BIG-IP® Advanced Routing™
Routing Information Protocol
Command Reference Guide

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CHAPTER 1 ZebOS Command Line Interface Environment

Network administrators and application developers who configure the ZebOS® Network Platform use this command reference which includes the following information:

- An overview of the ZebOS Command Line Interface
- A complete reference of the commands used for Routing Information Protocol (RIP) configuration

You can give the commands described in this manual locally from the console of a device running ZebOS or remotely from a terminal emulator such as `putty` or `xterm`.

Command Line Interface Overview

The ZebOS® Command Line Interface (CLI) is a text-based command interface. Each command is usually associated with a specific task. The commands can be used 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 daemons, see the *ZebOS Network Platform Installation Guide.*

1. Start your terminal emulator and connect to the device or go to the console of the device running ZebOS.
2. Connect to the directory where you installed the ZebOS executables.
3. Start the Network Services Manager (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 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 *ZebOS Network Platform 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:

```
ZebOS> show ?
```

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
...
```

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

```
ZebOS> show de?
  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 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`:

```
ZebOS> sh
```

Press the tab key. The CLI displays:

```
ZebOS> show
```

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

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

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

Command Abbreviations

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

```
sh in eth0
```

is an abbreviation for the `show interface` command.

Command Line Errors

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

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

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

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 and the negated form does not take a parameter.

Typographic Conventions

The following table describes the typographic conventions used in this reference.

Convention	Description	Example
`Monospaced font`	Command strings entered on a command line	`show ip ospf`
`lowercase`	Keywords that you enter exactly as shown in the command syntax.	`show ip ospf`
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

The command syntax use the following tokens to represent command line variables for which you supply a value:

Token	Description
WORD	A contiguous text string (excluding spaces), such as IFNAME for the name of an interface
LINE	A text string, including spaces; no other parameters can follow this parameter
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

The following table explains the sections used to describe each command in this reference.

Section	Description
Command Name	The command, 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 status before the command is executed
Command Mode	The name of the mode in which this command is used. Examples include Exec or Configure modes.
Example	An example of the command being executed

Keyboard Operations

You can perform these operations from the keyboard:

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
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 Tokens

You 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

You 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 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:

```
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
```

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

```
ZebOS#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:

```
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
```

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

```
ZebOS#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:

```
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
  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”:

```
ZebOS#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.

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

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

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

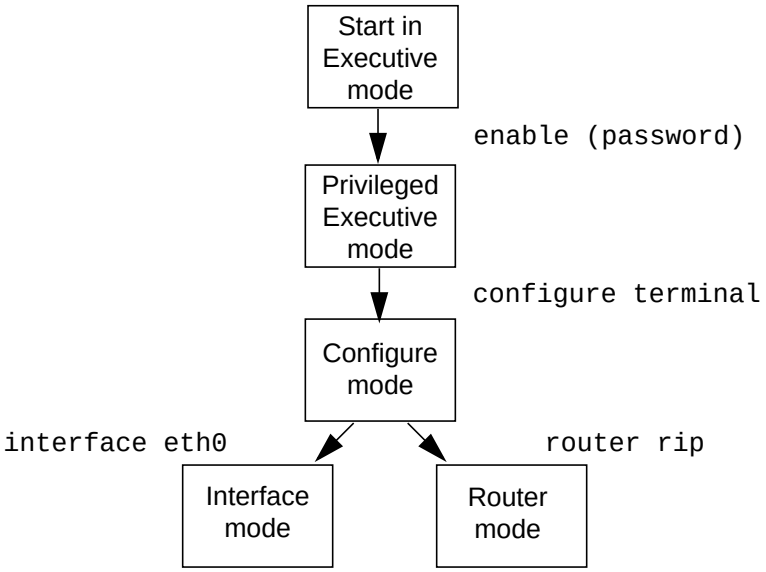
Common Command Modes

Commands are grouped into modes arranged in a hierarchy. Each mode has its own set of commands. The command modes common to all protocols are listed below.

Name	Description
Executive Mode	Also called the *view* mode, this 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 the *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.

Common Command Mode Tree

The diagram below shows the common command mode hierarchy.



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

See the *ZebOS Network Platform NSM Command Line Interface Reference Guide* for information about other command modes.

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

CHAPTER 2 Routing Information Protocol Commands

This chapter provides an alphabetized reference for each of the Routing Information Protocol (RIP) commands, which support IPv4. It includes the following commands:

accept-lifetime

Use this command to specify the time period during which the authentication key on a key chain is received as valid.

Use the `no` option with this command to disable it.

See Appendix A, Routing Information Protocol Authentication for information on how this command is related to the other authentication commands.

Command Syntax

```
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> HH:MM:SS <1-31> MONTH <1993-2035>
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> HH:MM:SS MONTH <1-31> <1993-2035>
accept-lifetime HH:MM:SS MONTH <1-31> <1993-2035> HH:MM:SS <1-31> MONTH <1993-2035>
accept-lifetime HH:MM:SS MONTH <1-31> <1993-2035> HH:MM:SS MONTH <1-31> <1993-2035>
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> infinite
accept-lifetime HH:MM:SS MONTH <1-31> <1993-2035> infinite
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> duration <1-2147483646>
accept-lifetime HH:MM:SS MONTH <1-31> <1993-2035> duration <1-2147483646>
no accept-lifetime
```

Parameters

`HH:MM:SS`	Specify the start time of accept-lifetime in hours, minutes and seconds.
`<1-31>`	Specify the day of the month to start.
`MONTH`	Specify the month of the year to start (the first three letters of the month, for example, `Jan.`).
`<1993-2035`	Specify the year to start.
`HH:MM:SS`	Specify the time when accept-lifetime expires in hours, minutes and seconds.
`<1-31>`	Specify the day of the month to expire.
`MONTH`	Specify the month of the year to expire (the first three letters of the month, for example, `Jan.`).
`<1993-2035>`	Specify the year to expire.
`duration`	Specify the duration of the key in seconds <1-2147483646>.
`infinite`	Specify the end time to never expire.

Command Mode

Keychain-key mode

Examples

The following example shows the setting of accept-lifetime for `key1` on the key chain named `mychain`.

