Citrix® NetScaler® Routing
RIP and RIPng Command Reference
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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 Command Line Interface Environment

ZebOS> 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.

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   ip
  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
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 authentication-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.

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monospaced</td>
<td>Command strings entered on a command line</td>
<td>show ip ospf</td>
</tr>
<tr>
<td>font</td>
<td></td>
<td></td>
</tr>
<tr>
<td>lowercase</td>
<td>Keywords that you enter exactly as shown in the command syntax.</td>
<td>show ip ospf</td>
</tr>
<tr>
<td>UPPER CASE</td>
<td>See Variable Placeholders</td>
<td>IFNAME</td>
</tr>
<tr>
<td>()</td>
<td>Optional parameters, from which you must select one. Vertical bars delimit</td>
<td>(A.B.C.D&lt;0-4294967295&gt;)</td>
</tr>
<tr>
<td></td>
<td>the selections. Do not enter the parentheses or vertical bars as part of the</td>
<td></td>
</tr>
<tr>
<td></td>
<td>command.</td>
<td></td>
</tr>
<tr>
<td>()</td>
<td>Optional parameters, from which you select one or none. Vertical bars</td>
<td>(A.B.C.D&lt;0-4294967295&gt;</td>
</tr>
<tr>
<td></td>
<td>delimit the selections. Do not enter the parentheses or vertical bars as part</td>
<td></td>
</tr>
<tr>
<td></td>
<td>of the command.</td>
<td></td>
</tr>
<tr>
<td>()</td>
<td>Optional parameter which you can specify or omit. Do not enter the</td>
<td>(IFNAME</td>
</tr>
<tr>
<td></td>
<td>parentheses or vertical bar as part of the command.</td>
<td></td>
</tr>
<tr>
<td>{}</td>
<td>Optional parameters, from which you must select one or more. Vertical</td>
<td>{intra-area &lt;1-255&gt;</td>
</tr>
<tr>
<td></td>
<td>bars delimit the selections. Do not enter the braces or vertical bars as</td>
<td></td>
</tr>
<tr>
<td></td>
<td>part of the command.</td>
<td></td>
</tr>
<tr>
<td>[]</td>
<td>Optional parameters, from which you select zero or more. Vertical bars</td>
<td>[&lt;1-65535&gt;</td>
</tr>
<tr>
<td></td>
<td>delimit the selections. Do not enter the brackets or vertical bars as</td>
<td></td>
</tr>
<tr>
<td></td>
<td>part of the command.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>A '?’ before a parameter in square brackets limits that parameter to one</td>
<td></td>
</tr>
<tr>
<td></td>
<td>occurrence in a command string.</td>
<td></td>
</tr>
<tr>
<td>.</td>
<td>Repeatable parameter. The parameter that follows a period can be</td>
<td>set as-path prepend .&lt;1-65535&gt;</td>
</tr>
<tr>
<td></td>
<td>repeated more than once. Do not enter the period as part of the command.</td>
<td></td>
</tr>
</tbody>
</table>
### Variable Placeholders

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

<table>
<thead>
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<th>Token</th>
<th>Description</th>
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<td>WORD</td>
<td>A contiguous text string (excluding spaces), such as IFNAME for the name of an interface</td>
</tr>
<tr>
<td>LINE</td>
<td>A text string, including spaces; no other parameters can follow this parameter</td>
</tr>
<tr>
<td>A.B.C.D</td>
<td>IPv4 address</td>
</tr>
<tr>
<td>A.B.C.D/M</td>
<td>IPv4 address and mask/prefix</td>
</tr>
<tr>
<td>X:X::X:X</td>
<td>IPv6 address</td>
</tr>
<tr>
<td>X:X::X:X/M</td>
<td>IPv6 address and mask/prefix</td>
</tr>
<tr>
<td>HH:MM:SS</td>
<td>Time format</td>
</tr>
<tr>
<td>AA:NN</td>
<td>BGP community value</td>
</tr>
<tr>
<td>XX:XX:XX:XX:XX</td>
<td>MAC address</td>
</tr>
<tr>
<td>&lt;1-5&gt;</td>
<td>Numeric range</td>
</tr>
<tr>
<td>&lt;1-65535&gt;</td>
<td></td>
</tr>
<tr>
<td>&lt;0-2147483647&gt;</td>
<td></td>
</tr>
<tr>
<td>&lt;0-4294967295&gt;</td>
<td></td>
</tr>
</tbody>
</table>

