Cisco™ CCNA : RIPv1 and RIPv2

Features of RIPv1

1. RIPv1 (and v2) is a distance-vector Routing protocol
2. RIPv1 a classful routing protocol. Classful routing protocols support only the networks which are not sub netted. Classful routing protocols do not send sub net information with their routing updates.
3. RIPv1 does not support VLSM (Variable Length Sub net Masking)
4. RIPv1 (and v2) support maximum metric (hop count) value of 15. Any router farther than 15 hops away is considered as unreachable.
5. RIPv1 sends routing updates periodically every 30 seconds as broadcasts using destination IP address as limited broadcast IP address 255.255.255.255.
6. 25 routes per RIP message.
7. Implements split horizon with poison reverse.
8. Implements triggered updates.
9. No support for authentication.

Limitations of RIPv1

When compared with RIPv2, the inability to support subnets is big limitation on v1. Further, authentication is not supported.

Limitations of RIP v2

One of the biggest limitations of RIPv1 still remains with RIPv2. It is hop count limitation, and metric. The hop count of 16 still remains as unreachable, and the metric still remains hop count. A smaller hop count limits the network diameter, that is the number of routers that can participate in the RIP network.

The command syntax for configuring RIPv1 on a router is:

router rip
network <network number>

The command syntax for configuring RIPv2 on a router is:

router rip
version 2
network <network number>

Features of RIPv2

1. Distance-vector protocol. (Same as v1)
2. Classless protocol (support for CIDR).
3. Supports VLSMs.
4. Metric is router hop count. Maximum hop count is 15; A hop count of 16 represents unreachable route. (same as RIP v1)
5. Periodic route updates sent every 30 seconds to multicast address 224.0.0.9
6. Supports authentication and encrypted password for route updates
7. Implements split horizon with poison reverse. (same as v1)
8. Implements triggered updates. (Same as v1)
9. Administrative distance for RIPv1 as well as v2 is 120.
10. Used in small, flat networks or at the edge of larger networks. This is primarily due to hop count limitation.

Important terms used in RIPv2

Hold-down timer : Helps preventing routing loops during periods when the topology is converging

Split Horizon : Blocks the information about routes from being advertised by any router to the interface from which the information originated.

Defining a maximum count : Used for preventing Updates from looping the network indefinitely.

Route Poisoning : Advertises an infinite metric for a failed route to all its neighbors

Triggered update : Allows a RIP router to announce route changes almost immediately rather than waiting for the next periodic announcement.

Important commands in RIP

ip protocols : Displays routing protocols information and timers. This is a very useful command in identifying any protocol related problems.

show protocols : The show protocols command shows the global and interface-specific status of any configured Level 3 protocol.

show ip route : Displays the routing table

debug ip rip: Displays rip updates being sent and received on your routershow

no debug all : turns off all debugging (can also use the command (“undebug all”)

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