



RIP Commands

Use the commands in this chapter to configure and monitor Routing Information Protocol (RIP). For RIP configuration information and examples, refer to the “Configuring RIP” chapter of the *Network Protocols Configuration Guide, Part 1*.

auto-summary

To restore the default behavior of automatic summarization of subnet routes into network-level routes, use the **auto-summary** router configuration command. To disable this feature and transmit subprefix routing information across classful network boundaries, use the **no** form of this command.

auto-summary
no auto-summary

Syntax Description

This command has no arguments or keywords.

Default

Enabled (the software summarizes subprefixes to the classful network boundary when crossing classful network boundaries).

Command Mode

Router configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

Route summarization reduces the amount of routing information in the routing tables.

RIP Version 1 always uses automatic summarization. If you are using RIP Version 2, you can turn off automatic summarization by specifying **no auto-summary**. Disable automatic summarization if you must perform routing between disconnected subnets. When automatic summarization is off, subnets are advertised.

Example

In the following example, network numbers are not summarized automatically:

```
router rip
  version 2
  no auto-summary
```

default-information originate

To generate a default route into RIP, use the **default-information originate** router configuration command. To disable this feature, use the **no** form of this command.

```
default-information originate [route-map mapname]  
no default-information originate
```

Syntax Description

route-map *mapname* (Optional) Routing process will generate the default route if the route map is satisfied.

Default

Disabled

Command Mode

Router configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

Example

The following example originates a default route (0.0.0.0/0) over a certain interface when 172.68.0.0/16 is present. This is called “conditional default origination.”

```
router rip  
  version 2  
  network 172.68.16.0  
  default-information originate route-map condition  
!  
  route-map condition permit 10  
  match ip address 10  
  set interface s1/0  
!  
access-list 10 permit 172.68.16.0 0.0.0.255  
!
```

default-metric

To set default metric values for RIP, use this form of the **default-metric** router configuration command. To return to the default state, use the **no** form of this command.

default-metric *number*
no default-metric [*number*]

Syntax Description

number Default metric value.

Default

Built-in, automatic metric translations, as appropriate for each routing protocol

Command Mode

Router configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

The **default-metric** command is used in conjunction with the **redistribute** router configuration command to cause the current routing protocol to use the same metric value for all redistributed routes. A default metric helps solve the problem of redistributing routes with incompatible metrics. Whenever metrics do not convert, using a default metric provides a reasonable substitute and enables the redistribution to proceed.

Example

The following example shows a router in autonomous system 109 using both the RIP and the OSPF routing protocols. The example advertises OSPF-derived routes using the RIP protocol and assigns the OSPF-derived routes a RIP metric of 10.

```
router rip
  default-metric 10
  redistribute ospf 109
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

redistribute

ip rip authentication key-chain

To enable authentication for RIP Version 2 packets and to specify the set of keys that can be used on an interface, use the **ip rip authentication key-chain** interface configuration command. Use the **no** form of this command to prevent authentication.

```
ip rip authentication key-chain name-of-chain  
no ip rip authentication key-chain [name-of-chain]
```

Syntax Description

name-of-chain Enables authentication and specifies the group of keys that are valid.

Default

No authentication is provided for RIP packets.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

If no key chain is configured with the **key-chain** command, no authentication is performed on the interface (not even the default authentication).

Example

The following example configures the interface to accept and send any key belonging to the key chain named *trees*:

```
ip rip authentication key-chain trees
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

key chain

ip rip authentication mode

To specify the type of authentication used in RIP Version 2 packets, use the **ip rip authentication mode** interface configuration command. Use the **no** form of this command to restore clear text authentication.

ip rip authentication mode {text | md5}
no ip rip authentication mode

Syntax Description

text	Clear text authentication.
md5	Keyed MD5 authentication.

Default

Clear text authentication is provided for RIP packets.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

RIP Version 1 does not support authentication.