### Command Description Format

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

<table>
<thead>
<tr>
<th>Section</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Command Name</td>
<td>The command, what the command does, and when should it be used</td>
</tr>
<tr>
<td>Command Syntax</td>
<td>The syntax of the command</td>
</tr>
<tr>
<td>Parameters</td>
<td>Parameters and options for the command</td>
</tr>
<tr>
<td>Default</td>
<td>The status before the command is executed</td>
</tr>
<tr>
<td>Command Mode</td>
<td>The name of the mode in which this command is used. Examples include Exec or Configure modes.</td>
</tr>
<tr>
<td>Example</td>
<td>An example of the command being executed</td>
</tr>
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</table>
Keyboard Operations

You can perform these operations from the keyboard:

<table>
<thead>
<tr>
<th>Key combination</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Left arrow or Ctrl+b</td>
<td>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.</td>
</tr>
<tr>
<td>Right arrow or Ctrl-f</td>
<td>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.</td>
</tr>
<tr>
<td>Esc, b</td>
<td>Moves back one word</td>
</tr>
<tr>
<td>Esc, f</td>
<td>Moves forward one word</td>
</tr>
<tr>
<td>Ctrl+e</td>
<td>Moves to end of the line</td>
</tr>
<tr>
<td>Ctrl+a</td>
<td>Moves to the beginning of the line</td>
</tr>
<tr>
<td>Ctrl+u</td>
<td>Deletes the line</td>
</tr>
<tr>
<td>Ctrl+w</td>
<td>Deletes from the cursor to the previous whitespace</td>
</tr>
<tr>
<td>Alt+d</td>
<td>Deletes from the cursor to the end of line</td>
</tr>
<tr>
<td>Ctrl+k</td>
<td>Deletes text previously deleted with Ctrl+k, Alt+d, Ctrl+w, or Ctrl+u at the cursor</td>
</tr>
<tr>
<td>Ctrl+y</td>
<td>Pastes text previously deleted with Ctrl+k, Alt+d, Ctrl+w, or Ctrl+u at the cursor</td>
</tr>
<tr>
<td>Ctrl+t</td>
<td>Transposes the current character with the previous character</td>
</tr>
<tr>
<td>Ctrl+c</td>
<td>Ignores the current line and redispalyes the command prompt</td>
</tr>
<tr>
<td>Ctrl+z</td>
<td>Ends configuration mode and returns to exec mode</td>
</tr>
<tr>
<td>Ctrl+l</td>
<td>Clears the screen</td>
</tr>
<tr>
<td>Up Arrow or Ctrl+p</td>
<td>Scroll backward through command history</td>
</tr>
<tr>
<td>Down Arrow or Ctrl+n</td>
<td>Scroll forward through command history</td>
</tr>
</tbody>
</table>

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 example includes all lines with “input” or “output”:

```
ZebOS# show interface 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.

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Mode</td>
<td>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.</td>
</tr>
<tr>
<td>Privileged Executive Mode</td>
<td>Also called the enable mode, in this mode you can run additional basic commands such as debug, write, and show.</td>
</tr>
<tr>
<td>Configure Mode</td>
<td>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.</td>
</tr>
<tr>
<td>Interface Mode</td>
<td>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.</td>
</tr>
<tr>
<td>Router Mode</td>
<td>This mode is used to configure router-specific settings for a protocol such as RIP or OSPF.</td>
</tr>
</tbody>
</table>
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.
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
- cisco-metric-behavior
- clear ip rip route
- debug rip
- default-information originate
- default-metric
- distance
- distribute-list
- ip rip authentication key-chain
- ip rip authentication mode
- ip rip authentication string
- ip rip receive-packet
- ip rip receive version
- ip rip send-packet
- ip rip send version
- ip rip split-horizon
- key
- key chain
- key-string
- maximum-prefix
- neighbor
- network
- offset-list
- passive-interface
- recv-buffer-size
- redistribute
- restart rip graceful
- rip restart grace-period
- route
- router rip
- send-lifetime
Routing Information Protocol Commands

- show debugging rip
- show ip protocols rip
- show ip rip
- show ip rip interface
- timers basic
- version
**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**

```plaintext
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> infinite
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> infinite
accept-lifetime HH:MM:SS <1-31> MONTH <1993-2035> duration <1-2147483646>
accept-lifetime HH:MM:SS <1-31> MONTH <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** Enables updating the metric consistent with Cisco.
- **disable** Disables 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**

```plaintext
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.

