



# Configuring RIP

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## Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at <https://tools.cisco.com/bugsearch/> and the release notes for your software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the "New and Changed Information" chapter or the Feature History table in this chapter.

## Information About RIP

RIP uses User Datagram Protocol (UDP) data packets to exchange routing information in small internetworks. RIPv2 supports IPv4. RIPv2 uses an optional authentication feature supported by the RIPv2 protocol.



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**Note** Cisco NX-OS does not support IPv6 for RIP.

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RIP uses the following two message types:

- Request—Sent to the multicast address 224.0.0.9 to request route updates from other RIP-enabled routers.
- Response—Sent every 30 seconds by default. The router also sends response messages after it receives a request message. The response message contains the entire RIP route table. RIP sends multiple response packets for a request if the RIP routing table cannot fit in one response packet.

RIP uses a hop count for the routing metric. The hop count is the number of routers that a packet can traverse before reaching its destination. A directly connected network has a metric of 1; an unreachable network has a metric of 16. This small range of metrics makes RIP an unsuitable routing protocol for large networks.

## RIPv2 Authentication

You can configure authentication on RIP messages to prevent unauthorized or invalid routing updates in your network. Cisco NX-OS supports a simple password or an MD5 authentication digest.

You can configure the RIP authentication per interface by using key-chain management for the authentication keys. Key-chain management allows you to control changes to the authentication keys used by an MD5 authentication digest or simple text password authentication. See the *Cisco Nexus 7000 Series NX-OS Security Configuration Guide*, for more details about creating key-chains.

To use an MD5 authentication digest, you configure a password that is shared at the local router and all remote RIP neighbors. Cisco NX-OS creates an MD5 one-way message digest based on the message itself and the encrypted password and sends this digest with the RIP message (Request or Response). The receiving RIP neighbor validates the digest by using the same encrypted password. If the message has not changed, the calculation is identical and the RIP message is considered valid.

An MD5 authentication digest also includes a sequence number with each RIP message to ensure that no message is replayed in the network.

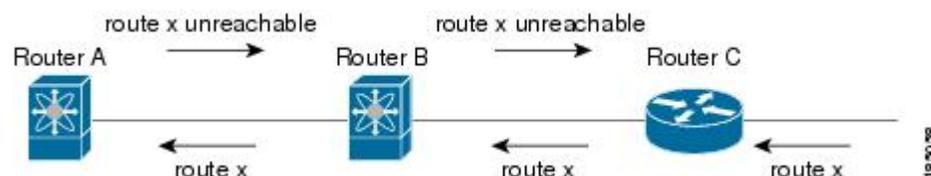
## Split Horizon

You can use split horizon to ensure that RIP never advertises a route out of the interface where it was learned.

Split horizon is a method that controls the sending of RIP update and query packets. When you enable split horizon on an interface, Cisco NX-OS does not send update packets for destinations that were learned from this interface. Controlling update packets in this manner reduces the possibility of routing loops.

You can use split horizon with poison reverse to configure an interface to advertise routes learned by RIP as unreachable over the interface that learned the routes.

**Figure 1: Sample RIP Network with Split Horizon Poison Reverse Enabled**



Router C learns about route X and advertises that route to Router B. Router B in turn advertises route X to Router A, but sends a route X unreachable update back to Router C.

By default, split horizon is enabled on all interfaces.

## Route Filtering

You can configure a route policy on a RIP-enabled interface to filter the RIP updates. Cisco NX-OS updates the route table with only those routes that the route policy allows.

## Route Summarization

You can configure multiple summary aggregate addresses for a specified interface. Route summarization simplifies route tables by replacing a number of more-specific addresses with an address that represents all the specific addresses. For example, you can replace 10.1.1.0/24, 10.1.2.0/24, and 10.1.3.0/24 with one summary address, 10.1.0.0/16.

If more specific routes are in the routing table, RIP advertises the summary address from the interface with a metric equal to the maximum metric of the more specific routes.



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**Note** Cisco NX-OS does not support automatic route summarization.

