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| IPv4 BGP in Packet Tracer Lab |  |
|  |  |
|  | 12/7/2020CISCO CCNP |
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Purpose

Set A system of network with 7 routers that has an OSPF, RIP, and BGP protocol running in ipv4. BGP protocol should be in eBGP. There should be three routers running each protocol, and two routers will have two protocol at the same time. Routers should have routes to all other networks, and devices should be able to ping any other device. There should be three routers running in BGP (Extra Credit).

Background Information on Lab Concepts

Open Shortest Path First (OSPF) is a routing protocol for Internet Protocol (IP) networks. OSPF was developed as an alternative for Routing Information Protocol (RIP), for it offers faster convergence and scales to much larger network implementations. OSPF is a link-state routing protocol that uses the concept of areas (a link-state is the status of router interfaces or connecting networks).  A network administrator can divide the routing domain into distinct areas to help control routing update traffic. OSPF version 2 (OSPFv2) is OSPF for IPv4, and OSPF version 3 (OSPFv3) is OSPF for IPv6. OSPFv3 is unable to generate its own router-id, so it needs manual configuration.

Enhanced Interior Gateway Routing Protocol (EIGRP) is an advanced distance-vector routing protocol that is used on a computer network for automating routing decisions and configuration. EIGRP builds its topology table from its neighbor’s advertisements. One advantage of EIGRP is that it uses very low network resources during normal operation, such that only hello packets are transmitted. EIGRP IPv4 and EIGRP IPv6 works in similar models.

Border Gateway Protocol (BGP) is a standardized exterior gateway protocol designed to exchange routing and reachability information between autonomous systems (AS). BGP is used as the routing protocol in the internet, and AS typically belongs to ISPs or government. EBGP is used between autonomous systems. It is used and implemented at the edge or border router that provides inter-connectivity for two or more autonomous system. It functions as the protocol responsible for interconnection of networks from different organizations or the Internet. IBGP is used inside the autonomous systems. It is used to provide information to internal routers having the same AS. It requires all the devices in same autonomous systems to form full mesh topology or either of Route reflectors.

Lab Summary

In packet tracer, I placed 7 CISCO 4321 routers and added NIM-2T module on each one. I connected routers’ serial ports to their neighbors. I set up the OSPfv2 and OSPFv3 protocol on router 5, 6, and 7 by enabling it on the routers and addressing their directly connected networks. Then I set up EIGRP protocol on router 1, 2, and 3 by enabling it on the routers and addressing their directly connected networks. Then I set up BGP protocol on router 3, 4, and 5 by enabling it on the routers and addressing their directly connected networks and neighbors. At last I redistributed protocols on border routers so they can exchange routing information.

Lab Commands

Router (Config) # interface ? ----- enter an interface

Router (Config) # ipv6 unicast-routing ----- enable IPv6 on router

Router (Config-if) # ip address ? subnet-mask ? ----- set ipv4 address on an interface

Router (Config-if) # ipv6 address ? ----- set ipv6 address on an interface

Router (Config-if) # ipv6 address ? link-local ----- set link local address on an interface

Router (Config-if) # ipv6 eigrp ? ----- enable ipv6 EIGRP on an interface

Router (Config-if) # ipv6 ospf ? area ? ----- enable OSPFv3 on an interface

Router (Config) # router ospf ? ----- enable OSPFv2 on router

Router (Config-router) # network ? area ? ----- network statement

Router (Config-router) # redistribute bgp ? metric ? subnets ----- redistribute BGP protocol

Router (Config) # ipv6 router ospf ? ----- enable OSPFv3 on router

Router (Config-router) # router-id ? ----- set router id

Router (Config) # router eigrp ? ----- enable EIGRP on router

Router (Config-router) # network ? ----- network statement

Router (Config-router) # redistribute bgp ? metric ? ----- redistribute BGP protocol

