

RIP & EIGRP

RIP is a type of distance vector IGP, uses hop as metric where bandwidth is irrelevant and the maximum hop count is 15, anything larger is considered unreachable and not inserted in routing table that's why it can't be used for very large nets.

IPv4 versions → RIPv1 & RIPv2, IPv6 version → RIPng.

Message types: request → to ask RIP-enabled routers to send their routing table and response to share the local router's routing table, by default RIP-enabled routers will share their routing tables every 30 seconds.

RIPv1: very old, only advertises classful addresses (A, B, C), no VLSM or CIDR, doesn't include subnet mask in advertisements, messages are broadcasted to 255.255.255.255 so all routers in local segment receive the message.

RIPv2: supports VLSM and CIDR, includes subnet mask information in advertisements, messages are multicast to 224.0.0.9 (multicast message is a message delivered only to devices that have joined that specific multicast group).

Command: `router rip` to enter rip configuration mode then configure version, no auto-summary for VLSM, networks.

Network command: look for interfaces with IP address in specified range, active RIP on them, form adjacency with connected neighbors and advertise the real network prefix of the interface.

Passive-interface <interface>: to stop sending RIP traffic on an interface where no adjacencies are formed.

To share default route in RIP use command `default-information originate`.

Command: `show ip protocols` to check various stats.

By default RIP can send up to 4 paths to the same destination into the routing table with the same hop count.

Can be changed by command: `maximum-paths <number of paths>`.

Can change administrative distance by command: `distance <distance>`.

EIGRP: advanced/hybrid distance vector routing protocol, much faster than RIP in reacting to network changes, doesn't have max hop count of 15, send messages via the multicast address 224.0.0.10, and the only IGP that can perform unequal cost load balancing proportion to their Bandwidths by default it performs ECMP load-balancing over 4 paths like RIP.

Command: `eigrp <AS>` to use eigrp and AS must match between routers or no adjacency will be formed.

You can use a mask with EIGRP network command, uses a wildcard subnet mask which is an inverted subnet mask.

For the metric it uses the bandwidth of the slowest link in the path plus the sum of the delay values of all the links in the path (k1, k3) are used by default and remaining up to k5 are zeroes. (can be changed with configuration).

Router id is either: 1- manually configured. 2- Highest IP address on a loopback interface. 3- Highest IP address on a physical interface.

To change ID manually use command: `EIGRP router-id <4 octet id>`.

To configure a loopback interface use command `interface loopback <number>` (common 32 subnet mask).

Command: `sh ip eigrp neighbors`.

Command: `sh ip route <type>` to show specific type of routes only.

Command: `do sh ip eigrp topology`.

The delay value is a default value based on interface bandwidth.

Feasible distance: the router's metric value to the route's destination.

Reported/Advertised distance: the neighbor's metric value to the destination.

Successor: the best route with the lowest metric to the destination.

Feasible successor: an alternate route to the destination rather than the best route meeting feasibility conditions.

Feasibility condition: a route is a feasible successor if its reported distance is lower than the successor route's feasible distance.

Command: `variance <multiplier>` → multiples of successive routes used for load balancing. (only performed on feasible successor routes).