ZebOS-XP®
Network Platform

Version 1.4
Extended Performance

Virtual Routing
Command Reference

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Contents

Preface

This document describes the ZebOS-XP commands for Virtual Routing (VR) and Virtual Router Forwarding (VRF).

Audience

This document is intended for network administrators and other engineering professionals who configure and manage VR and VRF.

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 and appendices:

- Chapter 1, *Command Line Interface*
- Chapter 2, *Virtual Routing Commands*
- Chapter 3, *Logical Switch Router Commands*

Related Documents

The following guides are related to this document:

- *Installation Guide*
- *Network Services Module Command Reference*
- *Network Services Module Developer Guide*
- *Network Services Module Command Reference*
- *Architecture 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 nsm virtual-router brief`
`lowercase`	Keywords that you enter exactly as shown in the command syntax.	`show nsm virtual-router brief`
`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.

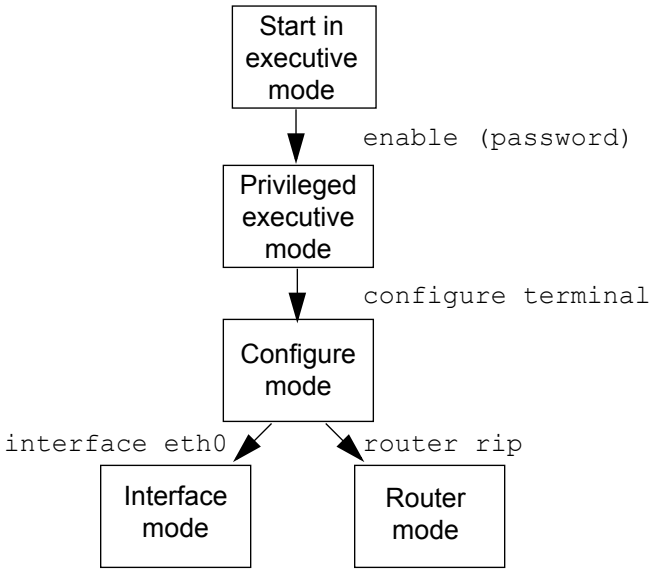


Figure 1-1: Common command modes

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

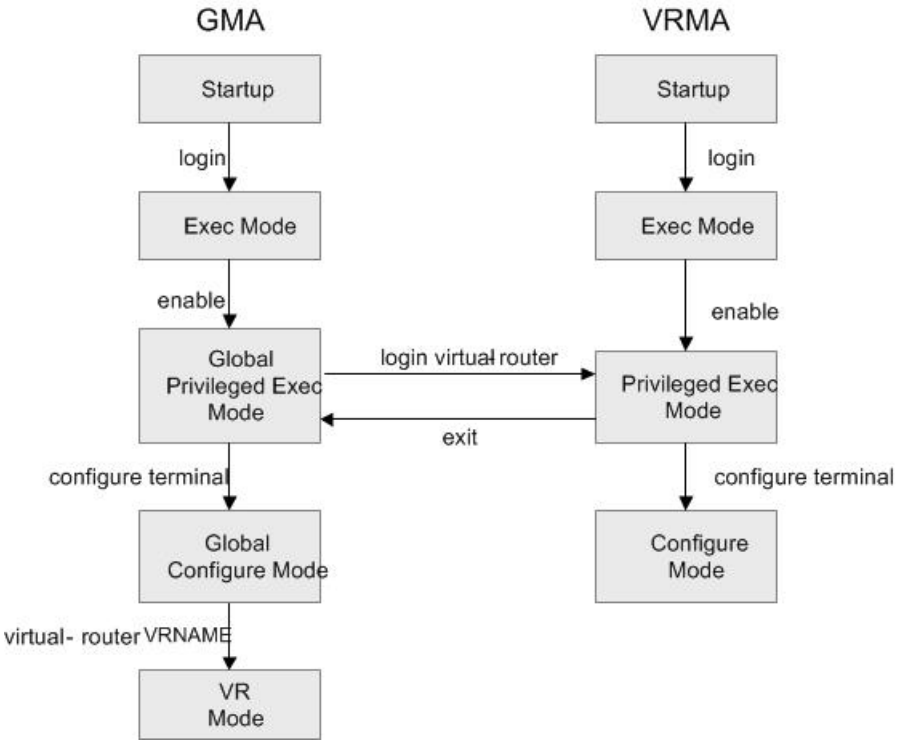
Whether the settings you make for a `debug` command persist between sessions depends on the mode where you make the settings:

- 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.

