Cisco Express Forwarding (CEF)

Cisco Express Forwarding (CEF) is a packet-switching technique that is the default for many of Cisco's router.It provides the ability to switch packets through a device in a very quick efficient way while also keeping the load on the router's processor low.CEF is made up of two different main components: the Forwarding Information Base (FIB) and the Adjacency Table. These are automatically updated at the same time as the routing table

Forwarding Information Base (FIB)

The FIB contains destination reachability information as well as next hop information. This information is then used by the router to make forwarding decisions.

Adjacency Table

The FIB is combined along with an adjacency table. For a node to be considered adjacent it must be reachable within a single hop of the data link layer (e.g. ethernet hop). The adjacency table is tasked with maintaining the layer 2 next-hop information for the FIB.

The adjacency table contains a number of different types of adjacency:

Host route adjacency: A host route adjacency entry is used to specify that a specific host is within one layer two hop.

Null adjacency: This is used for packets which are destined for the Null0 interface.

Glean adjacency: A glean adjacency is used when a device is connected to multiple hosts off the same interface. In this case, the entry contains a prefix for the subnet not just for a specific host entry.

Punt adjacency: This is used for those packets that utilize features not currently supported by CEF and which must be forwarding to the next switching level (often to be process switched).

Discard adjacency: A discard adjacency entry is used for those packets that are to be automatically dropped.

Drop adjacency: A drop adjacency entry is used for those packets which dropped but only after the prefix is checked.