Syntax

```
ip domain-lookup
no ip domain-lookup
```

Parameters

None

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ip domain-lookup
```

ip domain-name

Use this command to set the detault domain name used to complete unqualified host names (names without a dotted-decimal domain name).

The `ip domain-list` command is similar to the `ip domain-name` command, except that with the `ip domain-list` command you can define a list of domains, each to be tried in turn.

If a domain list has been created with `ip domain-list`, the default domain name is not used. If there is no domain list, the default domain name is used.

Use the `no` parameter with this command to remove the domain name.

Command Syntax

```
ip domain-name DOMAIN-NAME
no ip domain-name DOMAIN-NAME
```

Parameters

`DOMAIN-NAME`	Domain name, such as company.com

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ip domain-name company.com
```

ip host

Use this command to define static hostname-to-address mappings in DNS. You can specify one or two mappings in a command.

Use the `no` parameter with this command remove a hostname-to-address mapping.

Command Syntax

```
ip host WORD A.B.C.D
ip host WORD A.B.C.D A.B.C.D
ip host WORD (X:X::X:X | A.B.C.D)
ip host WORD (X:X::X:X | A.B.C.D) (X:X::X:X | A.B.C.D)
no ip host WORD A.B.C.D
no ip host WORD A.B.C.D A.B.C.D
no ip host WORD (X:X::X:X | A.B.C.D)
no ip host WORD (X:X::X:X | A.B.C.D) (X:X::X:X | A.B.C.D)
```

Parameters

`WORD`	Hostname, such as company.com
`A.B.C.D`	IPv4 address of the host
`X:X::X:X`	IPv6 address of the host

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ip host company.com 192.0.2.1
```

ip name-server

Use this command to add 1-3 DNS server addresses that are used to translate hostnames to IP addresses.

Use the `no` parameter with this command to remove 1-3 DNS server addresses.

Command Syntax

```
ip name-server A.B.C.D
ip name-server (A.B.C.D) (A.B.C.D)
ip name-server (A.B.C.D) (A.B.C.D) (A.B.C.D)
ip name-server (X:X::X:X | A.B.C.D)
ip name-server (X:X::X:X | A.B.C.D) (X:X::X:X | A.B.C.D)
ip name-server (X:X::X:X | A.B.C.D) (X:X::X:X | A.B.C.D) (X:X::X:X | A.B.C.D)
no ip name-server A.B.C.D
no ip name-server A.B.C.D A.B.C.D
no ip name-server A.B.C.D A.B.C.D A.B.C.D
no ip name-server (X:X::X:X | A.B.C.D)
no ip name-server (X:X::X:X | A.B.C.D) (X:X::X:X | A.B.C.D)
no ip name-server (X:X::X:X | A.B.C.D) (X:X::X:X | A.B.C.D) (X:X::X:X | A.B.C.D)
```

Parameters

`A.B.C.D`	IPv4 address of the name server
`X:X::X:X`	IPv6 address of the name server

Command Mode

Configure mode

Examples

```
#configure terminal
(config)#ip name-server 123.70.0.23
```

show hosts

Use this command to display the DNS name servers and domain names.

Command Syntax

```
show hosts
```

Parameters

None

Command Mode

Exec mode and Privilege Exec mode

Example

```
#show hosts
Default domain is ipinfusion.com
Domain list: ipi.com
Name/address lookup uses domain service
Name servers are 10.10.0.2 10.10.0.88
```

show running-config dns

Use this command to show the running configuration for DNS.

Command Syntax

```
show running-config dns
```

Parameters

None

Command Mode

Exec mode and Privilege Exec mode

Example

```
#show running-config dns
```

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