Example

The following example configures the interface to use MD5 authentication:

```
ip rip authentication mode md5
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

ip rip authentication key-chain
key chain

ip rip receive version

To specify a RIP version to receive on an interface basis, use the **ip rip receive version** interface configuration command. Use the **no** form of this command to follow the global **version** rules.

ip rip receive version [1] [2]
no ip rip receive version

Syntax Description

- | | |
|----------|---|
| 1 | (Optional) Accepts only RIP Version 1 packets on the interface. |
| 2 | (Optional) Accepts only RIP Version 2 packets on the interface. |

Default

The software behaves according to the **version** command.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

Use this command to override the default behavior of RIP as specified by the **version** command. This command applies only to the interface being configured. You can configure the interface to accept both RIP versions.

Examples

The following example configures the interface to receive both RIP Version 1 and Version 2 packets:

```
ip rip receive version 1 2
```

The following example configures the interface to receive only RIP Version 1 packets:

```
ip rip receive version 1
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

ip rip send version
version

ip rip send version

To specify a RIP version to send on an interface basis, use the **ip rip send version** interface configuration command. Use the **no** form of this command to follow the global **version** rules.

ip rip send version [1] [2]
no ip rip send version

Syntax Description

- | | |
|----------|--|
| 1 | (Optional) Sends only RIP Version 1 packets out the interface. |
| 2 | (Optional) Sends only RIP Version 2 packets out the interface. |

Default

The software behaves according to the router **version** command.

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

Use this command to override the default behavior of RIP as specified by the router **version** command. This command applies only to the interface being configured.

Examples

The following example configures the interface to send both RIP Version 1 and Version 2 packets out the interface:

```
ip rip send version 1 2
```

The following example configures the interface to send only RIP Version 2 packets out the interface:

```
ip rip send version 2
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

ip rip receive version
version

ip split-horizon

To enable the split horizon mechanism, use the **ip split-horizon** interface configuration command. To disable the split horizon mechanism, use the **no** form of this command.

ip split-horizon
no ip split-horizon

Syntax Description

This command has no arguments or keywords.

Default

Varies with media

Command Mode

Interface configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

For all interfaces except those for which either Frame Relay or SMDS encapsulation is enabled, the default condition for this command is **ip split-horizon**; in other words, the split horizon feature is active. If the interface configuration includes either the **encapsulation frame-relay** or **encapsulation smds** commands, then the default is for split horizon to be disabled. Split horizon is not disabled by default for interfaces using any of the X.25 encapsulations.

Note For networks that include links over X.25 PSNs, the **neighbor** router configuration command can be used to defeat the split horizon feature. You can as an alternative *explicitly* specify the **no ip split-horizon** command in your configuration. However, if you do so you *must* similarly disable split horizon for all routers in any relevant multicast groups on that network.

If split horizon has been disabled on an interface and you wish to enable it, use the **ip split-horizon** command to restore the split horizon mechanism.

Note In general, changing the state of the default for the **ip split-horizon** command is not recommended, unless you are certain that your application requires a change in order to properly advertise routes. If split horizon is disabled on a serial interface (and that interface is attached to a packet-switched network), you *must* disable split horizon for all routers and access servers in any relevant multicast groups on that network.

Example

The following simple example disables split horizon on a serial link. The serial link is connected to an X.25 network:

```
interface serial 0
 encapsulation x25
 no ip split-horizon
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

neighbor

neighbor (IGRP and RIP)

To define a neighboring router with which to exchange routing information, use this form of the **neighbor** router configuration command. To remove an entry, use the **no** form of this command.

```
neighbor ip-address  
no neighbor ip-address
```

Syntax Description

<i>ip-address</i>	IP address of a peer router with which routing information will be exchanged.
-------------------	---

Default

No neighboring routers are defined.

Command Mode

Router configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command permits the point-to-point (nonbroadcast) exchange of routing information. When used in combination with the **passive-interface** router configuration command, routing information can be exchanged between a subset of routers and access servers on a LAN.