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#accept-lifetime 03:03:01 Dec 3 2004 04:04:02 Oct 6
2006
```

```
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#no accept-lifetime
```

cisco-metric-behavior

Use this command to enable the metric update consistent with Cisco.

Use either the `no` or `disable` parameter with this command to disable this feature.

Command Syntax

```
cisco-metric-behavior (enable|disable)
no cisco-metric-behavior
```

Parameters

`enable`	Enable updating the metric consistent with Cisco.
`disable`	Disable updating the metric consistent with Cisco.

Default

By default, the Cisco metric-behavior is disabled.

Command Mode

Router mode

Example

This example shows how to enable the metric update behavior to be consistent with Cisco in the Router mode.

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS (config-router)#cisco-metric-behavior enable
```

clear ip rip route

Use this command to clear specific data from the RIP routing tables.

Using this command with the `all` parameter, clears the RIP table of all the routes. If you do not want that your RIP network to be deleted, use the `redistribute connected` command and make the RIP network a connected route. To delete the RIP routes learned from neighbor and also keep the RIP network intact, use the `rip` (`clear ip rip route rip`) parameter with this command.

Command Syntax

```
clear ip rip route (A.B.C.D/M|rip|kernel|connected|static|ospf|isis|bgp|all)
```

Parameters

`A.B.C.D/M`	Removes entries which exactly match this destination address from RIP routing table.
`bgp`	Removes only BGP routes from the RIP routing table.
`connected`	Removes entries for connected routes from the RIP routing table.
`isis`	Removes only IS-IS routes from the RIP routing table
`kernel`	Removes kernel entries from the RIP routing table.
`ospf`	Removes only OSPF routes from the RIP routing table.
`rip`	Removes only RIP routes from the RIP routing table.
`static`	Removes static entries from the RIP routing table.
`all`	Removes the entire RIP routing table.

Command Mode

Privileged Exec mode

Examples

```
ZebOS#clear ip rip route 10.0.0.0/8
ZebOS#clear ip rip route ospf
```

debug rip

Use this command to specify the options for the displayed debugging information for RIP events, RIP packets and RIP NSM.

Use the `no` parameter with this command to disable all debugging. The `undebug` alias command can also be used.

Command Syntax

```
debug rip (all|)
debug rip events
debug rip nsm
debug rip packet (recv|send|) (detail|)
no debug rip (all|)
no debug rip events
no debug rip nsm
no debug rip packet (recv|send|) (detail|)
undebug rip (all|)
undebug rip events
undebug rip nsm
undebug rip packet (recv|send|) (detail|)
```

Parameters

`all`	Debug all RIP information.
`events`	Debug RIP events.
`nsm`	Debug RIP and NSM communications.
`packet`	Debug RIP packets, only
`recv`	Debug received packets.
`send`	Debug sent packets.
`detail`	Display detailed information for the sent or received packet.

Default

Disabled

Command Mode

Privileged Exec mode and Configure mode

Examples

```
ZebOS#debug rip events
ZebOS#debug rip packet send detail
ZebOS#debug rip nsm
```

default-information originate

Use this command to add default routes to the RIPng updates.

Use the no parameter with this command to disable this feature.

Command Syntax

```
default-information originate
no default-information originate
```

Parameters

None

Default

Disabled

Command Mode*

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#default-information originate
```

default-metric

Use this command to specify the metrics to be assigned to redistributed routers.

This command is used in conjunction with the `redistribute` command to make the routing protocol use the specified metric value for all redistributed routes. A default metric is useful in redistributing routes with incompatible metrics. Every protocol has different metrics and can not be compared directly. Default metric provides the standard to compare. All routes that are redistributed will use the default metric.

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

Command Syntax

```
default-metric <1-16>
no default-metric (<1-16>|)
```

Parameter

`<1-16>`	Specify the default metric.

Default

By default, the metric value is set to 1.

Command Mode

Router mode

Examples

This example assigns the cost of 30 to the OSPF routes which are redistributed into RIP.

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#redistribute ospf
ZebOS(config-router)#default-metric 10
```

distance

Use this command to set the administrative distance. The administrative distance is a feature used by the routers to select the path when there are two or more different routes to the same destination from two different routing protocols. A smaller administrative distance indicating a more reliable protocol.

Use the no parameter with this command to disable this function.

Command Syntax

```
distance <1-255>
distance <1-255> A.B.C.D/M (WORD|)
no distance (<1-255>|)
no distance <1-255> A.B.C.D/M (WORD|)
```

Parameters

`<1-255>`	Specify the administrative distance value.
`A.B.C.D./M`	Specify the network prefix and length
`WORD`	Specify the access list name.

Default

By default, the administrative distance is 120.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#distance 8 10.0.0.0/8 mylist
```

distribute-list

Use this command to filter incoming or outgoing route updates using an access list or a prefix list. You can filter out incoming or outgoing route updates using an access list or a prefix list. If you do not specify the name of the interface, the filter will be applied to all the interfaces.

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

Command Syntax

```
distribute-list WORD (in|out) (IFNAME|)
distribute-list prefix WORD (in|out) (IFNAME|)
no distribute-list WORD (in|out) (IFNAME|)
no distribute-list prefix WORD (in|out) (IFNAME|)
```

Parameters

`WORD`	Specify the IPv4 access-list number or name to use.
`prefix`	Filter prefixes in routing updates.
`WORD`	Specify the name of the IPv4 prefix-list to use.
`in`	Filter incoming routing updates.
`out`	Filter outgoing routing updates.
`IFNAME`	Specify the name of the interface on which distribute-list applies.

Default

Disabled

Command Mode

Router mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#distribute-list prefix myfilter in eth0
```

ip rip authentication key-chain

Use this command to enable RIPv2 authentication on an interface and specify the name of the key chain to be used. If you do not configure a key chain results in no authentication.

Use the no parameter with this command to disable this function.

See Appendix A, Routing Information Protocol Authentication for information on how this command is related to the other authentication commands.

Command Syntax

```
ip rip authentication key-chain LINE
no ip rip authentication key-chain
```

Parameters

LINE	Specify the name of the key chain.

Command Mode

Interface mode

Examples

In the following example, interface eth0 is configured key-chain authentication and the name is specified as mykey. This name is used to enter the key-chain mode to specify the password. See the key command.

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#ip rip authentication key-chain mykey
```

ip rip authentication mode

Use this command to specify the type of authentication mode used for RIP v2 packets.

Use the `no` parameter with this command to restore clear text authentication.

See Appendix A, Routing Information Protocol Authentication for information on how this command is related to the other authentication commands.

Refer to the *ZebOS Network Platform Installation Guide* for information on prerequisites for MD5 authentication.

Command Syntax

```
ip rip authentication mode md5
ip rip authentication mode text
no ip rip authentication mode
```

Parameters

`md5`	Uses the keyed MD5 authentication algorithm.
`text`	Specify the clear text or simple password authentication.

Default

Text authentication is enabled

Command Mode

Interface mode

Examples

The following example shows `md5` authentication configured on the `eth1` interface, ensuring authentication of RIP packets received.

