# EIGRP

**General Information**

* It is not a true link protocol. It is a Distance Vector protocol.
* It is a classless protocol. It supports VLSM.
* It guarantees that the topology is loop free.
* Forms active neighbor adjacencies. It basically can track if neighbor routers are down or up.
* Guarantees packet delivery by using RTP
* Support true load distribution. It supports equal and unequal load balancing
* Can use authentication between neighbors in order to avoid rogue routers being plugged in.

**How it works in summary.**

**Neighbor Discovery**

* Discovers EIGRP neighbors (direct connected routers). It does that by sending Hello multicast packets. It uses its own protocol called 88 on destination address 224.0.0.10
* Exchanges Topology information. The routers do not have overall view of the topology, thus why it is a Vector Distance. It uses its own protocol called 88 on destination address 224.0.0.10. Once the neighbors are discovered then UPDATE packets are being sent which may contain information such as: Next-hop, Bandwidth, Delay, Load, Reliability, MTU, Hop Count. Typically we use Bandwidth and Delay in order to perform Metric calculations for the best path available.
* Chooses best path by using Dual, which will choose a loop free route or a route which does not have packet loses.
* Neighbor and Topology Table maintenance
* A neighbor is declared as down when the neighbor is no longer sending Alive packets. The neighbor dictates how often Alive packets will be sent. If neighbor A says to B I will send a Alive packet every 30 seconds then B will wait for an Alive packet to come in after 30 seconds. if it does not come then A is declared as being down.
* If a neighbor does not reply, the neighbor is being removed from the topology and a query is being sent to find out if there is an alternative path to the destination.
* Split Horizon: Do not advertise routes out of the link they came in.

**Loop Prevention**

* Split Horizon: Do not advertise routes out the link they came in.
* DUAL Feasibility Condition: Choosing a path according to metric. Router A examines the distance to the destination from Router B. If router B has a smaller metric, then router B is a loop free route towards the destination.
  + Successor: Is the actual path towards the destination.
  + Feasible Distance: Is the actual metric (value) of the best path.
  + Feasible Successor: Is the backup path towards the desitnation.
  + Local Distance: Is the metric to reach a neighbor router.
  + Advertised Distance: Is the feasible distance to the destination that is being advertised by a router. Note, that same route is the Feasible Distance for the router it self. If router B is advertising a metric of 5 to the destination and the metric between router A and B is 5, then the metric for the Feasible Distance is 10. The best path is choses according to the lowest result of AD+LD.
  + The actual metrics are determined by two factors on the default setting of EIGRP, which are Bandwidth, Delay.