Cisco CCNA (200-301)

Introducing Single Area OSPFv2

Learning Objective: Configure and verify OSPFv2 for routing

Description: OSPFv2 is the most popularly used routing protocol in business today. You will learn how to configure it for multiple context.

Q: Can you review the OSPF basics?

- Single Area OSPFv2
    - ```
      Link State Overview

      *    Dijkstra-shortest path first algorithm
           *    Bandwidth (Ref Bandwidth/actual Bandwidth)
                +    Traditionally, the ref bw: 100,000,000 bits
                +    e.g. 100,000,000/256,000= ~390
           *    e.g. OSPF (IEEE), IS-IS (ANSI ISO)
           *    AD: 110
                +    not as believable as EIGRP (90)
                +    as believable as RIP (120)
           *    Multicast: 224.0.0.5
      ```

Q: How do OSPF routers share information?

- OSPF routers must become neighbors
  * OSPF neighbors must agree on
  * Subnet and subnet mask
  * Hello timer intervals ("keep alives")--every 10sec
  * Dead timer intervals (if I don't hear from you)-- 4 X Hello timer interval
  * Area number: in single area OSPFv2 the only area number will be 0
  * Area number limits the OSPF info to router interfaces sharing the same area id.
  * to communicate between different areas in multi-area ospf, all traffic will have to be go through area 0.
  * (If used) Authentication must match too on OSPF interfaces

Q: Once they become neighbors what happens next?

- Once neighbors are established, then each OSPF router will build 3 tables:
  * Neighbor Table: List of all OSPF Neighbors
  * Topology Table (LSDB--Link State Database): List of subnets, routers, and links
  * Routing Table: Best route from each router running SPF against LSDB.

Q: Is this all we need to know?

- There are 2 OSPF router states:
    - Multiaccess networks (switches)
        - DR, BDR, DROTHER
    - Point to Point
        - no need for DR and BDR
- Router with highest OSPF Priority sending Hello becomes DR
  If multiple routers have identical priority, then highest RID becomes DR
  Next highest Priority typically becomes the BDR (Backup Designated Router)
  Router with the Priority of 0 will not participate in election
  After DR election, a router with a better priority doesn't
  preempt election but is election for next BDR.

Q: Can you show us?

Outro

Endnotes, external and etc.

3.4 Configure and verify single area OSPFv2

- 3.4.a Neighbor adjacencies
- 3.4.b Point-to-point
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- 3.4.c Broadcast (DR/BDR selection)
- 3.4.d Router ID