Router (Config) # ipv6 router eigrp ? ----- enable ipv6 EIGRP on router

Router (Config-router) # eigrp router-id ? set router id

Router (Config) # router bgp ? ----- enable BGP on router

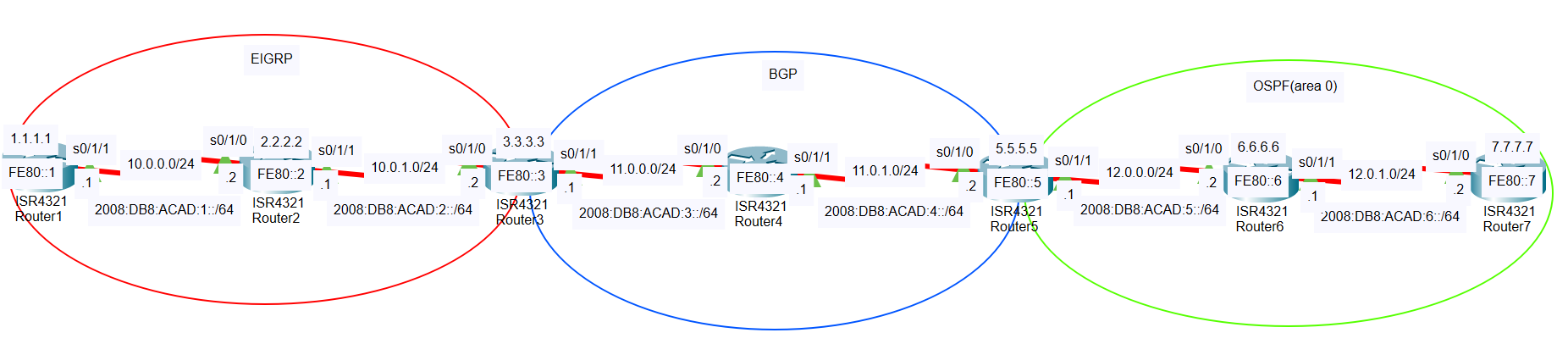
Router (Config-router) # network ? mask ? ----- network statement

Router (Config-router) # neighbor ? remote-as ? ----- set neighbors

Router (Config-router) # redistribute eigrp ? ----- redistribute EIGRP protocol

Router (Config-router) # redistribute ospf ? ----- redistribute OSPF protocol

Network Diagram



Configuration

R1:

*Current configuration : 895 bytes*

*version 15.4*

*no service timestamps log datetime msec*

*no service timestamps debug datetime msec*

*no service password-encryption*

*hostname Router*

*no ip cef*

*ipv6 unicast-routing*

*no ipv6 cef*

*spanning-tree mode pvst*

*interface GigabitEthernet0/0/0*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface GigabitEthernet0/0/1*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface Serial0/1/0*

*no ip address*

*clock rate 2000000*

*shutdown*

*interface Serial0/1/1*

*ip address 10.0.0.1 255.255.255.0*

*ipv6 address FE80::1 link-local*

*ipv6 address 2008:DB8:ACAD:1::1/64*

*ipv6 eigrp 1*

*interface Vlan1*

*no ip address*

*shutdown*

*router eigrp 1*

*network 10.0.0.0*

*ipv6 router eigrp 1*

*eigrp router-id 1.1.1.1*

*shutdown*

*ip classless*

*ip flow-export version 9*

*line con 0*

*line aux 0*

*line vty 0 4*

*login*

*end*

*…..*

*Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP*

*D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area*

*N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2*

*E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP*

*i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area*

*\* - candidate default, U - per-user static route, o - ODR*

*P - periodic downloaded static route*

*Gateway of last resort is not set*

*10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks*

*C 10.0.0.0/24 is directly connected, Serial0/1/1*

*L 10.0.0.1/32 is directly connected, Serial0/1/1*

*D 10.0.1.0/24 [90/2681856] via 10.0.0.2, 07:11:48, Serial0/1/1*

*11.0.0.0/24 is subnetted, 2 subnets*

*D EX 11.0.0.0/24 [170/5241856] via 10.0.0.2, 07:11:48, Serial0/1/1*

*D EX 11.0.1.0/24 [170/5241856] via 10.0.0.2, 07:10:48, Serial0/1/1*

*12.0.0.0/24 is subnetted, 2 subnets*

*D EX 12.0.0.0/24 [170/5241856] via 10.0.0.2, 07:10:47, Serial0/1/1*

*D EX 12.0.1.0/24 [170/5241856] via 10.0.0.2, 07:10:47, Serial0/1/1*

R2:

*Current configuration : 988 bytes*

*version 15.4*

*no service timestamps log datetime msec*

*no service timestamps debug datetime msec*

*no service password-encryption*

*hostname Router*

*no ip cef*

*ipv6 unicast-routing*

*no ipv6 cef*

*spanning-tree mode pvst*

*interface GigabitEthernet0/0/0*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface GigabitEthernet0/0/1*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface Serial0/1/0*

*ip address 10.0.0.2 255.255.255.0*

*ipv6 address FE80::2 link-local*

*ipv6 address 2008:DB8:ACAD:1::2/64*

*ipv6 eigrp 1*

*clock rate 2000000*

*interface Serial0/1/1*

*ip address 10.0.1.1 255.255.255.0*

*ipv6 address FE80::2 link-local*

*ipv6 address 2008:DB8:ACAD:2::1/64*

*ipv6 eigrp 1*

*interface Vlan1*

*no ip address*

*shutdown*

*router eigrp 1*

*network 10.0.0.0*

*ipv6 router eigrp 1*

*eigrp router-id 2.2.2.2*

*shutdown*

*ip classless*

*ip flow-export version 9*

*line con 0*

*line aux 0*

*line vty 0 4*

*login*

*end*

…..

Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP

D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2

E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP

i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area

\* - candidate default, U - per-user static route, o - ODR

P - periodic downloaded static route

Gateway of last resort is not set

10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks

C 10.0.0.0/24 is directly connected, Serial0/1/0

L 10.0.0.2/32 is directly connected, Serial0/1/0

C 10.0.1.0/24 is directly connected, Serial0/1/1

L 10.0.1.1/32 is directly connected, Serial0/1/1

11.0.0.0/24 is subnetted, 2 subnets

D EX 11.0.0.0/24 [170/4729856] via 10.0.1.2, 07:16:12, Serial0/1/1

D EX 11.0.1.0/24 [170/4729856] via 10.0.1.2, 07:15:12, Serial0/1/1

12.0.0.0/24 is subnetted, 2 subnets

D EX 12.0.0.0/24 [170/4729856] via 10.0.1.2, 07:15:11, Serial0/1/1

D EX 12.0.1.0/24 [170/4729856] via 10.0.1.2, 07:15:11, Serial0/1/1

R3:

*Current configuration : 1176 bytes*

*version 15.4*

*no service timestamps log datetime msec*

*no service timestamps debug datetime msec*

*no service password-encryption*

*hostname Router*

*no ip cef*

*ipv6 unicast-routing*

*no ipv6 cef*

*spanning-tree mode pvst*

*interface GigabitEthernet0/0/0*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface GigabitEthernet0/0/1*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface Serial0/1/0*