```
ZebOS#configure terminal
ZebOS(config)#interface eth1
ZebOS(config-if)#ip rip authentication mode md5
```

ip rip authentication string

Use this command to specify the authentication string or password used by a key.

The ZebOS implementation provides the choice of configuring authentication for single key or multiple keys at different times. Use this command to specify password for a single key on an interface.

Use the no parameter with this command to disable this feature.

See Appendix A, Routing Information Protocol Authentication for information on how this command is related to the other authentication commands.

Command Syntax

```
ip rip authentication string LINE
no ip rip authentication string
```

Parameters

LINE	Specify the authentication string or password used by a key.

Command Mode

Interface mode

Examples

In the following example, the interface eth1 is configured to have an authentication string as guest, any receiving RIP packet in that interface should have the same string as password.

```
ZebOS#configure terminal
ZebOS(config)#interface eth1
ZebOS(config-if)#ip rip authentication string guest
```

ip rip receive-packet

Use this command to configure the interface to enable the reception of RIP packets.

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

Command Syntax

```
ip rip receive-packet
no ip rip receive-packet
```

Parameters

None

Default

Receive-packet is enabled

Command Mode

Interface mode

Example

This example shows packet receiving being turned on for interface `eth0`.

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#ip rip receive-packet
```

ip rip receive version

Use this command to receive specified version of RIP packets on an interface basis using version control, and override the setting of the version command.

Use the no form of this command to use the setting established by the version command.

Command Syntax

```
ip rip receive version (1|2)
ip rip receive version 1 2
ip rip receive version 2 1
no ip rip receive version
```

Parameters

1	Specify acceptance of RIP version 1 packets on the interface.
2	Specify acceptance of RIP version 2 packets on the interface.
1 2	Specify acceptance of RIP version 1 and version 2 packets on the interface.
2 1	Specify acceptance of RIP version 2 and version 1 packets on the interface.

Default

Version 2

Command Mode

Interface mode

Examples

In the following example, interface eth1 in configured to receive both RIP version 1 and 2 packets.

```
ZebOS#configure terminal
ZebOS(config)#interface eth1
ZebOS(config-if)#ip rip receive version 1 2
```

ip rip send-packet

Use this command to enable sending RIP packets through the current interface.

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

Command Syntax

```
ip rip send-packet
no ip rip send-packet
```

Parameters

None

Default

Send packet is enabled.

Command Mode

Interface mode

Example

This example shows packet sending being turned on for interface `eth0`.

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#ip rip send-packet
```

ip rip send version

Use this command to send RIP packets on an interface using version control. In addition to version 1 and version 2, compatible version packets can be specified. With the parameter 1-compatible, a version 2 RIP interface will broadcast the packets instead of multicasting them.

This command applies to a specific interface and overrides any the version specified by the `version` command.

Use the no parameter with this command to use the global RIP version control rules.

Command Syntax

```
ip rip send version (1|2|1-compatible)
ip rip send version 1 2
ip rip send version 2 1
no ip rip send version
```

Parameters

`1`	Specify sending RIP version 1 packets out of an interface.
`2`	Specify sending RIP version 2 packets out of an interface.
`1-compatible`	Specify sending RIP version 1 compatible packets from a version 2 RIP interface.

Default

Version 2

Command Mode

Interface mode

Examples

In the following example, interface eth1 is configured to send both RIP version 1 and 2 packets.

```
ZebOS#configure terminal
ZebOS(config)#interface eth1
ZebOS(config-if)#ip rip send version 1 2
```

ip rip split-horizon

Use this command to perform the split-horizon action on the interface

This command helps avoid including routes in updates sent to the same gateway from which they were learned. Using the `split horizon` command omits routes learned from one neighbor, in updates sent to that neighbor. Using the `poisoned` parameter with this command includes such routes in updates, but sets their metrics to infinity. Thus, advertising that these routes are not reachable.

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

Command Syntax

```
ip rip split-horizon
ip rip split-horizon poisoned
no ip rip split-horizon
```

Parameter

`poisoned`	Performs split-horizon with poisoned reverse.

Default

Split horizon poisoned

Command Mode

Interface mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#ip rip split-horizon poisoned
```

key chain

Use this command to enter the key chain management mode and configure a key chain with a key chain name. This command allows you to enter the Keychain mode to specify keys on this key chain.

Command Syntax

```
key chain WORD
no key chain WORD
```

Parameters

WORD	Specify the name of the key chain to manage.

Command Mode

Configure mode

Examples

The following example shows the creation of a key chain named `mychain` and the change to keychain mode:

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#
```

key

Use this command to manage, add or delete authentication keys in a key-chain. This command allows you to enter the Keychain-key mode to set a password for the key.

Use the no option with this command to disable this feature.

See Appendix A, Routing Information Protocol Authentication for information on how this command is related to the other authentication commands.

Command Syntax

```
key <0-2147483647>
no key <0-2147483647>
```

Parameters

`<0-2147483647>` Specify a key identifier.

Default

By default, VoiceVector uses level-1-2 if there is no Level-2 instance nor a Level-1-2 instance. Otherwise, it uses level-1.

Command Mode

Keychain mode

Examples

In the following example, the password for `key 1` in the key chain named `mychain` is set to `prime`:

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#key-string prime

ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#no key-string
```

key chain

Use this command to enter the key chain management mode and to configure a key chain with a key chain name. This command allows you to enter the keychain mode to specify keys on this key chain.

Use the no option with this command to disable this feature.

See Appendix A, Routing Information Protocol Authentication for information on how this command is related to the other authentication commands.

Command Syntax

```
key chain WORD
no key chain WORD
```

Parameter

WORD	Specify the name of the key chain to manage.

Command Mode

Configure mode and Keychain mode

Examples

The following example shows the creation of a key chain named `mychain` and the change into `keychain` mode prompt.

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#
```

The following example shows the creation of a key chain named `mykeychain3` in the Keychain mode and the addition of an authentication key `key10` in the same mode.

```
ZebOS(config-keychain)#key chain mykeychain3
ZebOS(config-keychain)#key 10
ZebOS(config-keychain-key)#
```

key-string

Use this command to define a password to be used by a key.

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

See Appendix A, Routing Information Protocol Authentication for information on how this command is related to the other authentication commands.

Command Syntax

```
key-string LINE
no key-string
```

Parameters

`LINE`	Specify a string of characters to be used as a password by the key.

Command Mode

Keychain-key mode

Examples

In the following example, the password for `key 1` in the key chain named `mychain` is set to `prime`:

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#key-string prime

ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#no key-string
```

maximum-prefix

Use this command to configure the maximum prefix.