Virtual Routing Command Modes

The Global Management Authority (GMA) resides in the router and provides services to each VR management authority (VRMA), but does not communicate on its own to resources outside the router.

Global Administrators log on to the GMA and virtual router administrators log on to the VRMA using similar commands. The GMA allows users to log on to any VR.



Executing Commands in the GMA and VRMA Context

Some commands available in global configuration mode are not available in VR configuration mode. Chapter 2, *Virtual Routing Commands* describes these commands.

When logged into the VRMA using the login virtual-router command or as a VR user, several ZebOS-XP commands are executed only for the VR context as described below.

hostname Command

Using the `hostname` command in the VRMA changes the host name for the specific virtual router only. It does not change the hostname of the system or of any other virtual router.

interface Command

This command prevents unauthorized access to interfaces, ensuring that:

- VR administrators can only configure interfaces that they own. Attempts to configure interfaces not owned by the VR will cause an error message indicating that the interface does not exist.
- VR administrators are not allowed to create new interfaces. Doing so would violate security constraints. All interfaces that need to be added must be done from the global context.
- Global administrators can create new interfaces and configure all existing interfaces. The only constraint is that once an interface has been bound to a virtual router, it must be configured from that VRMA or unbound first.

- A maximum of one user (global or VR) can configure an interface at one time.
- Interfaces cannot be deleted while they are being configured by any user.

CHAPTER 2 Virtual Routing Commands

This chapter includes an alphabetical listing of all available virtual router commands. It includes the following commands:

configuration file

This command loads the default configuration file for the VR/VRF

Use the `no` parameter to resume the use of the default.

Command Syntax

```
configuration file WORD
no configuration file
```

Parameters

`WORD`	Specify the full path and file name of the configuration file.
`default`	Specify the configuration filename as default.

Command Mode

VR mode

Examples

```
#configure terminal
(config)#virtual-router VR1
(config-vr)#configuration file default

(config)#virtual-router VR1
(config-vr)#no configuration file
(config)#ip vrf vrf1
(config)#no ip vrf vrf1
```

description

Use this command to add a description tag to a virtual router instance.

Use the `no` parameter to remove a description.

Command Syntax

```
description LINE
no description
```

Parameters

`LINE`	Specify a description for the virtual router.

Command Mode

VR mode

Examples

```
#configure terminal
(config)#virtual-router VR1
(config-vr)#description VR1 has been created for CLI testing

(config)#virtual-router VR1
(config-vr)#no description
#configure terminal
(config)#ip vrf vrf1
(config-vr)#description vrf1 has been created for CLI testing
```

ip vrf

Use this command to

- Create new VRF
- Enter the Configure mode to configure VRF parameters.

Use the no parameter with this command to disable the specified vrf.

Command Syntax

```
ip vrf WORD
no vrf WORD
```

Parameters

`WORD`	Specify the name of the virtual router.

Command Mode

Configure mode

Example

In this configuration, interface `eth1` is bound to the Virtual Router `VR1`.

```
#configure router
(config)#ip vrf vrf1
(config-vrf)#
```

load

Use this command to load IPv4 protocol modules to a virtual router.

Use the `no` parameter with this command to remove the specified protocol module from the VR.

Command Syntax

```
load (ospf|bgp|rip|trill|isis|ptp|pim)
no load (ospf|bgp|rip|trill|isis|ptp|pim)
```

Parameters

`bgp`	Loads the BGP module to this VR.
`isis`	Loads the ISIS module to this VR.
`ospf`	Loads the OSPF module to this VR.
`pim`	Loads the PIM module to this VR.
`rip`	Loads the RIP module to this VR.
`trill`	Loads the TRILL module to this VR.
`ptp`	Loads the PTP module to this VR.