Multiple **neighbor** commands can be used to specify additional neighbors or peers.

Example

In the following example, RIP updates are sent to all interfaces on network 131.108.0.0 except interface Ethernet 1. However, in this case a **neighbor** router configuration command is included. This command permits the sending of routing updates to specific neighbors. One copy of the routing update is generated per neighbor.

```
router rip  
network 131.108.0.0  
passive-interface ethernet 1  
neighbor 131.108.20.4
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

passive-interface

network (RIP)

To specify a list of networks for the Routing Information Protocol (RIP) routing process, use this form of the **network** router configuration command. To remove an entry, use the **no** form of this command.

network *network-number*
no network *network-number*

Syntax Description

network-number IP address of the network of directly connected networks.

Default

No networks are specified.

Command Mode

Router configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

The network number specified must not contain any subnet information. There is no limit to the number of **network** commands used on the router. RIP routing updates will be sent and received only through interfaces on this network.

RIP sends updates to the interfaces in the specified networks. Also, if an interface's network is not specified, it will not be advertised in any RIP update.

Example

The following example defines RIP as the routing protocol to be used on all interfaces connected to networks 128.99.0.0 and 192.31.7.0:

```
router rip
 network 128.99.0.0
 network 192.31.7.0
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

router rip

offset-list

To add an offset to incoming and outgoing metrics to routes learned via RIP, use the **offset-list** router configuration command. To remove an offset list, use the **no** form of this command.

```
offset-list {access-list-number | name} {in | out} offset [type number]
no offset-list {access-list-number | name} {in | out} offset [type number]
```

Syntax Description

<i>access-list-number</i> <i>name</i>	Standard access list number or name to be applied. Access list number 0 indicates all access lists. If <i>offset</i> is 0, no action is taken. For IGRP, the offset is added to the delay component only.
in	Applies the access list to incoming metrics.
out	Applies the access list to outgoing metrics.
<i>offset</i>	Positive offset to be applied to metrics for networks matching the access list. If the offset is 0, no action is taken.
<i>type</i>	(Optional) Interface type to which the offset-list is applied.
<i>number</i>	(Optional) Interface number to which the offset-list is applied.

Default

Disabled

Command Mode

Router configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0. The *type* and *number* arguments first appeared in Cisco IOS Release 10.3. The *name* argument first appeared in Cisco IOS Release 11.2.

The offset value is added to the routing metric. An offset-list with an interface type and interface number is considered extended and takes precedence over an offset-list that is not extended. Therefore, if an entry passes the extended offset-list and the normal offset-list, the extended offset-list's offset is added to the metric.

Examples

In the following example, the router applies an offset of 10 to the router's delay component only to access list 21:

```
offset-list 21 out 10
```

In the following example, the router applies an offset of 10 to routes learned from Ethernet interface 0:

```
offset-list 21 in 10 ethernet 0
```

output-delay

To change the interpacket delay for RIP updates sent, use the **output-delay** router configuration command. To remove the delay, use the **no** form of this command.

```
output-delay delay  
no output-delay [delay]
```

Syntax Description

delay Delay, in milliseconds, between packets in a multiple-packet RIP update. The range is 8 to 50 milliseconds. The default is no delay.

Default

0 milliseconds

Command Mode

Router configuration

Usage Guidelines

Consider using this command if you have a high-end router sending at high speed to a low-speed router that might not be able to receive at that fast a rate. Configuring this command will help prevent the routing table from losing information.

Example

In the following example, the interpacket delay is set to 10 milliseconds:

```
output-delay 10
```

router rip

To configure the Routing Information Protocol (RIP) routing process, use the **router rip** global configuration command. To turn off the RIP routing process, use the **no** form of this command.

router rip
no router rip

Syntax Description

This command has no arguments or keywords.

Default

No RIP routing process is defined.