Use the no parameter with this command to disable the limiting of the number of RIP routes in the routing table.

Command Syntax

```
maximum-prefix <1-65535> (<1-100>|)
no maximum-prefix
```

Parameters

<1-65535>	The maximum number of RIP routes allowed.
<1-100>	Percentage of maximum routes to generate a warning. The default threshold is 75%.

Default

None

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#maximum-prefix 150
```

neighbor

Use this command to specify a neighbor router. It is used for each connected point-to-point link. This command to exchanges non-broadcast routing information. It can be used multiple times for additional neighbors.

`Passive-interface` command disables sending routing updates on an interface. Use the `neighbor` command in conjunction with the `passive-interface` command to send routing updates to specific neighbors.

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

Command Syntax

```
neighbor A.B.C.D
no neighbor A.B.C.D
```

Parameter

`A.B.C.D`	An IP address of a neighboring router with which the routing information will be exchanged.

Default

Disabled

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#neighbor 10.7.1.12
```

network

Use this command to specify a network as one that runs RIP. This command specifies the networks to which routing updates will be sent and received. If a network is not specified, the interfaces in that network will not be advertised in any RIP update.

Use the no parameter with this command to remove the specified network as one that runs RIP.

Command Syntax

```
network A.B.C.D/M
network IFNAME
no network A.B.C.D/M
no network IFNAME
```

Parameters

A.B.C.D/M	The IP address prefix and length of this IP network.
IFNAME	Alphanumeric string that defines the interface name.

Default

Disabled

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#network 10.0.0.0/8
ZebOS(config-router)#network eth0
```

offset-list

Use this command to add an offset to in and out metrics to routes learned through RIP. This command specifies the offset value that is added to the routing metric. When the networks match the access list the offset is applied to the metrics. No change occurs if the offset value is zero.

Use the no parameter with this command to remove the offset list.

Command Syntax

```
offset-list WORD (in|out) <0-16> (IFNAME|)
no offset-list WORD (in|out) <0-16> (IFNAME|)
```

Parameters

WORD	Specify the access-list number or names to apply.
in	Indicates the access list will be used for metrics of incoming advertised routes.
out	Indicates the access list will be used for metrics of outgoing advertised routes.
<0-16>	Specify that the offset is used for metrics of networks matching the access list.
IFNAME	An alphanumeric string that specifies the interface to match.

Default

The default `offset value` is the interface metric value which is defined by the operating system.

Command Mode

Router mode

Examples

In this example the router examines the RIP updates being sent out from interface eth0 and adds 16 hops to the routes matching the ip addresses specified in the access list `accesslist1`.

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#offset-list accesslist1 in 16 eth0
```

passive-interface

Use this command to block RIP broadcast on the interface.

Use the no parameter with this command to disable this function.

Command Syntax

```
passive-interface IFNAME
no passive-interface IFNAME
```

Parameters

IFNAME	Specify the interface name.

Default

Disabled

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#passive-interface eth0
```

recv-buffer-size

Use this command to run-time configure the RIP UDP receive-buffer size.

Use the no parameter with this command to return to the default value.

Command Syntax

```
recv-buffer-size <8192-2147483647>
no recv-buffer-size (<8192-2147483647>|)
```

Parameters

`<8192-2147483647>`

Specify the RIP UDP receive buffer size value.

Default

The default value of the RIP UDP receive-buffer size is 8192.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#recv-buffer-size 150000
```

redistribute

Use this command to redistribute information from other routing protocols.

Use the no parameter with this command to disable this function.

Command Syntax

```
redistribute (kernel|connected|static|ospf|isis|bgp)
redistribute (kernel|connected|static|ospf|isis|bgp) metric <0-16>
redistribute (kernel|connected|static|ospf|isis|bgp) route-map WORD
redistribute (kernel|connected|static|ospf|isis|bgp) metric <0-16> route-map WORD
no redistribute (kernel|connected|static|ospf|isis|bgp)
no redistribute (kernel|connected|static|ospf|isis|bgp) metric <0-16>
no redistribute (kernel|connected|static|ospf|isis|bgp) route-map WORD
no redistribute (kernel|connected|static|ospf|isis|bgp) metric <0-16> route-map
  WORD
```

Parameters

bgp	Redistribute from BGP routes
connected	Redistribute from connected routes
isis	Redistribute from ISO IS-IS routes
kernel	Redistribute from kernel routes
ospf	Redistribute from OSPF routes
static	Redistribute from static routes
metric	Metric value
<0–16>	Specify a metric value
route-map	Route map reference
WORD	Specify name of the route-map

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#redistribute kernel


ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#redistribute kernel route-map myroutemap
```

restart rip graceful

Use this command to force the RIP process to restart.

After this command is executed, router immediately shuts down. NSM is notified that RIP has shutdown as Graceful and NSM preserves routes installed by RIP until the grace-period expires.

Note: This command is available only when configuration option `--enable-restart` is enabled when compiling ZebOS. Refer to the *ZebOS Network Platform Installation Guide* for more information about this configuration option.

Command Syntax

```
restart rip graceful (grace-period <1-65535>|)
```

Parameters

<1-65535>	Specify a grace period in seconds <1-65535>

Command Mode

Privileged Exec mode

Example

```
ZebOS#restart rip graceful grace-period 100
```

rip restart grace-period

Use this command to change the grace period of RIP graceful restart.

Use this command to enable the `Graceful Restart` feature on RIP daemon. If this command is configured, NSM is notified about the Grace Period. In case, RIP daemon unexpectedly shuts down, NSM sends this value to the RIP daemon when it comes up again, and the RIP daemon uses this value to end the `Graceful` state.

Use the no parameter with this command to disable this function.

Note: This command is available only when configuration option `--enable-restart` is enabled when compiling ZebOS. Refer to the *ZebOS Network Platform Installation Guide* for more information about this configuration option.

Command Syntax

```
rip restart grace-period <1-65535>
no rip restart grace-period (<1-65535>|)
```

Parameters

`<1-65535>`	Specify a grace period in seconds

Command Mode

Configure mode

Example

```
ZebOS#configure terminal
ZebOS(config)#rip restart grace-period 200
```

route

Use this command to configure static RIP routes.

Use the no parameter with this command to disable this function.

Command Syntax

```
route A.B.C.D/M
no route A.B.C.D/M
```

Parameter

A.B.C.D/M	Specify the IP address prefix and length.

Default

No route is added.

Command Mode

Router mode

Examples

Use this command to add a static RIP route. This command is used most often for debugging purposes and does not show up in the kernel routing table. After adding the RIP route, it can be checked in the RIP routing table.

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#version 1
ZebOS(config-router)#network 10.10.10.0/24
ZebOS(config-router)#network 10.10.11.0/24
ZebOS(config-router)#neighbor 10.10.10.10
ZebOS(config-router)#route 10.10.10.0/24

ZebOS(config-router)#version 1
ZebOS(config-router)#network 10.10.10.0/24
ZebOS(config-router)#network 10.10.11.0/24
ZebOS(config-router)#route 10.10.10.0/24
```

router rip

Use this global command to enable a RIP routing process.