Command Mode

VR mode

Examples

```
#configure terminal
(config)#virtual-router VR1
(config-vr)#load bgp

#configure terminal
(config)#virtual-router VR1
(config-vr)#no load bgp
```

load IPv6

Use this command to load IPv6 protocol modules to a virtual router.

Use the `no` parameter with this command to remove the specified protocol module from the VR.

Command Syntax

```
load ipv6 (ospf|rip)
```

Parameters

`ospf`	Loads the OSPFv3 module to this VR for the IPv6 protocol module.
`rip`	Loads the RIPng module to this VR for the IPv6 protocol module.

Command Mode

VR mode

Examples

```
(config)#virtual-router VR1
(config-vr)#load ipv6 ospf
```

login virtual-router

This command is used to jump from global configuration mode to a particular VR configuration mode.

Note: This command can be used only by the administrator. The administrator can login from GMA to VR for administration purposes.

Command Syntax

```
login virtual-router WORD
```

Parameters

WORD	Specify the name of the virtual router.

Command Mode

Privileged Exec mode

Example

```
1#login virtual-router VR1

 version 7.7.2.t78 candidiasis 06/23/10 18:49:52
1>>en
#con t
(config)#ip vrf vrf1
(config)#router ospf 1 vrf1
(config)#no router ospf 1
(config-router)#router rip
(config-router)#address-family ipv4 vrf vrf1
(config)#no router rip
```

show ip route virtual-router

Use this command to display the IP routing table for a virtual router.

Command Syntax

```
show ip route virtual-router WORD (database|)
show ip route virtual-router WORD (database|)
  (bgp|connected|isis|kernel|ospf|rip|static)
```

Parameters

`bgp`	Display Border Gateway Protocol (BGP) information.
`connected`	Display connected information.
`database`	Display IPv6 routing table database information.
`isis`	Display ISO IS-IS information.
`kernel`	Display kernel information.
`ospf`	Display Open Shortest Path First (OSPF) information.
`rip`	Display Routing Information Protocol (RIP) information.
`static`	Display static routes.

Command Mode

Exec mode and Privileged Exec mode

Examples

```
#show ip route virtual-router new-vr
```

show nsm virtual-router

Use this command to display NSM information for a virtual router.

Command Syntax

```
show nsm virtual-router (brief|detail|)
```

Parameters

`brief`	Display brief NSM information.
`detail`	Display connected NSM information.

Command Mode

Privileged Exec mode

Examples

```
#show nsm virtual-router brief
```

show running-config virtual-router

Use this command to display the contents of the running configuration on a virtual router.

Command Syntax

```
show running-config virtual-router <1-512>
show running-config virtual-router WORD
```

Parameters

WORD	Display the name of the virtual router.
<1-512>	Display the current configuration mode.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output of this command displaying running configuration for the specified Virtual Router `v1`.

```
#show running-config virtual-router v1
 !
 no service password-encryption
 !
 interface eth1
  ip address 10.10.10.121/24
  ipv6 address fe80::202:b3ff:fed5:9553/64
 !
 end
localhost.localdomain#show running-config
!
no service password-encryption
!
mpls propagate-ttl
!
no feature dhcp
!
line con 0
 login
line vty 0 39
 login
!
end
```

show VR and VRF

Use this command to display a list of all virtual routers and their descriptions.

Command Syntax

```
show virtual-router
show virtual-router WORD
show virtual-router <1-512>
```

Parameters

WORD	Display the name of the virtual router.
<1-512>	Display the current configuration mode.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output of this command displaying two Virtual Routers and their descriptions:

```
#show virtual-router
Virtual Router vr1
  VR-ID: 1
  Router-ID: (unset)
  Interfaces: eth1

Virtual Router vr2
  VR-ID: 2
  Router-ID: (unset)
  Interfaces: eth2
localhost.localdomain#show ip vrf vrf0
VRF vrf0, FIB ID 3
Router ID: 3.3.3.1 (automatic)
Interfaces:
  eth1
  eth2
localhost.localdomain#show ip vrf vrf1
VRF vrf1, FIB ID 4
Router ID is not set
Interfaces:
```

show virtual-router ip

Use this command to display a list of all virtual routers and their descriptions.