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## Route Redistribution

You can use RIP to redistribute static routes or routes from other protocols. You must configure a route map with the redistribution to control which routes are passed into RIP. A route policy allows you to filter routes based on attributes such as the destination, origination protocol, route type, route tag, and so on. For more information, see [Configuring Route Policy Manager](#).

Whenever you redistribute routes into a RIP routing domain, Cisco NX-OS does not, by default, redistribute the default route into the RIP routing domain. You can generate a default route into RIP, which can be controlled by a route policy.

You also configure the default metric that is used for all imported routes into RIP.

## Load Balancing

You can use load balancing to allow a router to distribute traffic over all the router network ports that are the same distance from the destination address. Load balancing increases the usage of network segments and increases effective network bandwidth.

Cisco NX-OS supports the Equal Cost Multiple Paths (ECMP) feature with up to 16 equal-cost paths in the RIP route table and the unicast RIB. You can configure RIP to load balance traffic across some or all of those paths.

## High Availability for RIP

Cisco NX-OS supports stateless restarts for RIP. After a reboot or supervisor switchover, Cisco NX-OS applies the running configuration and RIP immediately sends request packets to repopulate its routing table.

## Virtualization Support

Cisco NX-OS supports multiple instances of the RIP protocol that run on the same system. RIP supports virtual routing and forwarding (VRF) instances. VRFs exist within virtual device contexts (VDCs).

You can configure up to four RIP instances on a VDC. By default, Cisco NX-OS places you in the default VDC and default VRF unless you specifically configure another VDC and VRF.

See the *Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide*.

## Licensing Requirements for RIP

This feature does not require a license. Any feature not included in a license package is bundled with the Cisco NX-OS system images and is provided at no extra charge to you. For a complete explanation of the Cisco NX-OS licensing scheme, see the *Cisco NX-OS Licensing Guide*.

## Prerequisites for RIP

- You must enable RIP.
- If you configure VDCs, install the Advanced Services license and enter the desired VDC (see the *Cisco NX-OS Virtual Device Context Configuration Guide*).

## Guidelines and Limitations for RIP

- Cisco NX-OS does not support RIPv1. If Cisco NX-OS receives a RIPv1 packet, it logs a message and drops the packet.
- Cisco NX-OS does not establish adjacencies with RIPv1 routers.
- If you are familiar with the Cisco IOS CLI, be aware that the Cisco NX-OS commands for this feature might differ from the Cisco IOS commands that you would use.

## Default Settings for RIP Parameters

### Default RIP Parameters

Parameters	Default
Maximum paths for load balancing	8
RIP feature	Disabled
Split horizon	Enabled

# Configuring RIP

## Enabling RIP

### Before you begin

Confirm that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>[no] feature rip</b>	Enables the RIP feature.  Use the <b>no</b> form of this command to disable this feature.
<b>Step 3</b>	(Optional) switch(config)# <b>copy running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.
<b>Step 4</b>	(Optional) switch(config)# <b>show feature</b>	Displays enables and disabled features.

### Example

The following example enables RIP:

```
switch # configure terminal
switch(config)# feature rip
switch(config)# copy running-config startup-config
```

## Creating a RIP Instance

You can create a RIP instance and configure the address family for that instance.

### Before you begin

You must enable RIP.

Ensure that you are in the correct VDC (or use the **switchto vdc** command).

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.

	Command or Action	Purpose
<b>Step 2</b>	switch(config)# <b>[no] router rip</b> <i>instance-tag</i>	Creates a new RIP instance with the configured instance-tag.  Use the <b>no</b> form of this command to disable this feature.  <b>Note</b> You must also remove any RIP commands configured in interface mode.
<b>Step 3</b>	switch(config-router)# <b>address-family ipv4 unicast</b>	Configures the address family for this RIP instance and enters address-family configuration mode.
<b>Step 4</b>	(Optional) switch(config-router-af)# <b>show ip rip</b> [ <i>instance instance-tag</i> ] [ <i>vrf vrf-name</i> ]	Displays a summary of RIP information for all RIP instances.
<b>Step 5</b>	(Optional) switch(config-router-af)# <b>distance</b> <i>value</i>	Sets the administrative distance for RIP, in address-family configuration mode. The range is from 1 to 255.
<b>Step 6</b>	(Optional) switch(config-router-af)# <b>maximum-paths</b> <i>number</i>	Configures the maximum number of equal-cost paths that RIP maintains in the route table, in address-family configuration mode. The range is from 1 to 16.
<b>Step 7</b>	(Optional) switch(config-router-af)# <b>copy running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