Use the no parameter with this command to disable RIP routing.

Command Syntax

```
router rip
no router rip
```

Parameter

None

Command Mode

Configure mode

Examples

This command is used to begin the RIP routing process.

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#version 1
ZebOS(config-router)#network 10.10.10.0/24
ZebOS(config-router)#network 10.10.11.0/24
ZebOS(config-router)#neighbor 10.10.10.10
```

send-lifetime

Use this command to specify the time period during which the authentication key on a key chain can be sent.

Use the no parameter with this command to negate this command.

Command Syntax

```
send-lifetime HH:MM:SS <1-31> MONTH <1993-2035> HH:MM:SS <1-31> MONTH <1993-2035>
send-lifetime HH:MM:SS <1-31> MONTH <1993-2035> HH:MM:SS MONTH <1-31> <1993-2035>
send-lifetime HH:MM:SS MONTH <1-31> <1993-2035> HH:MM:SS <1-31> MONTH <1993-2035>
send-lifetime HH:MM:SS MONTH <1-31> <1993-2035> HH:MM:SS MONTH <1-31> <1993-2035>
send-lifetime HH:MM:SS <1-31> MONTH <1993-2035> infinite
send-lifetime HH:MM:SS MONTH <1-31> <1993-2035> infinite
send-lifetime HH:MM:SS <1-31> MONTH <1993-2035> duration <1-2147483646>
send-lifetime HH:MM:SS MONTH <1-31> <1993-2035> duration <1-2147483646>
no send-lifetime
```

Parameters

<HH:MM:SS	Specify the start time of send-lifetime in hours, minutes and seconds.
<1-31>	Specify the day of the month to start.
MONTH	Specify the month of the year to start (the first three letters of the month, for example, Jan.).
<1993-2035	Specify the year to start.
HH:MM:SS	Specify the time when send-lifetime expires in hours, minutes and seconds.
<1-31>	Specify the day of the month to expire.
MONTH	Specify the month of the year to expire (the first three letters of the month, for example, Jan.).
<1993-2035>	Specify the year to expire.
duration	Specify the duration of the key in seconds <1-2147483646>.
infinite	Specify the end time to never expire.

Command Mode

Keychain-key mode

Examples

The following example shows the setting of send-lifetime for key 1 on the key chain named mychain:

```
ZebOS#configure terminal
ZebOS(config)#key chain mychain
ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#send-lifetime 03:03:01 Jan 3 2004 04:04:02 Dec 6
2006
```

show debugging rip

Use this command to display the RIP debugging status for these debugging options: nsm debugging, RIP event debugging, RIP packet debugging and RIP nsm debugging.

Command Syntax

```
show debugging rip
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

```
ZebOS#show debugging rip
RIP debugging status:
```

show ip protocols rip

Use this command to display RIP process parameters and statistics.

Command Syntax

```
show ip protocols
show ip protocols rip
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

This is an example of the output from the `show ip protocols rip` command:

```
ZebOS#show ip protocols rip
Routing Protocol is "rip"
Sending updates every 30 seconds with +/-50%, next due in 12 seconds
Timeout after 180 seconds, garbage collect after 120 seconds
Outgoing update filter list for all interface is not set
Incoming update filter list for all interface is not set
Default redistribution metric is 1
Redistributing: connected static
Default version control: send version 2, receive version 2
Interface        Send  Recv   Key-chain
     eth0               2   2
Routing for Networks:
  10.10.0.0/24
Routing Information Sources:
  Gateway          BadPackets BadRoutes  Distance Last Update
Distance: (default is 120)
ZebOS#
```

show ip rip

Use this command to show RIP routes.

Command Syntax

```
show ip rip (database|)
```

Parameters

`database`	Specify to display information about the IP RIP database.

Command Mode

Exec mode and Privileged Exec mode

Example

The following output displays the RIP routing table with the destination network, nexthop and metric to reach it.

```
ZebOS#show ip rip
Codes: R - RIP, K - Kernel, C - Connected, S - Static, O - OSPF, I - IS-IS,
B - BGP
Network Next Hop Metric From If Time
K 0.0.0.0/0 10.0.1.1 16 eth1 01:58
C 10.0.1.0/24 1 eth1
S 10.10.10.0/24 1 eth0
C 10.10.11.0/24 1 eth0
S 192.168.101.0/24 1 eth0
R 192.192.192.0/24 1 --
```

show ip rip interface

Use this command to display information about RIP interfaces. You can specify an interface name to display information about a specific interface.

Command Syntax

```
show ip rip interface (IFNAME|)
```

Parameters

IFNAME	Name of the interface for which information is to be displayed.

Command Mode

Exec mode and Privileged Exec mode

Example

The following output displays the RIP routing table with the destination network, nexthop and metric to reach it.

```
ZebOS#show ip rip interface
lo is up, line protocol is up
RIP is not enabled on this interface
eth0 is up, line protocol is up
RIP is not enabled on this interface
eth1 is down, line protocol is down
RIP is not enabled on this interface
eth2 is up, line protocol is up
Routing Protocol: RIP
Receive RIP packets
Send RIPv1 Compatible
Passive interface: Disabled
Split horizon: Enabled with Poisoned Reversed
IP interface address:
10.10.1.1/24
10.10.2.1/24
ZebOS#
```

timers basic

Use this command to adjust routing network timers.

This command adjusts the RIP timing parameters. Every 30 seconds, an update is sent out containing the complete routing table to every neighboring router. When the time specified by the timeout parameter expires, the route is no longer valid. However, it is retained in the routing table for a short time so that neighbors are notified that the route has been dropped. When the time specified by the garbage parameter expires, the route is finally removed from the routing table. Until the garbage time expires, the route is included in all updates sent by the router.

All routers in the network must have the same timers to allow RIP to execute a distributed and asynchronous routing algorithms. The timers should not be synchronized as it might lead to unnecessary collisions on the network.

Use the no parameter with this command to restore the default routing network timers.

Command Syntax

