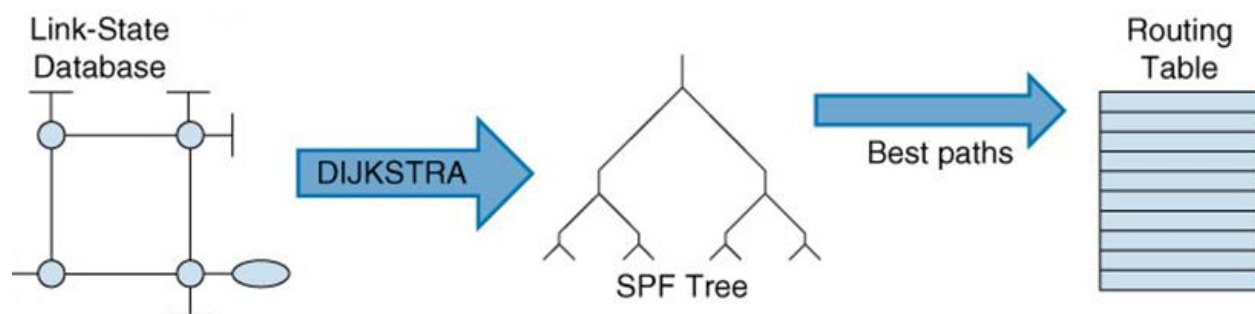


## OSPF (Open Shortest Path First) protocol:

- o OSPF is term which stands for Open Shortest Path First.
- o Link State protocol sends update based in state of the link.
- o When a link comes up and goes down it sends the updates.
- o OSPF protocols is a dynamic open standard Routing Protocol.
- o OSPF protocols is the Link-State dynamic routing protocol.
- o OSPF protocols uses the Shortest Path First (SPF) algorithm.
- o OSPF protocols uses IP protocol type **89** (not TCP or UDP).
- o OSPF External and Internal Administrative Distance is **110**.
- o OSPF is a classless Routing protocol and OSPF metric is Cost.
- o OSPF use multicast address **224.0.0.5** to send the hello packet.
- o OSPF use multicast address **224.0.0.6** for all designated routers.
- o OSPF default Hello time is **10 seconds** and dead time is **40 seconds**.
- o OSPF protocols supports both the VLSM and route summarization.
- o OSPF use wildcard mask, which is the reciprocal of subnet mask.
- o OSPF protocols supports both MD5 and clear text authentication.
- o OSPF protocols supports the summarization at ABRs router only.
- o OSPF are requires more memory and CPU processing to run.
- o OSPF work on area, Area 0 is the backbone of OSPF technology.
- o OSPF have Neighbor table, Topology table and Routing table.
- o OSPF packets are only sends to the neighbor of own Area.
- o OSPF protocols supports both IPv4 and IPv6 routed protocols.
- o OSPF load balancing with equal cost routes for same destination.
- o OSPF dynamic routing protocols supports unlimited hop counts.
- o OSPF protocols supports trigger updates for fast convergence.
- o OSPF sends update with a sequence number of **0x80000001**.
- o The sequence number ends with **0x7FFFFFFF** and start again.
- o The sequence number will increment by one in every updates.
- o OSPF protocol is more complex to setup and hard to troubleshoot.



In OSPF, each router maintains a complete map of the network topology. When a change occurs in the network, such as when a link goes down or comes back up, each router updates its map accordingly and then calculates the shortest path to every destination using Dijkstra algorithm. The resulting paths are then stored in the form of routing table entries and used to route packets accordingly.

When configured, OSPF will listen to neighbors and collect all link state information available to build a topological map of all available paths within its network. Then it stores the information in its topological database, the Link State Database (LSDB). After gathering the necessary information, it will calculate the shortest paths to each reachable subnets/network using a Shortest Path First (SPF) algorithm.

OSPF is a widely used routing protocol, especially in large enterprise networks. It is also used as a base routing protocol or as a network backbone in some service provider networks. Most major router vendors, including Cisco, Juniper, etc., support OSPF.

Basically, OSPF is a hierarchical routing protocol. This is because an OSPF network can be subdivided into routing areas to simplify administration and optimize traffic and resource utilization. We identify areas by 32-bit numbers. We can express these as in decimal or in the same dotted decimal notation used for IPv4 addresses.