### Example

The following example creates a RIP instance for IPv4 and sets the number of equal-cost paths for load balancing:

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# max-paths 10
switch(config-router-af)# copy running-config startup-config
```

## Restarting a RIP Instance

You can restart a RIP instance and remove all associated neighbors for the instance.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.

	Command or Action	Purpose
<b>Step 2</b>	switch(config)# <b>restart rip</b> <i>instance-tag</i>	Restarts the RIP instance and removes all neighbors.
<b>Step 3</b>	(Optional) switch(config)# <b>copy running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

### Example

The following example restarts a RIP instance:

```
switch # configure terminal
switch(config)# restart rip Enterprise
switch(config)# copy running-config startup-config
```

## Configuring RIP on an Interface

### Before you begin

- You must enable RIP.
- Confirm that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>interface</b> <i>interface-type slot/port</i>	Enters interface configuration mode.
<b>Step 3</b>	switch(config-if)# <b>ip router rip</b> <i>instance-tag</i>	Associates this interface with a RIP instance.
<b>Step 4</b>	(Optional) switch(config-if)# <b>copy running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.
<b>Step 5</b>	(Optional) switch(config-if)# <b>show ip rip</b> [ <b>instance</b> <i>instance-tag</i> ] <b>interface</b> [ <i>interface-type slot/port</i> ] [ <b>vrf</b> <i>vrf-name</i> ] [ <b>detail</b> ]	Displays RIP information for an interface.

### Example

The following example configures RIP on an Ethernet interface:

```
switch # configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# no switchport
switch(config-if)# ip router rip Enterprise
```

```
switch(config-if)# show ip rip Enterprise ethernet 1/2
switch(config-if)# copy running-config startup-config
```

## Configuring RIP Authentication

You can configure authentication for RIP packets on an interface.

### Before you begin

- You must enable RIP.
- Ensure that you are in the correct VDC (or use the **switchto vdc** command).
- Configure a keychain if necessary before enabling authentication. For details about implementing key chains, see the *Cisco Nexus 7000 Series NX-OS Security Configuration Guide*.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>interface</b> <i>interface-type slot/port</i>	Enters interface configuration mode.
<b>Step 3</b>	switch(config-if)# <b>ip rip authentication mode</b> {text   md5}	Sets the authentication type for RIP on this interface as cleartext or MD5 authentication digest.
<b>Step 4</b>	switch(config-if)# <b>ip rip authentication keychain</b> <i>key</i>	Configures the authentication key used for RIP on this interface.
<b>Step 5</b>	(Optional) switch(config-if)# <b>copy running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

### Example

The following example creates a key chain and configures MD5 authentication on a RIP interface:

```
switch# configure terminal
switch(config)# key chain RIPKey
switch(config)# key-string myrip
switch(config)# accept-lifetime 00:00:00 Jan 01 2000 infinite
switch(config)# send-lifetime 00:00:00 Jan 01 2000 infinite
switch(config)# interface ethernet 1/2
switch(config-if)# ip rip authentication mode md5
switch(config-if)# ip rip authentication keychain RIPKey
switch(config-if)# copy running-config startup-config
```

## Configuring a Passive Interface

You can configure a RIP interface to receive routes but not send route updates by setting the interfaces to passive mode. You can configure a RIP interface in passive mode in the interface configuration mode.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>interface</b> <i>interface-type</i> <i>slot/port</i>	Enters interface configuration mode.
<b>Step 3</b>	switch(config-if)# <b>ip rip passive-interface</b>	Sets the interface into passive mode.
<b>Step 4</b>	(Optional) switch(config-if)# <b>copy</b> <b>running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

### Example

The following example configures a RIP interface in passive mode:

