Configuring RIP

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About RIP

RIP Overview

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

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 (see the Verifying the RIP Configuration section). 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-OSsupports a simple password or an MD5 authentication digest.

You can configure the RIP authentication per interface by using keychain management for the authentication keys. Keychain 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 3600 Series NX-OS Security Configuration Guide for more details about creating keychains.

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

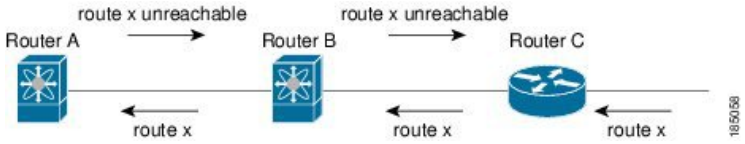
You can use split horizon to ensure that RIP never advertises a route out of the interface where it was learned.

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.

The following figure shows a sample RIP network with split horizon and poison reverse enabled.

Figure 1: RIP with Split Horizon Poison Reverse



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.

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

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 for RIP

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

Licensing Requirements for RIP

Product	License Requirement
Cisco NX-OS	RIP requires no license. Any feature not included in a license package is bundled with the nx-os imag provided at no extra charge to you. For a complete explanation of the Cisco NX-OS licensing scheme, Cisco NX-OS Licensing Guide.

Prerequisites for RIP

- You must enable RIP (see the Enabling RIP section).

Guidelines and Limitations for RIP

RIP has the following configuration guidelines and limitations:

- 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.
- IPv6 is not supported for RIP.

Default Settings for RIP Parameters

The table lists the default settings for RIP parameters.

Default RIP Parameters

Parameters	Default
Maximum paths for load balancing	16
RIP feature	Disabled
Split horizon	Enabled

Configuring RIP

Enabling RIP

You must enable RIP before you can configure RIP.

SUMMARY STEPS

1. **configure terminal**
2. [**no**] **feature rip**
3. (Optional) **show feature**
4. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	[**no**] **feature rip** **Example:** `switch(config)# feature rip`	Enables the RIP feature.
Step 3	(Optional) **show feature** **Example:** `switch(config)# show feature`	Displays enabled and disabled features.
Step 4	(Optional) **copy running-config startup-config** **Example:** `switch(config)# copy running-config startup-config`	Saves this configuration change.

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 (see the Enabling RIP section).

SUMMARY STEPS

1. **configure terminal**
2. **[no] router rip** *instance-tag*
3. **address-family ipv4 unicast**
4. (Optional) **show ip rip** [**instance** *instance-tag*] [**vrf** *vrf-name*]
5. (Optional) **distance** *value*
6. (Optional) **maximum-paths** *number*
7. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**[no] router rip** *instance-tag*
	Example:
	`switch(config)# router RIP Enterprise`
	`switch(config-router)#`
		Creates a new RIP instance with the configured *instance-tag*.

Step 3	**address-family ipv4 unicast**
	Example:
	`switch(config-router)# address-family ipv4 unicast`
	`switch(config-router-af)#`
		Configures the address family for this RIP instance and enters address-family configuration mode.

Step 4	(Optional) **show ip rip** [**instance** *instance-tag*] [**vrf** *vrf-name*] **Example:** `switch(config-router-af)# show ip rip`	Displays a summary of RIP information for all RIP instances.
Step 5	(Optional) **distance** *value* **Example:** `switch(config-router-af)# distance 30`	Sets the administrative distance for RIP. The range is from 1 to 255. The default is 120. See the Administrative Distance section.
Step 6	(Optional) **maximum-paths** *number* **Example:** `switch(config-router-af)# maximum-paths 6`	Configures the maximum number of equal-cost paths that RIP maintains in the route table. The range is from 1 to 64. The default is 16.
Step 7	(Optional) **copy running-config startup-config** **Example:** `switch(config-router-af)# copy running-config startup-config`	Saves this configuration change.

Example

This example shows how to create a RIP instance for IPv4 and set 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.

To restart an RIP instance and remove all associated neighbors, use the following command in global configuration mode:

SUMMARY STEPS

1. **restart rip** *instance-tag*

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**restart rip** *instance-tag* **Example:** `switch(config)# restart rip Enterprise`	Restarts the RIP instance and removes all neighbors.

Configuring RIP on an Interface

Before you begin

You must enable RIP (see the Enabling RIP section).