Command Mode

Global configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

Example

The following example shows how to begin the RIP routing process:

```
router rip
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

network (RIP)

timers basic

To adjust RIP network timers, use the **timers basic** router configuration command. To restore the default timers, use the **no** form of this command.

timers basic *update invalid holddown flush*
no timers basic

Syntax Description

<i>update</i>	Rate in seconds at which updates are sent. This is the fundamental timing parameter of the routing protocol. The default is 30 seconds.
<i>invalid</i>	Interval of time in seconds after which a route is declared invalid; it should be at least three times the value of <i>update</i> . A route becomes invalid when there is an absence of updates that refresh the route. The route then enters holddown. The route is marked inaccessible and advertised as unreachable. However, the route is still used for forwarding packets. The default is 180 seconds.
<i>holddown</i>	Interval in seconds during which routing information regarding better paths is suppressed. It should be at least three times the value of <i>update</i> . A route enters into a holddown state when an update packet is received that indicates the route is unreachable. The route is marked inaccessible and advertised as unreachable. However, the route is still used for forwarding packets. When holddown expires, routes advertised by other sources are accepted and the route is no longer inaccessible. The default is 180 seconds.
<i>flush</i>	Amount of time in seconds that must pass before the route is removed from the routing table; the interval specified should be greater than the <i>invalid</i> value. If it is less than this sum, the proper holddown interval cannot elapse, which results in a new route being accepted before the holddown interval expires. The default is 240 seconds.

Defaults

update is 30 seconds
invalid is 180 seconds
holddown is 180 seconds
flush is 240 seconds

Command Mode

Router configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

The basic timing parameters for RIP are adjustable. Since RIP is executing a distributed, asynchronous routing algorithm, it is important that these timers be the same for all routers and access servers in the network.

Note The current and default timer values can be seen by inspecting the output of the **show ip protocols EXEC** command. The relationships of the various timers should be preserved as described previously.

Example

In the following example, updates are broadcast every 5 seconds. If a router is not heard from in 15 seconds, the route is declared unusable. Further information is suppressed for an additional 15 seconds. At the end of the suppression period, the route is flushed from the routing table.

```
router rip
 timers basic 5 15 15 30
```

Note that by setting a short update period, you run the risk of congesting slow-speed serial lines; however, this is not a big concern on faster-speed Ethernets and T1-rate serial lines. Also, if you have many routes in your updates, you can cause the routers to spend an excessive amount of time processing updates.

validate-update-source

To have the Cisco IOS software validate the source IP address of incoming routing updates for RIP and IGRP routing protocols, use the **validate-update-source** router configuration command. To disable this function, use the **no** form of this command.

validate-update-source
no validate-update-source

Syntax Description

This command has no arguments or keywords.

Default

Enabled

Command Mode

Router configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 10.0.

This command is only applicable to RIP and IGRP. The software ensures that the source IP address of incoming routing updates is on the same IP network as one of the addresses defined for the receiving interface.

Disabling split horizon on the incoming interface will also cause the system to perform this validation check.

For unnumbered IP interfaces (interfaces configured as **ip unnumbered**), no checking is performed.

Example

In the following example, a router is configured to not perform validation checks on the source IP address of incoming RIP updates:

```
router rip
 network 128.105.0.0
 no validate-update-source
```

version

To specify a RIP version used globally by the router, use the **version** router configuration command. Use the **no** form of this command to restore the default value.

```
version {1 | 2}  
no version
```

Syntax Description

- | | |
|----------|--------------------------|
| 1 | Specifies RIP Version 1. |
| 2 | Specifies RIP Version 2. |

Default

The software receives RIP Version 1 and Version 2 packets, but sends only Version 1 packets.

Command Mode

Router configuration

Usage Guidelines

This command first appeared in Cisco IOS Release 11.1.

To specify RIP versions used on an interface basis, use the **ip rip receive version** and **ip rip send version** commands.

Example

The following example enables the software to send and receive RIP Version 2 packets:

```
version 2
```

Related Commands

You can use the master indexes or search online to find documentation of related commands.

```
ip rip receive version  
ip rip send version  
show ip protocols
```