```
switch # configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip rip passive-interface
switch(config-if)# copy running-config startup-config
```

## Configuring Split Horizon with Poison Reverse

You can configure an interface to advertise routes learned by RIP as unreachable over the interface that learned the routes by enabling poison reverse. You can configure split horizon with poison reverse on an interface using the interface configuration mode.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>interface</b> <i>interface-type</i> <i>slot/port</i>	Enters interface configuration mode.
<b>Step 3</b>	switch(config-if)# <b>ip rip poison-reverse</b>	Enables split horizon with poison reverse. Split horizon with poison reverse is disabled by default.
<b>Step 4</b>	(Optional) switch(config-if)# <b>copy</b> <b>running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

### Example

The following example restarts a RIP instance:

```
switch # configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip rip poison-reverse
switch(config-if)# copy running-config startup-config
```

## Configuring Route Summarization

You can create aggregate addresses that are represented in the routing table by a summary address. Cisco NX-OS advertises the summary address metric that is the smallest metric of all the more-specific routes. To configure a summary address on an interface, use the interface configuration mode.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>interface</b> <i>interface-type</i> <i>slot/port</i>	Enters interface configuration mode.
<b>Step 3</b>	switch(config-if)# <b>ip rip summary-address</b> <i>ip-prefix/mask-len</i>	Configured a summary address for RIP for IPv4 addresses.
<b>Step 4</b>	(Optional) switch(config-if)# <b>copy running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

### Example

The following example restarts a RIP instance:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip router rip summary-address 192.0.2.0/24
switch(config-if)# copy running-config startup-config
```

## Configuring Route Redistribution

You can configure RIP to accept routing information from another routing protocol and redistribute that information through the RIP network. Redistributed routes can optionally be assigned a default route.

### Before you begin

- You must enable RIP.
- Ensure that you are in the correct VDC (or use the **switchto vdc** command).
- Configure a route map before configuring redistribution.

**Procedure**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>router rip</b> <i>instance-tag</i>	Creates a new RIP instance with the configured instance-tag.
<b>Step 3</b>	switch(config-router)# <b>address-family ipv4 unicast</b>	Enters address family configuration mode.
<b>Step 4</b>	switch(config-router-af)# <b>redistribute</b> { <b>bgp as</b>   <b>direct</b>   <b>eigrp</b>   <b>isis</b>   <b>ospf</b>   <b>ospfv3</b>   <b>rip</b> } <i>instance-tag</i>   <b>static</b> } <b>route-map</b> <i>map-name</i>	Redistributes routes from other protocols into RIP.
<b>Step 5</b>	(Optional) switch(config-router-af)# <b>default-information originate</b> [ <b>always</b> ] [ <b>route-map</b> <i>map-name</i> ]	Generates a default route into RIP, optionally controlled by a route map.
<b>Step 6</b>	(Optional) switch(config-router-af)# <b>default-metric</b> <i>value</i>	Sets the default metric for all redistributed routes. The range is from 1 to 15. The default is 1.
<b>Step 7</b>	(Optional) switch(config-router-af)# <b>copy running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.
<b>Step 8</b>	(Optional) switch(config-router-af)# <b>show ip rip route</b> [ <i>ip-prefix</i> [ <b>longer-prefixes</b>   <b>shorter-prefixes</b> ]] [ <b>vrf</b> <i>vrf-name</i> ] [ <b>summary</b> ]	Shows the routes in RIP.

**Example**

The following example shows how to redistribute EIGRP into RIP:

```
switch# configure terminal
switch(config)# router rip Enterprise
switch(config-router)# address-family ipv4 unicast
switch(config-router-af)# redistribute eigrp 201 route-map RIPmap
switch(config-router-af)# copy running-config startup-config
```

## Configuring Cisco NX-OS RIP for Compatibility with Cisco IOS RIP

Beginning with Cisco NX-OS Release 6.1, you can configure Cisco NX-OS RIP to behave like Cisco IOS RIP in the way that routes are advertised and processed.

