RIP

RIP Implementations

RIPv1
Original RIP implementation, limited to classful routing (obsolete)

RIPv2
Introduced support for classless routing, authentication, triggered updates, and multicast announcements (RFC 2453)

RIPng (RIP Next Generation)
Extends RIPv2 to support IPv6 routing (RFC 2080); functions very similarly to RIPv2 and is subsequently as limited

Protocols Comparison

	RIPv1	RIPv2	RIPng
IP	IPv4	IPv4	IPv6
Admin Distance	120	120	120
UDP Port	520	520	521
Classless	No	Yes	Yes
Adv. Address	Broadcast	224.0.0.9	FF02::9
Authentication	None	Plain, MD5	None

RIPv2 Configuration

```
! Enable RIPv2 IPv4 routing
router rip
 version 2

 ! Disable RIPv2 automatic summarization
 no auto-summary

 ! Designate RIPv2 interfaces by network
 network network

 ! Identify unicast-only neighbors
 neighbor IP-address

 ! Originate a default route
 default-information originate

 ! Designate passive interfaces
 passive-interface {interface | default}

 ! Modify timers
 timers basic update invalid hold flush
```

RIPng Configuration

```
! Enable IPv6 routing
ipv6 unicast-routing

! Enable RIPng IPv6 routing
ipv6 router rip name

 ! Toggle split-horizon and poison-reverse
 [no] split-horizon
 [no] poison-reverse

 ! Modify timers
 timers basic update invalid hold flush
```

Attributes

Type	Distance Vector
Algorithm	Bellman-Ford
Admin Distance	120
Metric	Hop count (max 15)
Standard	RFCs 2080, 2453
Protocols	IPv4, IPv6
Transport	UDP
Authentication	Plaintext, MD5
Multicast IP	224.0.0.9/FF02::9

Terminology

Split Horizon
A rule that states a router may not advertise a route back to the neighbor from which it was learned

Route Poisoning
When a network becomes unreachable, an update with an infinite metric is generated to explicitly advertise the route as unreachable

Poison Reverse
A router advertises a network as unreachable through the interface on which it was learned

Timer Defaults

Update	30 sec	**Flush**	240 sec
Invalid	180 sec	**Hold-down**	180 sec

RIPv2 Interface Configuration

```
! Configure manual route summarization
ip summary-address rip network mask

! Enable MD5 authentication (RIPv2 only)
ip rip authentication mode md5
ip rip authentication key-chain key-chain
```

RIPng Interface Configuration

```
! Enable RIPng on the interface
ipv6 rip name enable

! Configure manual route summarization
ipv6 rip name summary-address prefix
```

Troubleshooting

```
show ip[v6] protocols
```

```
show ip[v6] rip database
```

```
show ip[v6] route rip
```

```
debug ip rip { database | events }
```

```
debug ipv6 rip [interface]
```