OSPF Neighbour Relationships & DR/BDR Election

NULL0LABS

OSPF Neighbour Relationships Overview

- OSPF (Open Shortest Path First) is a link-state routing protocol.
- Routers must form neighbor relationships to exchange routing information.
- Neighbors are discovered using Hello packets.
- Only routers with matching parameters (area ID, subnet mask, Hello/Dead intervals, authentication) become neighbors.

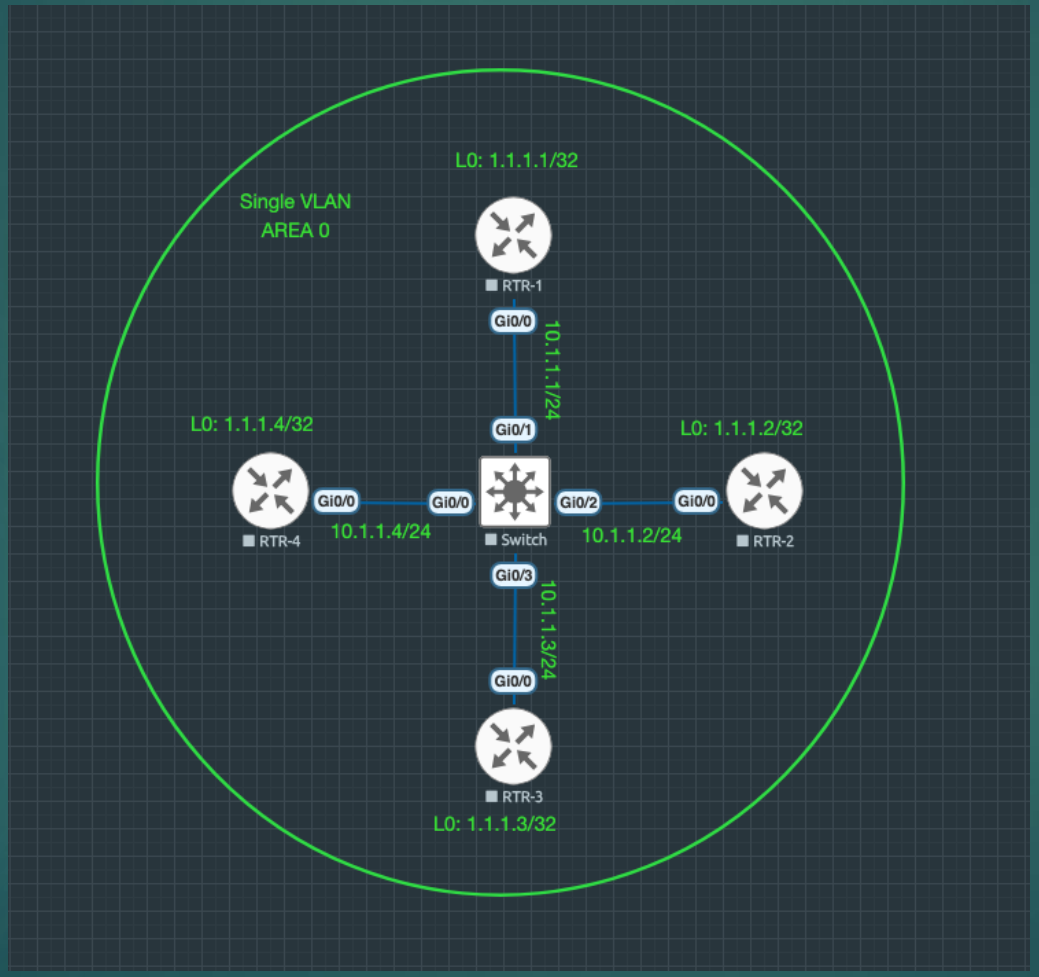
OSPF Neighbour States

- **Down**: No Hello packets received.
- **Init**: Hello packet received from neighbor.
- **2-Way**: Bidirectional communication established.
- **ExStart**: Master/slave roles determined for database exchange.
- **Exchange**: Database Description (DBD) packets exchanged.
- **Loading**: Request and receive missing LSAs.
- **Full**: Databases are synchronized.

DR/BDR Election Process

- On broadcast/non-broadcast multi-access networks, OSPF elects a Designated Router (DR) and Backup Designated Router (BDR).
- Election based on router priority (highest wins); if tied, highest Router ID wins.
- DR reduces OSPF traffic by acting as a central point for LSA exchange.
- BDR takes over if DR fails; other routers are DROthers.

Topology


Single VLAN
AREA 0
L0: 1.1.1.1/32
RTR-1
Gi0/0
10.1.1.1/24
Gi0/1
L0: 1.1.1.4/32
L0: 1.1.1.2/32
Gi0/0
Gi0/0
Gi0/2
Gi0/0
RTR-4
10.1.1.4/24
Switch
10.1.1.2/24
RTR-2
Gi0/3
10.1.1.3/24
Gi0/0
RTR-3
L0: 1.1.1.3/32

Summary

- OSPF neighbor relationships are essential for routing information exchange.
- DR/BDR election optimizes OSPF operations on multi-access networks.
- Understanding these concepts is key for network stability and efficiency.