Directly connected routes are treated with cost 1 in Cisco NX-OS RIP and with cost 0 in Cisco IOS RIP. When routes are advertised in Cisco NX-OS RIP, the receiving device adds a minimum cost of +1 to all received routes and installs the routes in its routing table. In Cisco IOS RIP, this cost increment is done on the sending router, and the receiving router installs the routes without any modification. This difference in behavior can cause issues when both Cisco NX-OS and Cisco IOS devices are working together. You can prevent these compatibility issues by configuring Cisco NX-OS RIP to advertise and process routes like Cisco IOS RIP

**Before you begin**

- You must enable RIP.
- Ensure that you are in the correct VDC (or use the **switchto vdc** command).

**Procedure**

	<b>Command or Action</b>	<b>Purpose</b>
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>router rip</b> <i>instance-tag</i>	Creates a new RIP instance with the configured instance-tag. You can enter 100, 201, or up to 20 alphanumeric characters for the instance tag.
<b>Step 3</b>	switch(config-router)# [ <b>no</b> ] <b>metric direct 0</b>	Configures all directly connected routes with cost 0 instead of the default of cost 1 in order to make Cisco NX-OS RIP compatible with Cisco IOS RIP in the way that routes are advertised and processed.  <b>Note</b> This command must be configured on all Cisco NX-OS devices that are present in any RIP network that also contains Cisco IOS devices.
<b>Step 4</b>	(Optional) switch(config-router)# <b>show running-config rip</b>	Displays the current running RIP configuration.
<b>Step 5</b>	(Optional) switch(config-router)# <b>copy running-config startup config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration

**Example**

The following example shows how to disable NX-OS RIP compatibility with Cisco IOS RIP by returning all direct routes from cost 0 to cost 1:

```
switch# configure terminal
switch(config)# router rip 100
switch(config-router)# no metric direct 0
switch(config-router)# show running-config rip
switch(config-router)# copy running-config startup-config
```

## Configuring Virtualization

You can configure multiple RIP instances in each VDC. You can also create multiple VRFs within each VDC and use the same or multiple RIP instances in each VRF. You assign a RIP interface to a VRF.



**Note** Configure all other parameters for an interface after you configure the VRF for an interface. Configuring a VRF for an interface deletes all the configurations for an interface.

### Before you begin

- You must enable RIP.
- Create the VDCs.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	switch# <b>configure terminal</b>	Enters global configuration mode.
<b>Step 2</b>	switch(config)# <b>vrf vrf-name</b>	Creates a new VRF.
<b>Step 3</b>	switch(config-vrf)# <b>exit</b>	Exits VRF configuration mode.
<b>Step 4</b>	switch(config)# <b>router rip instance-tag</b>	Creates a new RIP instance with the configured instance tag.
<b>Step 5</b>	switch(config-router)# <b>vrf vrf-name</b>	Creates a new VRF and enters VRF configuration mode.
<b>Step 6</b>	(Optional) switch(config-router-vrf)# <b>address-family ipv4 unicast</b>	(Optional) Configures the VRF address family for this RIP instance.
<b>Step 7</b>	(Optional) switch(-router-vrf-af)# <b>redistribute {bgp as   direct   {eigrp   isis   ospf   ospfv3   rip} instance-tag   static} route-map map-name</b>	Redistributes routes from other protocols into RIP. See <a href="#">Configuring Route Policy Manager</a> .
<b>Step 8</b>	switch(config-router-vrf-af)# <b>interface ethernet slot/port</b>	Enters interface configuration mode.
<b>Step 9</b>	switch(config-if)# <b>no switchport</b>	Configures the interface as a Layer 3 routed interface.
<b>Step 10</b>	switch(config-if)# <b>vrf member vrf-name</b>	Adds this interface to a VRF.
<b>Step 11</b>	switch(config-if)# <b>ip-address ip-prefix/length</b>	Configures an IP address for this interface. You must perform this step after you assign this interface to a VRF.
<b>Step 12</b>	switch(config-if)# <b>ip router rip instance-tag</b>	Associates this interface with a RIP instance.
<b>Step 13</b>	(Optional) switch(config-if)# <b>copy running-config startup-config</b>	Saves the change persistently through reboots and restarts by copying the running configuration to the startup configuration.