SUMMARY STEPS

1. **configure terminal**
2. **interface** *interface-type slot/port*
3. **ip router rip** *instance-tag*
4. (Optional) **show ip rip** [**instance** *instance-tag*] **interface** [*interface-type slot/port*] [**vrf** *vrf-name*] [**detail**]
5. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**interface** *interface-type slot/port* **Example:**	Enters interface configuration mode.

	Command or Action	Purpose
	`switch(config)# interface ethernet 1/2` `switch(config-if)#`	
Step 3	**ip router rip** *instance-tag* **Example:** `switch(config-if)# ip router rip Enterprise`	Associates this interface with a RIP instance.
Step 4	(Optional) **show ip rip** [**instance** *instance-tag*] **interface** [*interface-type slot*/*port*] [**vrf** *vrf-name*] [**detail**] **Example:** `switch(config-if)# show ip rip Enterprise tethernet 1/2`	Displays RIP information for an interface.
Step 5	(Optional) **copy running-config startup-config** **Example:** `switch(config-if)# copy running-config startup-config`	Saves this configuration change.

Example

This example shows how to add Ethernet 1/2 interface to a RIP instance:

```
switch# configure terminal
switch(config)# interface ethernet 1/2
switch(config-if)# ip router rip Enterprise
switch(config)# 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 (see the Enabling RIP section).

Configure a keychain if necessary before enabling authentication. For details about implementing keychains, see the Cisco Nexus 3600 Series NX-OS Security Configuration Guide.

SUMMARY STEPS

1. **configure terminal**
2. **interface** *interface-type slot*/*port*
3. **ip rip authentication mode** {**text** | **md5**}
4. **ip rip authentication key-chain** *key*
5. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**interface** *interface-type slot/port*
	Example:
	`switch(config)# interface ethernet 1/2`
	`switch(config-if)#`
		Enters interface configuration mode.

Step 3	**ip rip authentication mode** {**text** | **md5**} **Example:** `switch(config-if)# ip rip authentication mode md5`	Sets the authentication type for RIP on this interface as cleartext or MD5 authentication digest.
Step 4	**ip rip authentication key-chain** *key* **Example:** `switch(config-if)# ip rip authentication key-chain RIPKey`	Configures the authentication key used for RIP on this interface.
Step 5	(Optional) **copy running-config startup-config** **Example:** `switch(config-if)# copy running-config startup-config`	Saves this configuration change.

Example

This example shows how to create a keychain and configure MD5 authentication on a RIP interface:

```
switch# configure terminal
switch(config)# key chain RIPKey
switch(config-keychain)# key 2
switch(config-keychain-key)# accept-lifetime 00:00:00 Jan 01 2000 infinite
switch(config-keychain-key)# send-lifetime 00:00:00 Jan 01 2000 infinite
switch(config-keychain-key)# exit
switch(config-keychain)# exit
switch(config)# interface ethernet 1/2
switch(config-if)# ip rip authentication mode md5
switch(config-if)# ip rip authentication key-chain 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 interface to passive mode.

To configure a RIP interface in passive mode, use the following command in interface configuration mode:

SUMMARY STEPS

1. **ip rip passive-interface**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**ip rip passive-interface** **Example:** `switch(config-if)# ip rip passive-interface`	Sets the interface to passive mode.

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.

To configure split horizon with poison reverse on an interface, use the following command in interface configuration mode:

SUMMARY STEPS

1. **ip rip poison-reverse**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**ip rip poison-reverse** **Example:** `switch(config-if)# ip rip poison-reverse`	Enables split horizon with poison reverse. Split horizon with poison reverse is disabled by default.

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 following command in interface configuration mode:

SUMMARY STEPS

1. **ip rip summary-address** *ip-prefix/mask-len*

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**ip rip summary-address** *ip-prefix/mask-len* **Example:** `switch(config-if)# ip rip summary-address 1.1.1.1/32`	Configures a summary address for RIP for IPv4 addresses.

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 (see the Enabling RIP section)

Configure a route map before configuring redistribution . See the Configuring Route Maps section for details on configuring route maps.

SUMMARY STEPS

1. **configure terminal**
2. **router rip** *instance-tag*
3. **address-family ipv4 unicast**
4. **redistribute** {**bgp** *as* | **direct** | {**eigrp** | **isis** | **ospf** | **ospfv3** | **rip**} *instance-tag* | **static**} **route-map** *map-name*
5. (Optional) **default-information originate** [**always**] [**route-map** *map-name*]
6. (Optional) **default-metric** *value*
7. (Optional) **show ip rip route** [*ip-prefix* [**longer-prefixes** | **shorter-prefixes**]] [**vrf** *vrf-name*] [**summary**]
8. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose
Step 1	**configure terminal** **Example:**	Enters global configuration mode.