```
timers basic <5-2147483647> <5-2147483647> <5-2147483647>
no timers basic
```

Parameters

<5-2147483647>	Specify the routing table update timer in seconds. The default is 30 seconds.
<5-2147483647>	Specify the routing information timeout timer in seconds. The default is 180 seconds. After this interval has elapsed and no updates for a route are received, the route is declared invalid.
<5-2147483647>	Specify the routing garbage collection timer in seconds. The default is 120 seconds.

Default

Enabled

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#timers basic 30 180 120

ZebOS(config)#router rip
ZebOS(config-router)#no timers basic
```

version

Use this command to specify a RIP version used globally by the router. RIP can be run in version 1 as well as version 2 mode. Version 2 has more features than version 1 including authentication. Once the rip version is set, rip packets of that version will be received and sent on all the rip-enabled interfaces.

Use the no parameter with this command to restore the default version.

Note: The `ip rip receive version` command and the `ip rip send version` command override the value set by the `version` command.

Command Syntax

```
version <1-2>
no version
```

Parameters

`<1-2>`	Specify the version of RIP processing.

Default

Version 2

Command Mode

Router mode

Examples

```
ZebOSZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#version 1
ZebOS(config-router)#network 10.10.10.0/24
ZebOS(config-router)# network 10.10.11.0/24

ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#address-family ipv4 vrf ipi
ZebOS(config-router-af)#version 2
```

CHAPTER 3 RIPng Commands

This chapter provides an alphabetized reference for each of the Routing Information Protocol next generation (RIPng) commands, which support IPv6. It includes the following commands:

aggregate-address

Use this command to set an aggregate RIPng route announcement.

Use the no parameter with this command to disable this feature.

Command Syntax

```
aggregate-address X:X::X:X/M
no aggregate-address X:X::X:X/M
```

Parameter

X:X::X:X/M	Specify an aggregate network (IPv6 address prefix and length).

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#aggregate-address 3ffe:8088::/32

ZebOS(config)#router ipv6 rip
ZebOS(config-router)#no aggregate-address 3ffe:8088::/32
```

cisco-metric-behavior

Use this command to enable or disable the metric update as Cisco.

Use the no parameter with this command to disable this feature.

Command Syntax

```
cisco-metric-behavior (enable|disable)
no cisco-metric-behavior
```

Parameters

enable	Enable updating the metric consistent with Cisco.
disable	Disable updating the metric consistent with Cisco.

Default

By default, the Cisco metric-behavior is disabled.

Command Mode

Router mode

Example

This example shows how to enable the metric update behavior to be consistent with Cisco in the Router mode.

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#cisco-metric-behavior enable
```

clear ipv6 rip route

Use this command to clear specific data from the RIPng routing table.

Command Syntax

```
clear ipv6 rip route (X:X::X:X/M|rip|kernel|connected|static|ospf6|isis|bgp|all)
```

Parameters

`X:X::X:X/M`	Removes entries which exactly match this destination address from the RIPng routing table.
`bgp`	Removes only BGP routes from the RIP routing table.
`connected`	Removes entries for connected routes from the RIP routing table.
`isis`	Removes only IS-IS routes from the RIP routing table
`kernel`	Removes kernel entries from the RIP routing table.
`ospf`	Removes only OSPF routes from the RIP routing table.
`static`	Removes static entries from the RIP routing table.
`all`	Removes the entire RIP routing table.

Command Mode

Privileged Exec mode

Example

```
ZebOS#clear ipv6 rip route isis
ZebOS#clear ipv6 rip route 3ffe:ffff::/16
```

debug ipv6 rip

Use this command to specify the options for the displayed debugging information for RIPng events, RIPng packets and RIPng NSM communications.

Use the no option with this command to turn off debugging options for RIPng. The undebug alias command can also be used.

Command Syntax

```
debug ipv6 rip (all|)
debug ipv6 rip events
debug ipv6 rip nsm
debug ipv6 rip packet (recv|send|) (detail|)
no ipv6 debug rip (all|)
no debug ipv6 rip events
no ipv6 debug rip nsm
no debug ipv6 rip packet (recv|send|) (detail|)
undebug ipv6 rip (all|)
undebug ipv6 rip events
undebug ipv6 rip nsm
undebug ipv6 debug rip packet (recv|send|) (detail|)
```

Parameters

`all`	Debug all RIP information.
`events`	Debug RIP events.
`nsm`	Debug RIP and NSM communications.
`packet`	Debug RIP packets, only Routing Information Protocol
`recv`	Debug received packets.
`send`	Debug sent packets.
`detail`	Display detailed information for the sent or received packet.

Default

Disabled

Command Mode

Privileged Exec mode and Configure mode

Examples

```
ZebOS#debug ipv6 rip events
ZebOS#debug ipv6 rip packet send detail
ZebOS#debug ipv6 rip nsm
```

default-information originate

Use this command to generate a default route into the RIPng.

Use the no parameter with this command to disable this feature.

Command Syntax

```
default-information originate
no default-information originate
```

Parameters

None

Default

Disabled

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#default-information originate
```

default-metric

Use this command to specify the metrics to be assigned to redistributed routes.

Use the no parameter with this command to disable this feature.

For more details about this command, see the IPv4 version of this command (default-metric).

Command Syntax

```
default-metric <1-16>
no default-metric (<1-16>|)
```

Parameter

<1-16>	Specify the default metric.

Default

By default, the metric value is set to 1.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#default-metric 8
```

distance

Use this command to set the administrative distance for RIP.

Use the no option with this command to disable this function.

For more details about this command, see the IPv4 version of this command (distance).

Command Syntax

```
distance <1-255>
no distance (<1-255>|)
```

Parameter

<1-255>	Specify the administrative distance value.

Default

By default, the administrative distance is 120.

Command Mode

Router mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#distance 100
```

distribute-list

Use this command to filter incoming or outgoing route updates using the access-list or the prefix-list. You can filter out incoming or outgoing route updates using access-list or prefix-list. If you do not specify the name of the interface, the filter will be applied to all the interfaces.

Use the no parameter with this command to disable this feature.

Command Syntax

```
distribute-list WORD (in|out) (IFNAME|)
distribute-list prefix WORD (in|out) (IFNAME|)
no distribute-list WORD (in|out) (IFNAME|)
no distribute-list prefix WORD (in|out) (IFNAME|)
```

Parameters

WORD	Specify the IPv6 access-list number or name to use.
prefix	Filter prefixes in routing updates.
WORD	Specify the name of the IPv6 prefix-list to use.
in	Filter incoming routing updates.
out	Filter outgoing routing updates.
IFNAME	Specify the name of the interface on which distribute-list applies.

Default

Disabled

Command Mode

Router mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#distribute-list prefix myfilter in eth0
```

ipv6 rip metric-offset

Use this command to set RIP metric offset.