	Command or Action	Purpose
<b>Step 14</b>	(Optional) switch(config-if)# <b>show ip rip</b> [ <b>instance instance-tag</b> ] <b>interface</b> [ <i>interface-type slot/port</i> ] [ <b>vrf vrf-name</b> ]	Displays RIP information for an interface in a VRF.

### Example

The following example shows how to create a VRF and add an interface to the VRF:

```
switch# configure terminal
switch(config)# vrf context RemoteOfficeVRF
switch(config-vrf)# exit
switch(config)# router rip Enterprise
switch(config-router)# vrf RemoteOfficeVRF
switch(config-router-vrf)# address-family ipv4 unicast
switch(config-router-vrf-af)# redistribute eigrp 201 route-map RIPmap
switch(config-router-vrf-af)# interface ethernet 1/2
switch(config-if)# vrf member RemoteOfficeVRF
switch(config-if)# ip address 192.0.2.1/16
switch(config-if)# ip router rip Enterprise
switch(config-if)# copy running-config startup-config
```

## Tuning RIP

You can tune RIP to match your network requirements. RIP uses several timers that determine the frequency of routing updates, the length of time before a route becomes invalid, and other parameters. You can adjust these timers to tune routing protocol performance to better suit your internet work needs.



**Note** You must configure the same values for the RIP timers on all RIP-enabled routers in your network.

### Procedure

	Command or Action	Purpose
<b>Step 1</b>	(Optional) switch(config-router-af)# <b>timers</b> <b>basic</b> <i>update timeout holddown</i> <i>garbage-collection</i>	<p><b>Note</b> This is set in the address-family configuration mode.</p> <p>Sets the RIP timers in seconds. The parameters are as follows:</p> <ul style="list-style-type: none"> <li>• <i>update</i>—The range is from 5 to any positive integer. The default is 30.</li> <li>• <i>timeout</i>—The time that Cisco NX-OS waits before declaring a route as invalid. If Cisco NX-OS does not receive route update information for this route before the timeout interval ends, Cisco NX-OS declares the route as invalid. The range is</li> </ul>

	Command or Action	Purpose
		<p>from 1 to any positive integer. The default is 180.</p> <ul style="list-style-type: none"> <li>• <i>holddown</i>—The time during which Cisco NX-OS ignores better route information for an invalid route. The range is from 0 to any positive integer. The default is 180.</li> <li>• <i>garbage-collection</i>—The time from when Cisco NX-OS marks a route as invalid until Cisco NX-OS removes the route from the routing table. The range is from 1 to any positive integer. The default is 120.</li> </ul>
<b>Step 2</b>	switch(config-router-af)# <b>exit</b>	Exits address-family configuration mode.
<b>Step 3</b>	switch(config-router)# <b>exit</b>	Exits router configuration mode.
<b>Step 4</b>	switch(config)# <b>interface</b> <i>type number</i>	Enters interface configuration mode.
<b>Step 5</b>	(Optional) switch(config-if)# <b>ip rip metric-offset</b> <i>value</i>	<p><b>Note</b> This is set in the interface configuration mode.</p> <p>Adds a value to the metric for every router received on this interface. The range is from 1 to 15. The default is 1.</p>
<b>Step 6</b>	(Optional) switch(config-if)# <b>ip rip route-filter</b> { <b>prefix-list</b> <i>list-name</i>   <b>route-map</b> <i>map-name</i>   [ <b>in</b>   <b>out</b> ]	<p><b>Note</b> This is set in the interface configuration mode.</p> <p>Specifies a route map to filter incoming or outgoing RIP updates.</p>