	Command or Action	Purpose
	`switch# configure terminal` `switch(config)#`	

Step 2	**router rip** *instance-tag*
	Example:
	`switch(config)# router rip Enterprise`
	`switch(config-router)#`
		Creates a new RIP instance with the configured *instance-tag*.

Step 3	**address-family ipv4 unicast**
	Example:
	`switch(config-router)# address-family ipv4 unicast`
	`switch(config-router-af)#`
		Enters address-family configuration mode.

Step 4	**redistribute** {**bgp** *as* | **direct** | {**eigrp** | **isis** | **ospf** | **ospfv3** | **rip**} *instance-tag* | **static**} **route-map** *map-name* **Example:** `switch(config-router-af)# redistribute eigrp 201 route-map RIPmap`	Redistributes routes from other protocols into RIP.
Step 5	(Optional) **default-information originate** [**always**] [**route-map** *map-name*] **Example:** `switch(config-router-af)# default-information originate always`	Generates a default route into RIP, optionally controlled by a route map.
Step 6	(Optional) **default-metric** *value* **Example:** `switch(config-router-af)# default-metric 2`	Sets the default metric for all redistributed routes. The range is from 1 to 15. The default is 1.
Step 7	(Optional) **show ip rip route** [*ip-prefix* [**longer-prefixes** | **shorter-prefixes**]] [**vrf** *vrf-name*] [**summary**] **Example:** `switch(config-router-af)# show ip rip route`	Shows the routes in RIP.
Step 8	(Optional) **copy running-config startup-config** **Example:** `switch(config-router-af)# copy running-config startup-config`	Saves this configuration change.

Example

This 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

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 (see the Enabling RIP section).

SUMMARY STEPS

1. **configure terminal**
2. **router rip** *instance-tag*
3. [**no**] **metric direct 0**
4. (Optional) **show running-config rip**
5. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**router rip** *instance-tag*
	Example:
	`switch(config)# router rip 100`
	`switch(config-router)#`
		Creates a new RIP instance with the configured instance tag. You can enter 100, 201, or up to 20 alphanumeric chapters for the instance tag.

Step 3	[**no**] **metric direct 0** **Example:** `switch(config-router)# metric direct 0`	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. **Note**

	Command or Action	Purpose
		This command must be configured on all Cisco NX-OS devices that are present in any RIP network that also contains Cisco IOS devices.
Step 4	(Optional) **show running-config rip** **Example:** `switch(config-router)# show running-config rip`	Displays the current running RIP configuration.
Step 5	(Optional) **copy running-config startup-config** **Example:** `switch(config-router)# copy running-config startup-config`	Saves this configuration change.

Example

This example shows how to disable Cisco 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, create multiple VRFs, 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 that interface.

Before you begin

You must enable RIP (see the Enabling RIP section).

SUMMARY STEPS

1. **configure terminal**
2. **vrf context** *vrf-name*
3. **exit**
4. **router rip** *instance-tag*
5. **vrf** *vrf-name*
6. (Optional) **address-family ipv4 unicast**

7. (Optional) **redistribute** {**bgp** *as* | **direct** | {**eigrp** | **isis** | **ospf** | **ospfv3** | **rip**} *instance-tag* | **static**} **route-map** *map-name*
8. **interface ethernet** *slot*/*port*
9. **vrf member** *vrf-name*
10. **ip-address** *ip-prefix*/*length*
11. **ip router rip** *instance-tag*
12. (Optional) **show ip rip** [**instance** *instance-tag*] **interface** [*interface-type slot*/*port*] [**vrf** *vrf-name*]
13. (Optional) **copy running-config startup-config**

DETAILED STEPS

Procedure

	Command or Action	Purpose

Step 1	**configure terminal**
	Example:
	`switch# configure terminal`
	`switch(config)#`
		Enters global configuration mode.

Step 2	**vrf context** *vrf-name*
	Example:
	`switch(config)# vrf context RemoteOfficeVRF`
	`switch(config-vrf)#`
		Creates a new VRF and enters VRF configuration mode.

Step 3	**exit**
	Example:
	`switch(config-vrf)# exit`
	`switch(config)#`
		Exits VRF configuration mode.

Step 4	**router rip** *instance-tag*
	Example:
	`switch(config)# router rip Enterprise`
	`switch(config-router)#`
		Creates a new RIP instance with the configured instance tag.

