OSPF Tutorial

December 3rd, 2010 Go to comments

There are 3 type of tables

+ Neighbor

+ Topology

+ Routing

Neighbor table

+ Contain information about the neighbors

+ Neighbor is a router which shares a link on same network

+ Another relationship is adjacency

+ Not necessarily all neighbors

+ LSA updates are only when adjacency is established

Topology table

+ Contain information about all network and path to reach any network

+ All LSA's are entered into the topology table

+ When topology changes LSA's are generated and send new LSA's

+ On topology table an algorithm is run to create a shortest path, this algorithm is known as SPF or dijkstra algorithm

Routing Table

+ Also knows as forwarding database

+ Generated when an algorithm is run on the topology database

+ Routing table for each router is unique

D: Exchange LSDB's list

Neighbors use DD (Data Description) to exchange their LSDB catalogs. In this scenario, R1 sends DD to R2 first. It says: I have a Route LSA from R1. R2 also sends DD to R1: I have a Route LSA from R2.

Note: DD works like table fo content. It lists what LSDB has, but not details. By reading DD, the receiving router can determine what it is missing and them ask the sender to transmit required LSAs..

R1 Request, R2 Update

R1 has learned that R2 has a R2 Router LSA that it does not have.

R1 sends a LS Request to R2. When R2 receives this request, it sends an Update to transmit this LSA to R1.

R2 Request, R1 Update

R2 also sends request to R1. R1 replies an Update. Upon receiving Update, R2 adds R1 Router LSA to its LSDB, calculates its routes, and add a new entry (192.168.1.0, S1/0) to its routing tabe.

Note: OSPF works distributely. After routers have synchronized their LSDB, they use the same data (LSDB) to calculate shortest paths, and updates their routing tables independently.

Ack update : LSAs are received

In order to assure reliable transmission, when a router receives an Update, it sends an Ack to the Update sender. If the sender does not receivie Ack within a specific peried, it times out and retransmits Update.

Note: OSPF uses Update-Ack to implemnet relaible transmission. It does not use TCP.

H1 ping H2: succeeded.

Each OSPF router creates a Router LSA to describe its interfaces' IP addresses and floods its Router LSA to its neighbors. After a few rounds of flooding, all OSPF routers have the same set of Router LSAs in their LSDBs. Now routers can use the same LSDB to calculate routes and update routing tables.

From LSDB, a router learns the entire topology: the number of routers being connected. Router interfaces and their IP addresses, interface link costs (OSPF metric). With such detail information, routers are able to calculate routing paths to reach all destinations found in LSDB. For example, in the OSPF basic simulation (see External links), R1's LSDB contains two Router LSAs: – A Router LSA from R1. R1 has two links. Their IP addresses are 192.168.1.0/24,192.168.3.0/30. – A Router LSA from R2. R2 has two links. Their IP addresses are 192.168.2.0/24,192.168.3.0/30. From these LSA, R1 can calculate the routing path to reach remote destination 192.11.68.2.2 and adds an entry (192.168.2.0/24, S1/0) to its routing table.

Pages: 1 2 3
Comments (6) Comments

1. alpholove75
   December 28th, 2019

   Hey Dex,

   Did you take your ICND1 exam on November 16, 2019 ? If yes, how was it ?

2. Calvin
   December 30th, 2019

   Can anyone send me the latest CCNA dump for me at calvinangla(at)hotmail(dot)com

3. ICND 2 Dumps
   February 4th, 2020

   Can someone please send me latest ICND2 dumps in my email najimaji15(at)yahoo(dot)com

4. PASSED CCNA, AGAIN!!
   February 23rd, 2020

   Thanks guys! Just passed my ccna with 910 score, this is the second time I'm using 9tut for CCNA test, will always recommend and use!! Thanks again!!

5. PASSED CCNA, AGAIN!
   February 23rd, 2020

   People please, pay for the premium, you will be happy you did. Don’t ask for dumps randomly, 9tut guys really do their homework to help us out and it works! supported them!

6. Hasan Ghassan
   November 7th, 2020

   Nice Explanation, but I think you forgot to add OSPF configuration commands in this tutorial, it is only theoretical without commands.
   Thanks

Add a Comment
Name

Submit Comment
Subscribe to comments feed
EIGRP Tutorial Configure Static Route – GNS3 Lab

Premium Member Zone

Welcome Gurjeet singh!

- Welcome Premium Member
- CCNA – New Questions Part 5
- CCNA – New Questions Part 6
- CCNA – New Questions Part 7
- CCNA – New Questions Part 8
- CCNA – New Questions Part 9
- Composite Quizzes

- Logout

CCNA 200-301

- Basic Questions
- Topology Architecture Questions
- Cloud & Virtualization Questions
- CDP & LLDP Questions
- Switch Questions
- VLAN & Trunking Questions
- VLAN & Trunking Questions 2
- STP & VTP Questions
- EtherChannel Questions
- TCP & UDP Questions

- IP Address & Subnetting Questions
- IP Routing Questions
- IP Routing Questions 2
- OSPF Questions
- OSPF Questions 2
- EIGRP Questions
- NAT Questions
- NTP Questions
- Syslog Questions
- HSRP Questions
- Access-list Questions
- AAA Questions
- Security Questions
- Security Questions 2
- DAI Questions
- IPv6 Questions
- DNS Questions
- QoS Questions
- Port Security Questions
- Wireless Questions
- Wireless Questions 2
- SDN Questions
- DNA Center Questions
- Drag Drop Questions
- Drag Drop Questions 2
- Drag Drop Questions 3
- VPN Questions
- DHCP Questions
- Automation Questions
- Miscellaneous Questions
- CCNA FAQs & Tips
- Share your new CCNA Experience

CCNA Self-Study

- Practice CCNA GNS3 Labs
- CCNA Knowledge
- CCNA Lab Challenges
- Puppet Tutorial
- Chef Tutorial
- Ansible Tutorial
- JSON Tutorial
- Layer 2 Threats and Security Features
- AAA TACACS+ and RADIUS Tutorial
- STP Root Port Election Tutorial
- GRE Tunnel Tutorial
- Basic MPLS Tutorial
- TCP and UDP Tutorial
- Border Gateway Protocol BGP Tutorial
- Point to Point Protocol (PPP) Tutorial
- WAN Tutorial
- DHCP Tutorial
- Simple Network Management Protocol SNMP Tutorial
- Syslog Tutorial
- Gateway Load Balancing Protocol GLBP Tutorial
- EtherChannel Tutorial
- Hot Standby Router Protocol HSRP Tutorial

- InterVLAN Routing Tutorial
- Cisco Command Line Interface CLI
- Cisco Router Boot Sequence Tutorial
- OSI Model Tutorial
- Subnetting Tutorial – Subnetting Made Easy
- Frame Relay Tutorial
- Wireless Tutorial
- Virtual Local Area Network VLAN Tutorial
- VLAN Trunking Protocol VTP Tutorial
- IPv6 Tutorial
- Rapid Spanning Tree Protocol RSTP Tutorial
- Spanning Tree Protocol STP Tutorial
- Network Address Translation NAT Tutorial
- Access List Tutorial
- RIP Tutorial
- EIGRP Tutorial
- OSPF Tutorial

Network Resources

- Free Router Simulators
  - CCNA Website
  - ENCOR Website
  - ENSDWI Website
  - ENARSI Website
  - DevNet Website
  - CCIE R&S Website
  - Security Website
  - Wireless Website
  - Design Website
  - Data Center Website
  - Service Provider Website
  - Collaboration Website

Top