Use the no parameter with this command to disable this function.

Command Syntax

```
ipv6 rip metric-offset <1-16>
no ipv6 rip metric-offset <1-16>
```

Parameter

<1-16>	Set a metric value

Default

None

Command Mode

Interface mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#ipv6 rip metric-offset 1

ZebOS(config)#interface eth0
ZebOS(config-if)#no ipv6 rip metric-offset 1
```

ipv6 rip split-horizon

Use this command to perform the split-horizon action on the interface.

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

For more details about this command, see the IPv4 version of this command (ip rip split-horizon).

Command Syntax

```
ipv6 rip split-horizon
ipv6 rip split-horizon poisoned
no ipv6 rip split-horizon
```

Parameter

`poisoned`	Performs split-horizon with poisoned reverse.

Default

Split horizon poisoned

Command Mode

Interface mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#interface eth1
ZebOS(config-if)#ipv6 rip split-horizon

ZebOS(config)#interface eth1
ZebOS(config-if)#no ipv6 rip split-horizon
```

ipv6 router rip

Use this command to enable RIPng routing on the interface.

Use the no parameter with this command to disable RIPng routing.

Command Syntax

```
ipv6 router rip
no ipv6 router rip
```

Parameters

None

Default

None

Command Mode

Interface mode

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#ipv6 router rip
```

neighbor

Use this command to specify a neighbor router.

Use the no parameter with this command to disable the specific router.

For more details about this command, see the IPv4 version of this command (neighbor).

Command Syntax

```
neighbor X:X::X:X IFNAME
no neighbor X:X::X:X IFNAME
```

Parameters

X:X::X:X	Specify a link-local IP address of a neighboring router with which the routing information is exchanged.
IFNAME	Specify the name of the interface.

Default

Disabled

Command Mode

Router mode

Example

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#neighbor 80::1 eth0
```

offset-list

Use this command to add an offset to in and out metrics to routes learned through RIPng.

Use the no parameter with this command to remove this function.

For more details about this command, see the IPv4 version of this command (offset-list).

Command Syntax

```
offset-list WORD (in|out) <0-16> (IFNAME|)
no offset-list (WORD) in|out <0-16> (IFNAME|)
```

Parameters

WORD	Specify the access-list number or names to apply.
in	Indicates the access list will be used for metrics of incoming advertised routes.
out	Indicates the access list will be used for metrics of outgoing advertised routes.
<0-16>	Specify that the offset is used for metrics of networks matching the access list.
IFNAME	An alphanumeric string that specifies the interface to match.

Default

The default offset value is the metric value of the interface which is defined by the operating system.

Command Mode

Router mode

Examples

In this example the router examines the RIP updates being sent out from interface eth0 and adds 16 hops to the routes matching the ip addresses specified in the access list `accesslist1`.

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#offset-list accesslist1 in 16 eth0
```

passive-interface

Use this command to suppress routing updates on an interface.

Use the no parameter with this command to disable this function.

Command Syntax

```
passive-interface IFNAME
no passive-interface IFNAME
```

Parameters

IFNAME	Specify the interface name.

Default

Disabled

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#passive-interface eth0
```

recv-buffer-size

Use this command to run-time configure the RIPng UDP receive-buffer size.

Use the no parameter with this command to return to the default value.

Command Syntax

```
recv-buffer-size <8192-2147483647>
no recv-buffer-size (<8192-2147483647>|)
```

Parameters

`<8192-2147483647>`

Specify the RIP UDP receive buffer size value.

Default

The default value of the RIP UDP receive-buffer size is 8192.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#recv-buffer-size 150000
```

redistribute

Use this command to redistribute information from other routing protocols.

Use the no parameter with this command to disable this function.

Command Syntax

```
redistribute (kernel|connected|static|ospf6|isis|bgp)
redistribute (kernel|connected|static|ospf6|isis|bgp) metric <0-16>
redistribute (kernel|connected|static|ospf6|isis|bgp) route-map WORD
redistribute (kernel|connected|static|ospf6|isis|bgp) metric <0-16> route-map WORD
no redistribute (kernel|connected|static|ospf6|isis|bgp)
no redistribute (kernel|connected|static|ospf6|isis|bgp) metric <0-16>
no redistribute (kernel|connected|static|ospf6|isis|bgp) route-map WORD
no redistribute (kernel|connected|static|ospf6|isis|bgp) metric <0-16> route-map
  WORD
```

Parameters

bgp	Redistribute from BGP routes
connected	Redistribute from connected routes
isis	Redistribute from ISO IS-IS routes
kernel	Redistribute from kernel routes
ospf6	Redistribute from OSPF routes (version 3)
static	Redistribute from static routes
metric	Metric value
<0–16>	Specify a metric value
route-map	Route map reference
WORD	Specify name of the route-map

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#redistribute kernel route-map mymap
ZebOS(config-router)#redistribute kernel metric 8
```

route

Use this command to debug the specified route advertisement. Use this command to configure static RIPng routes.

Use the no parameter with this command to disable this function.

Command Syntax

```
route X:X::X:X/M
no route X:X::X:X/M
```

Parameter

X:X::X:X/M	Specify the IPv6 address prefix and length.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#route 3ffe:1234:5678::1/64
```

route-map

Use this command to set a route map for input or output filtering on a specified interface.

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

Command Syntax

```
route-map WORD (in|out) IFNAME
no route-map WORD (in|out) IFNAME
```

Parameters

`WORD`	Specify a route map name
`in`	Specify to set the route map for input filtering
`out`	Specify to set the route map for output filtering
`IFNAME`	Specify an interface name to which to associate the route map

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#route-map IPIroutemap10 in eth1
```

router ipv6 rip

Use this global command to enable a RIPng routing process.

Use the no parameter with this command to disable the RIPng routing process.

Command Syntax

```
router ipv6 rip
no router ipv6 rip
```

Parameters

None

Command Mode

Configure mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#
```

show debugging ipv6 rip

Use this command to display the RIPng debugging status for RIPng NSM, RIPng events, and RIPng packets.

Command Syntax

```
show debugging ipv6 rip
```

Parameters

None

Command Mode

Exec Mode and Privileged Exec Mode

Example

```
ZebOS#show debugging ipv6 rip
 RIPng packet debugging is on
```

show ipv6 protocols rip

Use this command to display RIPng process parameters and statistics.

Command Syntax

```
show ipv6 protocols rip
```

Parameters

None

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show ipv6 protocols rip` command.