Step 5	**vrf** *vrf-name*
	Example:
	`switch(config-router)# vrf RemoteOfficeVRF`
	`switch(config-router-vrf)#`
		Creates a new VRF.

Step 6	(Optional) **address-family ipv4 unicast**
	Example:
	`switch(config-router-vrf)# address-family ipv4 unicast`
	`switch(config-router-vrf-af)#`
		Configures the VRF address family for this RIP instance.

Step 7	(Optional) **redistribute** {**bgp** *as* | **direct** | {**eigrp** | **isis** | **ospf** | **ospfv3** | **rip**} *instance-tag* | **static**} **route-map** *map-name*	Redistributes routes from other protocols into RIP.

	Command or Action	Purpose
	Example: `switch(config-router-vrf-af)# redistribute eigrp 201 route-map RIPmap`	See Configuring Route Maps for more information about route maps.

Step 8	**interface ethernet** *slot*/*port*
	Example:
	`switch(config-router-vrf-af)# interface ethernet 1/2`
	`switch(config-if)#`
		Enters interface configuration mode.

Step 9	**vrf member** *vrf-name* **Example:** `switch(config-if)# vrf member RemoteOfficeVRF`	Adds this interface to a VRF.
Step 10	**ip-address** *ip-prefix*/*length* **Example:** `switch(config-if)# ip address 192.0.2.1/16`	Configures an IP address for this interface. You must perform this step after you assign this interface to a VRF.
Step 11	**ip router rip** *instance-tag* **Example:** `switch(config-if)# ip router rip Enterprise`	Associates this interface with a RIP instance.
Step 12	(Optional) **show ip rip** [**instance** *instance-tag*] **interface** [*interface-type slot*/*port*] [**vrf** *vrf-name*] **Example:** `switch(config-if)# show ip rip Enterprise ethernet 1/2`	Displays RIP information for an interface in a VRF.
Step 13	(Optional) **copy running-config startup-config** **Example:** `switch(config-if)# copy running-config startup-config`	Saves this configuration change.

Example

This 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 internetwork needs.

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

You can use the following optional commands in address-family configuration mode to tune RIP:

Command	Purpose
timers basic *update timeout holddown garbage-collection* **Example:** `switch(config-router-af)# timers basic 40 120 120 100`	Sets the RIP timers in seconds. The parameters are as follows: • *update*—The range is from 5 to any positive integer. The default is 30. • *timeout*—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 from 1 to any positive integer. The default is 180. • *holddown*—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. • *garbage-collection*—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.

You can use the following optional commands in interface configuration mode to tune RIP:

Command	Purpose
ip rip metric-offset *value* **Example:** `switch(config-if)# ip rip metric-offset 10`	Adds a value to the metric for every route received on this interface. The range is from 1 to 15. The default is 1.
ip rip route-filter {**prefix-list** *list-name* | **route-map** *map-name* | [**in** | **out**] **Example:** `switch(config-if)# ip rip route-filter route-map InputMap in`	Specifies a route map to filter incoming or outgoing RIP updates.

Verifying the RIP Configuration

To display the RIP configuration, perform one of the following tasks:

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

Displaying RIP Statistics

To display RIP statistics, use the following commands:

Command	Purpose
show ip rip [**instance** *instance-tag*] **policy statistics redistribute** {**bgp** *as* | **direct** | {**eigrp** | **isis** | **ospf** | **ospfv3** | **rip**} *instance-tag* | **static**} [**vrf** *vrf-name*]	Displays the RIP policy statistics.
show ip rip [**instance** *instance-tag*] **statistics** *interface-type number* [**vrf** *vrf-name*]	Displays the RIP statistics.

Use the **clear rip policy statistics redistribute** *protocol process-tag* command to clear policy statistics.

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

Configuration Examples for RIP

The following example shows how to create the Enterprise RIP instance in a VRF and add Ethernet interface 1/2 to this RIP instance. The example also shows how to configure authentication for Ethernet interface 1/2 and redistribute EIGRP into this RIP domain.

```
vrf context NewVRF
!
 feature rip
 router rip Enterprise
  vrf NewVRF
   address-family ipv4 unicast
    redistribute eigrp 201 route-map RIPmap
    maximum-paths 10
!
```

```
interface ethernet 1/2
 vrf member NewVRF
 ip address 192.0.2.1/16
 ip router rip Enterprise
 ip rip authentication mode md5
 ip rip authentication key-chain RIPKey
```

Related Topics

See Configuring Route Policy Manager for more information on route maps.

Related Topics