### Example

The following optional examples show how to tune RIP:

```
switch(config-router-af)# timers basic 40 120 120 100
switch(config-router-af)# exit
switch(config-router)# exit
switch(config)# exit
switch(config)# interface ethernet 1/2
switch(config-if)# ip rip metric-offset 10
switch(config-if)# ip rip route-filter route-map InputMap in
```

## Verifying the RIP Configuration

Use one of the following commands to verify the configuration:

Command	Purpose
<b>show ip rip instance</b> [ <i>instance-tag</i> ] [ <b>vrf</b> <i>vrf-name</i> ]	Displays the status for an instance of RIP.
<b>show ip rip</b> [ <b>instance</b> <i>instance-tag</i> ] <b>interface</b> <i>slot/port detail</i> [ <b>vrf</b> <i>vrf-name</i> ]	Displays the RIP status for an interface
<b>show ip rip</b> [ <b>instance</b> <i>instance-tag</i> ] <b>neighbor</b> [ <i>interface-type number</i> ] [ <b>vrf</b> <i>vrf-name</i> ]	Displays the RIP neighbor table
<b>show ip rip</b> [ <b>instance</b> <i>instance-tag</i> ] <b>route</b> [ <i>ip-prefix/length</i> [ <b>longer-prefixes</b>   <b>shorter-prefixes</b> ]] [ <b>summary</b> ] [ <b>vrf</b> <i>vrf-name</i> ]	Displays the RIP route table
<b>show running-configuration rip</b>	Displays the current running RIP configuration.

## Displaying RIP Statistics

Use one of the following commands to display RIP statistics:

Command	Purpose
<b>show ip rip</b> [ <b>instance</b> <i>instance-tag</i> ] <b>policy statistics</b> <b>redistribute</b> { <b>bgp as</b>   <b>direct</b>   { <b>eigrp</b>   <b>isis</b>   <b>ospf</b>   <b>ospfv3</b>   <b>rip</b> } [ <i>instance-tag</i>   <b>static</b> ] [ <b>vrf</b> <i>vrf-name</i> ]	Displays the RIP policy status. Use the <b>clear ip rip policy</b> command to clear policy statistics.
<b>show ip rip</b> [ <b>instance</b> <i>instance-tag</i> ] <b>statistics</b> [ <i>interface-type number</i> ] [ <b>vrf</b> <i>vrf-name</i> ]	Displays the RIP statistics. Use the <b>clear ip rip statistics</b> command to clear RIP statistics.

Use the **clear ip rip policy** command to clear policy statistics.

Use the **clear ip rip statistics** command to clear RIP statistics.

## Configuration Examples for RIP

This example creates the Enterprise RIP instance in a VRF and adds Ethernet interface 1/2 to this RIP instance. The example also configures authentication for Ethernet interface 1/2 and redistributes EIGRP into this RIP domain.

```
vrf context NewVRF
!
  feature rip
  router rip Enterprise
  vrf NewVRF
  address-family ip unicast
    redistribute eigrp 201 route-map RIPmap
    max-paths 10
!
interface ethernet 1/2
 vrf NewVRF
 ip address 192.0.2.1/16
```

```
ip router rip Enterprise
ip rip authentication mode md5
ip rip authentication keychain RIPKey
```

•

## Related Documents for RIP

Related Topic	Document Title
RIP CLI	<i>Cisco Nexus 7000 Series NX-OS Unicast Routing Command Reference</i>
VDCs and VRFs	<i>Cisco Nexus 7000 Series NX-OS Virtual Device Context Configuration Guide</i>

## Standards for RIP

No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.

## Feature History for RIP

This table includes only the updates for those releases that have resulted in additions or changes to the feature.

Feature Name	Releases	Feature Information
RIP	6.1(1)	Added the ability to configure Cisco NX-OS RIP to be behaviorally compatible with Cisco IOS RIP in the way that routes are advertised and processed.
RIP	4.0(1)	This feature was introduced.