Command Syntax

```
show virtual-router WORD ip route (database|)
show virtual-router WORD ip route (database|)
  (bgp|connected|isis|kernel|ospf|rip|static)
```

Parameters

`WORD`	Display the name of the virtual router.
`database`	Display IP routing table database information.
`bgp`	Display Border Gateway Protocol (BGP) information.
`connected`	Display connected information.
`isis`	Display ISO IS-IS information.
`kernel`	Display kernel information.
`ospf`	Display Open Shortest Path First (OSPF) information.
`rip`	Display Routing Information Protocol (RIP) information.
`static`	Display static routes.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output of this command displaying two Virtual Routers and their descriptions:

```
#show virtual-router
Virtual Router vr1
  VR-ID: 1
  Router-ID: (unset)
  Interfaces: eth1

Virtual Router vr2
  VR-ID: 2
  Router-ID: (unset)
  Interfaces: eth2
#
```

show vlog virtual-routers

Use this command to display virtual log information for a virtual router.

Command Syntax

```
show vlog virtual-routers
```

Parameters

None

Command Mode

Privileged Exec mode

Examples

```
#show vlog virtual-routers

#
```

username

This command is used by the global administrator to add a login username to a virtual router. Use the `no` parameter to remove the username.

Command Syntax

```
username WORD
no username
```

Parameters

`WORD`	Specify the user name.

Command Mode

VR mode

Example

```
#configure terminal
(config)#virtual-router VR1
(config-vr)#username QA 3 QA123
```

virtual-router

The Global administrator executes this command to create a new virtual router and to configure VR parameters.

Commands that appear in VR mode set startup parameters for the virtual router prior. Only some of these commands can be executed once the VR has been loaded.

Use the `no` parameter with this command to disable the specified virtual router.

Command Syntax

```
virtual-router WORD
no virtual-router WORD
```

Parameters

`WORD`	Specify the name of the VR.

Command Mode

Configure mode

Example

```
#router
(config)#virtual-router VR1
(config-vr)#
```

virtual-router forwarding

Use this command to bind an interface name to the virtual router name. This command informs all ZebOS-XP clients about it.

Use the `no` parameter to remove the association.

Command Syntax

```
virtual-router forwarding WORD
no virtual-router forwarding WORD
```

Parameters

`WORD`	Specify the name of the virtual router.

Command Mode

Interface mode

Example

In this configuration, interface `eth1` is bound to the Virtual Router `VR1`.

```
#configure terminal
(config)#interface eth1
(config-if)#virtual-router forwarding VR1

(config)#interface eth1
(config-if)#no virtual-router forwarding VR1
```

CHAPTER 3 Logical Switch Router Commands

This chapter includes an alphabetical listing of all available Logical Switch Router commands. It includes the following commands:

allocate interface

Use this command to bind the interface to LSR instance.

Use the `no` parameter to unbind the interface to LSR instance.

Note: This command can be used in default LSR only.

Command Syntax

```
allocate interface IFNAME
no allocate interface IFNAME
```

Parameters

`IFNAME`	Specify the interface name.

Command Mode

LSR-config mode

Examples

```
#configure terminal
(config)#virtual-router VR1
(config-test-lsr)#allocate interface eth1

(config-test-lsr)#no allocate interface eth1
```

lsr name

Used this command to create or specify a LSR and enter LSR configuration mode.

Use the `no` parameter to delete a LSR.

Command Syntax

```
lsr NAME
no lsr NAME
```

Parameters

`NAME`	Specify the name of a LSR.

Command Mode

Configuration mode

Examples

```
#configure terminal
(config)#lsr test-lsr
Test-lsr-ZebOS#

#configure terminal
(config)#no lsr test-lsr
```

feature daemon

Use this command to load a feature in the LSR specified.

