

LINK STATE ROUTING PROTOCOLS

When using a LINK STATE ROUTING PROTOCOL, every ROUTER creates a 'connectivity map' of the NETWORK

To allow this, each ROUTER ADVERTISES information about its INTERFACES (connected NETWORKS) to its NEIGHBOURS. These ADVERTISEMENTS are passed along to the other ROUTERS, until all ROUTERS in the NETWORK develop the same map of the NETWORK

Each ROUTER independently uses this MAP to calculate the BEST ROUTES to each DESTINATION
LINK STATE PROTOCOLS use more resources (CPU) on the ROUTER, because MORE information is shared.

However, LINK STATE PROTOCOLS tend to be FASTER in reacting to CHANGES in the NETWORK than DISTANCES VECTOR PROTOCOLS
BASIC OSPF OPERATIONS

Stands for Open Shortest Path First
Uses the Shortest Path First algorithm
Created by Dutch comp. scientist - Edsger Dijkstra
aka Dijkstra's Algorithm (Could be Exam Question)

THREE Versions:

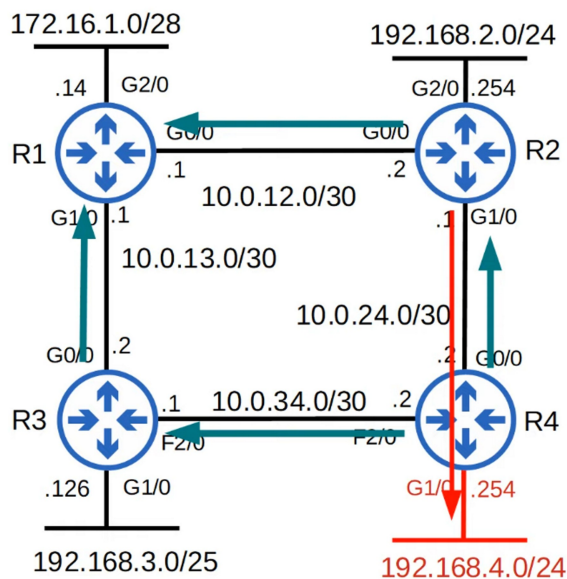
OSPFv1 (1989) : OLD, not in use anymore

OSPFv2 (1998) : Used for IPv4

OSPFv3 (2008) : Used for IPv6 (can be used for IPv4, but v2 is usually used)

Routers store information about the NETWORK in LSAs (Link State Advertisements), which are organized in a structure called the LSDB (Link State Database)

Routers will FLOOD LSAs until all ROUTERS in the OSPF area develop the same map of the network (LSDB)



- OSPF is enabled on R4's G1/0 interface.
- R4 creates an LSA to tell its neighbors about the network on G1/0.
- The LSA is flooded throughout the network until all routers have received it.
- This results in all routers sharing the same LSDB.
- Each router then uses the SPF algorithm to calculate its best route to 192.168.4.0/24.

LSDB

LSA	LSA	LSA	LSA
LSA	LSA	LSA	LSA

LSA
RID: 4.4.4.4
IP: 192.168.4.0/24
Cost: 1

LSA's have an AGING TIMER of 30 Minutes, by Default). The LSA will be FLOODED again after the timer expires

In OSPF, there are THREE MAIN STEPS in the process of sharing LSAs and determining the BEST ROUTE to each DESTINATION in the network

BECOME NEIGHBORS with other ROUTERS connected to same SEGMENT

EXCHANGE LSAs with neighbor ROUTERS

CALCULATE THE BEST ROUTES to each DESTINATION, and insert them into the ROUTING TABLE