```plaintext
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
Routing Information Protocol Commands

**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 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**

```plaintext
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**

<table>
<thead>
<tr>
<th>IFNAME</th>
<th>Specify the interface name.</th>
</tr>
</thead>
</table>

**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 10.10.0.0/24
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> 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

ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#version 1
ZebOS(config-router)#network 10.10.0.0/24
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
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
- cisco-metric-behavior
- clear ipv6 rip route
- debug ipv6 rip
- default-information originate
- default-metric
- distance
- distribute-list
- ipv6 rip metric-offset
- ipv6 rip split-horizon
- ipv6 router rip
- neighbor
- offset-list
- passive-interface
- recv-buffer-size
- redistribute
- route
- route-map
- router ipv6 rip
- show debugging ipv6 rip
- show ipv6 protocols rip
- show ipv6 rip
- show ipv6 rip interface
- timers basic
**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/M|rip|kernel|connected|static|ospf6|isis|bgp|all)
```

**Parameters**

- **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**

```plaintext
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**

```plaintext
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(config)#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(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(config-router)#route 3ffe:1234:5678::1/64
```

---

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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

<table>
<thead>
<tr>
<th>WORD</th>
<th>Specify a route map name</th>
</tr>
</thead>
<tbody>
<tr>
<td>in</td>
<td>Specify to set the route map for input filtering</td>
</tr>
<tr>
<td>out</td>
<td>Specify to set the route map for output filtering</td>
</tr>
<tr>
<td>IFNAME</td>
<td>Specify an interface name to which to associate the route map</td>
</tr>
</tbody>
</table>

Command Mode

Router mode

Examples

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#route-map IPIrouteemap10 in eth1
```
**router ipv6 rip**

Use this global command to enable a RIPv6 routing process.

Use the `no` parameter with this command to disable the RIPv6 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
```
CHAPTER 4  Routing Information Protocol VPN Commands

This chapter provides information about RIP VPN commands. These commands are available when the RIP Provider Edge (PE) and Customer Edge (CE) feature is supported. Using these commands, VPN customers can use RIP to receive information, which the CE-router places into the connected Virtual Routing and Forwarding (VRF) from the receiving interface. The information is then advertised across the MPLS/VPN backbone between PE-routers.

To provide a VPN service, the PE-router needs to be configured so that any routing information learned from a VPN customer interface can be associated with a particular VRF. This is achieved using any standard routing protocol process (RIP, OSPF, BGP or static routes etc).

The RIP VPN commands are available only if the --enable-pece-rip configure option is enabled when compiling ZebOS. For detailed information on all configuration options, refer to the ZebOS Network Platform Installation Guide.

To enable the RIP PE-CE feature, an Address Family sub-mode is added within the main RIP configuration. Most of the RIP commands that are available from Router and Interface mode are also available from the Address Family mode. Refer to the “RIP Commands” chapter for details on these commands. Additionally, all RIP debug commands display additional VRF information when the RIP PE-CE feature is supported.

This chapter contains the following commands:

- address-family ipv4 vrf
- address-family ipv6 vrf
- exit-address-family
- show ip rip interface vrf
- show ip rip vrf
- show ip vrf
**address-family ipv4 vrf**

Use this command to enable the exchanging of VRF routing information and to enter the Address Family mode. This command configures the routing exchange between PE and CE devices. Configure a RIP address family for each VRF configured on the PE router.

To use this command, you must first create a VRF-Name in the NSM using the `ip vrf` command. Associate the same name with the RIP process using this command.

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

**Command Syntax**

```
address-family ipv4 vrf NAME
no address-family ipv4 vrf NAME
```

**Parameters**

- **NAME**
  - Specify the name for the VRF instance

**Command Mode**

Router mode

**Examples**

The following example places the router in Address Family mode and specifies VRF1 as the name of the VRF instance to associate with subsequent IP Version 4 Address Family mode commands:

```
ZebOS#configure terminal
ZebOS(config)#router rip
ZebOS(config-router)#address-family ipv4 vrf VRF1
ZebOS(config-router-af)#
```
**address-family ipv6 vrf**

Use this command to enable the exchanging of VRF routing information and to enter the Address Family mode. This command configures the routing exchange between PE and CE devices. Configure a RIP address family for each VRF configured on the PE router.

To use this command, you must first create a VRF-Name in the NSM using the `ip vrf` command. Associate the same name with the RIP process using this command.

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

**Command Syntax**

```
address-family ipv6 vrf NAME
no address-family ipv6 vrf NAME
```

**Parameters**

- **NAME** Specify the name for the VRF instance.

**Command Mode**

Router mode

**Examples**

The following example places the router in Address Family mode and specifies VRF1 as the name of the VRF instance to associate with subsequent IP Version 6 Address Family mode commands:

```
ZebOS#configure terminal
ZebOS(config)#router ipv6 rip
ZebOS(config-router)#address-family ipv6 vrf VRF1
ZebOS(config-router-af)#
```
**exit-address-family**

Use this command to exit the Address Family mode. This command is supported in RIP and RIPng (IPv4 and IPv6).

**Command Syntax**

```
exit-address-family
```

**Parameters**

None

**Command Mode**

Address Family mode

**Examples**

The following examples show the change in prompt after using the `exit-address-family` command to exit the Address Family mode.

```
ZebOS(config)#router rip
ZebOS(config-router)#address-family ipv4 vrf IPI
ZebOS(config-router-af)#exit-address-family
ZebOS(config-router)#

ZebOS(config)#router ipv6 rip
ZebOS(config-router)#address-family ipv6 vrf VRF1
ZebOS(config-router-af)#exit-address-family
ZebOS(config-router)#
```
**show ip rip interface vrf**

Use this command to display VRF information. This command is supported in RIP and RIPng (IPv4 and IPv6).

**Command Syntax**

```
show ip rip interface vrf WORD (IFNAME)
```

**Parameters**

- **WORD**
  - Specify the name for the VRF instance.
- **IFNAME**
  - Specify name for the interface.

**Command Mode**

Exec mode and Privileged Exec mode

**Example**

```
ZebOS#show ip rip interface vrf IPI

eth1 is up, line protocol is up
Routing Protocol: RIP
  VPN Routing/Forwarding: IPI
  Receive RIP packets
  Send RIP packets
  Passive interface: Disabled
  Split horizon: Enabled with Poisoned Reversed
  IP interface address:
    1.1.1.92/24

eth3 is up, line protocol is up
  RIP is not enabled on this interface
```
**show ip rip vrf**

Use this command to display VRF information. This command is supported in RIP and RIPng (IPv4 and IPv6).

**Command Syntax**

```
show ip rip (database) vrf WORD
```

**Parameters**

- **database**: Specify to display information about the IP RIP database.
- **WORD**: Specify the name for the VRF instance.

**Command Mode**

Privileged Exec mode and Exec mode

**Examples**

```
ZebOS#show ip rip database vrf IPI
Codes: R - RIP, Rc - RIP connected, Rs - RIP static, K - Kernel, C - Connected, S - Static, O - OSPF, I - IS-IS, B - BGP

Network            Next Hop         Metric From     If     Time
Rc 1.1.1.0/24                               1                 eth1
S  72.72.75.0/24      98.98.8.2             1                 eth3
```
show ip vrf

Use this command to display VRF information. This command is supported in RIP and RIPng (IPv4 and IPv6).

Command Syntax

    show ip vrf
    show ip vrf WORD

Parameters

    WORD  Specify the name for the VRF instance.

Command Mode

Exec mode and Privileged Exec mode

Example

    ZebOS#show ip vrf IPI

    VRF IPI, FIB ID 1
    Router ID: 1.1.1.2 (config)
    Interfaces:
        eth1
        eth3
    VRF IPI; (id=1); RIP enabled Interfaces:
        eth1
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
Routing Information Protocol Authentication

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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