Use the `no` parameter to unload features in the LSR specified.

Note: This command can be used in default LSR only.

Command Syntax

```
feature daemon-name
no feature daemon-name
```

Parameters

`daemon`	Specify the daemon name.

Examples

```
#(config)#lsr first
#(config-lsr)#feature ospfd

#(config-lsr)#no feature ospfd
#(config-lsr)#
```

lsr-move

Used this command to specifies whether an interface can be moved from the default LSR to a non-default LSR.

Every interface by default can be moved.

Command Syntax

```
lsr-move (enable|disable)
```

Command Mode

Interface mode

Examples

```
(config)#interface p2p3
(config-if)#lsr-move enable
```

mac-address

Used this command to set the MAC address for an LSR.

Use the `no` parameter to remove the mac address for an LSR.

Command Syntax

```
mac-address MAC
no mac-address MAC
```

Parameters

`MAC`	Specify the MAC address.

Command Mode

LSR mode

Examples

```
(config)#lsr first
(config-lsr)#mac-address 1234.1234.1234

(config)#lsr first
(config-lsr)#no mac-address 1234.1234.1234
```

leave lsr

Use this command to switch back to the default LSR.

Command Syntax

```
leave lsr
```

Command Mode

Configure mode

Example

```
#leave lsr
```

switch lsr

Use this command to switch to another LSR from the default LSR.

Note: This command can be used in the default LSR only.

Command Syntax

```
switch-lsr LSR-NAME
```

Parameters

LSR-NAME	Name of the LSR

Command Mode

Privileged exec mode

Example

```
#switch-lsr test-lsr
Test-lsr-ZebOS#
```

show lsr

Use this command to display LSR information.

Note: In the default LSR, this command displays a list of all LSRs and their descriptions. In non-default LSRs, this command displays the LSR description for the current LSR only.

Command Syntax

```
show lsr (LSR_NAME ) (detail)
```

Parameters

LSR-NAME	Name of the LSR
detail	Details

Command Mode

Privileged Exec mode

Examples

```
# show lsr
lsr_id lsr_name state
------ -------- -----
1   switch active
2   Payroll active
3   MyLSR active

switch# show lsr detail
lsr id: 1
lsr name: switch
lsr state: active
lsr start time: Thu May 14 08:14:39 2009
lsr restart count: 0

lsr id: 2
lsr name: payroll
lsr state: active
lsr start time: Thu May 14 08:15:22 2009
lsr restart count: 0
```

show lsr process-list

Use this command to display the process names and identifiers that are running.

Note: This command can be used in the default LSR only.

Command Syntax

```
show lsr process-list (lsr-name LNAME|)
```

Parameters

LSR-NAME	Name of the LSR

Command Mode

Privileged Exec mode

Examples

```
show lsr process-list
LSR Process Details:

LSR ID: 2,  LSR Name: first

  PROCESS NAME                     PID
  -------------------------------- ---
Process_name         Process_name_pid
nsm                              1914
  ribd                             1917
  imi                              1920
  hostpd                      1934

LSR ID: 3,  LSR Name: test

  PROCESS NAME                     PID
  -------------------------------- ---
  nsm                              2340
  ribd                             2343
  imi                              2351
```

show lsr membership

Use this command to display the interface membership information for the LSR.

Note: In the default LSR, this command displays a list of all LSRs and their descriptions. In non-default LSRs, this command displays the LSR description for the current LSR only.

Command Syntax

```
show lsr membership
```

Example

```
(config)# show lsr membership

lsr_id: 1  lsr_name: switch  interfaces:
eth0  eth1  eth3  eth4
eth6  eth8

lsr_id: 2  lsr_name: Payroll  interfaces:
eth2  eth5

lsr_id: 3  lsr_name: MyLSR  interfaces:
eth7  eth9


switch# show LSR membership status
LSR_id: 1 LSR_name: switch interfaces:
Port   Status
----   ----------
eth1   OK
eth2   OK
eth3   OK
eth4   OK
```

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