```
ZebOS#show ipv6 protocols rip
Routing Protocol is "ripng"
  Sending updates every 30 seconds with +/-50%, next due in 10 seconds
  Timeout after 180 seconds, garbage collect after 120 seconds
  Outgoing update filter list for all interface is not set
  Incoming update filter list for all interface is not set
  Default redistribute metric is 1
  Redistributing: connected
  Routing for Networks:
    3ffe:1::/64
ZebOS#
```

show ipv6 rip

Use this command to show RIP routes.

Command Syntax

```
show ipv6 rip (database|)
```

Parameters

`database`	Specify to display information about the IPv6 RIP database.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the show ipv6 rip database command.

```
ZebOS#show ipv6 rip database
Codes: R - RIP, K - Kernel, C - Connected, S - Static, O - OSPF, I - IS-IS,
B - BGP, a - aggregate, s - suppressed
Network Next Hop If Met Tag Time
R 3ffe:1234:5678::/64 fe80::3 eth1 3 0 02:28
C 3ffe:ffff:1::/64 :: eth0 1 0
Ra 3ffe:ffff:2::/48 -- 1 0
Rs 3ffe:ffff:2::/48 fe80::3 eth1 3 0 02:32
Cs 3ffe:ffff:2::/64 :: eth1 1 0
R 3ffe:ffff:ffff:ffff::/64 fe80::3 eth1 3 0 02:28
```

show ipv6 rip interface

Use this command to display information about the RIPng interfaces. You can specify an interface name to display information about a specific interface.

Command Syntax

```
show ipv6 rip interface (IFNAME|)
```

Parameters

IFNAME	Name of the interface for which information is to be displayed.

Command Mode

Exec mode and Privileged Exec mode

Example

The following is a sample output from the `show ipv6 rip interface` command.

```
ZebOS#show ipv6 rip interface
lo is up, line protocol is up
RIPng is not enabled on this interface
eth0 is up, line protocol is up
RIPng is not enabled on this interface
eth1 is down, line protocol is down
RIPng is not enabled on this interface
eth2 is up, line protocol is up
Routing Protocol: RIPng
Passive interface: Disabled
Split horizon: Enabled with Poisoned Reversed
IP interface address:
3ffe:ffff::1/64
3ffe:fffe::1/64
```

timers basic

Use this command to adjust routing network timers.

Use the no parameter with this command to restore the defaults.

For more details about this command, see the IPv4 version of this command (timers basic).

Command Syntax

```
timers basic <5-2147483647> <5-2147483647> <5-2147483647>
no timers basic
```

Parameters

<5-2147483647>	Specify the routing table update timer in seconds. The default is 30 seconds.
<5-2147483647>	Specify the routing information timeout timer in seconds. The default is 180 seconds. After this interval has elapsed and no updates for a route are received, the route is declared invalid.
<5-2147483647>	Specify the routing garbage collection timer in seconds. The default is 120 seconds.

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#timers basic 30 180 120

ZebOS(config)#router ipv6 rip
ZebOS(config-router)#no timers basic
```

Appendix A Routing Information Protocol Authentication

To support RIPv2 message authentication, the ZebOS implementation provides the choice of `plain text` or `MD5` authentication, and the option for single key or multiple keys in different modes and stages.

Single Key Authentication

Use the following steps to configure route to enable RIPv2 authentication using a single key or password:

1. Define the authentication string or password

   In the Interface mode, specify the authentication string or password used by the key using the following command:

   ```
   ip rip authentication string LINE
   ```

   where `LINE` is the authentication string or password

2. Specify mode of authentication for the interface

   In the Interface mode, specify either text or MD5 authentication using the following command:

   ```
   ip rip authentication mode md5|text
   ```

Example

```
ZebOS#configure terminal
ZebOS(config)#interface eth0
ZebOS(config-if)#ip rip authentication string mykey
ZebOS(config-if)#ip rip authentication mode md5
```

Multiple Keys Authentication

Use the following steps to configure route to enable RIPv2 authentication using multiple keys at different times:

1. Define a key chain

   In the Configure mode, identify a key chain with a key chain name using the following command:

   ```
   key chain KEYNAME
   ```

   where `KEYNAME` is the name of the chain to manage.

2. Define the key(s)

   In the Keychain mode, specify a key on this key chain using the following command:

   ```
   key KEYID
   ```

   where `KEYID = <1-2147483647>` Key Identifier number

3. Define the authentication string or password

   In the Keychain-key mode, define the password used by a key, using the following command:

   ```
   key-string LINE
   ```

   where `LINE` is a string of characters to be used as a password by the key.

4. Set key management options

This step can be performed at this stage or later when multiple keys are used. The options are configured in the `keychain-key` command mode.

- Set the time period during which the authentication key on a key chain is received as valid, using the following command:

```
accept-lifetime START END
```

where `START` and `END` are the beginning and end of the time period.

- Set the time period during which the authentication key on a key chain can be sent using the following command:

```
send-lifetime START END
```

where `START` and `END` are the beginning and end of the time period.

5. Enable authentication on an interface

   In the Interface mode, enable authentication on an interface and specify the key chain to be used, using the following command:

```
ip rip authentication key-chain CHAINNAME
```

   where `CHAINNAME` is a set of valid authentication keys

6. Specify mode of authentication for the interface

   In the Interface mode, specify either text or MD5 authentication using the following command:

```
ip rip authentication mode md5|text
```

Example

In the following example, a password `toyota` is set for a `key 1` in a key chain `cars`. On Interface `eth0` authentication is enabled and the authentication mode is set as `MD5`.

```
ZebOS#configure terminal
ZebOS(config)#key chain cars
ZebOS(config-keychain)#key 1
ZebOS(config-keychain-key)#keystring toyota
ZebOS(config-keychain-key)#accept-lifetime 10:00:00 Oct 08 2002 duration 43200
ZebOS(config-keychain-key)#send-lifetime 10:00:00 Oct 8 2002 duration 43200
ZebOS(config-keychain-key)#exit
ZebOS(config-keychain)#exit
ZebOS(config)#interface eth0
ZebOS(config-if)#ip rip authentication key-chain cars
ZebOS(config-if)#ip rip authentication mode md5
ZebOS(config-if)#exit
```

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