*ip address 10.0.1.2 255.255.255.0*

*ipv6 address FE80::3 link-local*

*ipv6 address 2008:DB8:ACAD:2::2/64*

*ipv6 eigrp 1*

*clock rate 2000000*

*interface Serial0/1/1*

*ip address 11.0.0.1 255.255.255.0*

*ipv6 address FE80::3 link-local*

*ipv6 address 2008:DB8:ACAD:3::1/64*

*interface Vlan1*

*no ip address*

*shutdown*

*router eigrp 1*

*redistribute bgp 3 metric 1000000 1000 255 20 4*

*network 10.0.0.0*

*router bgp 3*

*bgp log-neighbor-changes*

*no synchronization*

*neighbor 11.0.0.2 remote-as 4*

*network 11.0.0.0 mask 255.255.255.0*

*redistribute eigrp 1*

*ipv6 router eigrp 1*

*eigrp router-id 3.3.3.3*

*shutdown*

*ip classless*

*ip flow-export version 9*

*line con 0*

*line aux 0*

*line vty 0 4*

*login*

*End*

*.....*

*Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP*

*D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area*

*N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2*

*E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP*

*i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area*

*\* - candidate default, U - per-user static route, o - ODR*

*P - periodic downloaded static route*

*Gateway of last resort is not set*

*10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks*

*D 10.0.0.0/24 [90/2681856] via 10.0.1.1, 07:29:15, Serial0/1/0*

*C 10.0.1.0/24 is directly connected, Serial0/1/0*

*L 10.0.1.2/32 is directly connected, Serial0/1/0*

*11.0.0.0/8 is variably subnetted, 3 subnets, 2 masks*

*C 11.0.0.0/24 is directly connected, Serial0/1/1*

*L 11.0.0.1/32 is directly connected, Serial0/1/1*

*B 11.0.1.0/24 [20/0] via 11.0.0.2, 00:00:00*

*12.0.0.0/24 is subnetted, 2 subnets*

*B 12.0.0.0/24 [20/0] via 11.0.0.2, 00:00:00*

*B 12.0.1.0/24 [20/0] via 11.0.0.2, 00:00:00*

R4:

*Current configuration : 1062 bytes*

*version 15.4*

*no service timestamps log datetime msec*

*no service timestamps debug datetime msec*

*no service password-encryption*

*hostname Router*

*no ip cef*

*ipv6 unicast-routing*

*no ipv6 cef*

*spanning-tree mode pvst*

*interface GigabitEthernet0/0/0*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface GigabitEthernet0/0/1*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface Serial0/1/0*

*ip address 11.0.0.2 255.255.255.0*

*ipv6 address FE80::4 link-local*

*ipv6 address 2008:DB8:ACAD:3::2/64*

*clock rate 2000000*

*interface Serial0/1/1*

*ip address 11.0.1.1 255.255.255.0*

*ipv6 address FE80::4 link-local*

*ipv6 address 2008:DB8:ACAD:4::1/64*

*interface Vlan1*

*no ip address*

*shutdown*

*router bgp 4*

*bgp log-neighbor-changes*

*no synchronization*

*neighbor 11.0.0.1 remote-as 3*

*neighbor 11.0.1.2 remote-as 5*

*network 11.0.0.0 mask 255.255.255.0*

*network 11.0.1.0 mask 255.255.255.0*

*ip classless*

*ip flow-export version 9*

*line con 0*

*line aux 0*

*line vty 0 4*

*login*

*…..*

*Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP*

*D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area*

*N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2*

*E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP*

*i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area*

*\* - candidate default, U - per-user static route, o - ODR*

*P - periodic downloaded static route*

*Gateway of last resort is not set*

*10.0.0.0/24 is subnetted, 2 subnets*

*B 10.0.0.0/24 [20/2681856] via 11.0.0.1, 00:00:00*

*B 10.0.1.0/24 [20/2169856] via 11.0.0.1, 00:00:00*

*11.0.0.0/8 is variably subnetted, 4 subnets, 2 masks*

*C 11.0.0.0/24 is directly connected, Serial0/1/0*

*L 11.0.0.2/32 is directly connected, Serial0/1/0*

*C 11.0.1.0/24 is directly connected, Serial0/1/1*

*L 11.0.1.1/32 is directly connected, Serial0/1/1*

*12.0.0.0/24 is subnetted, 2 subnets*

*B 12.0.0.0/24 [20/64] via 11.0.1.2, 00:00:00*

*B 12.0.1.0/24 [20/128] via 11.0.1.2, 00:00:00*

R5:

*Current configuration : 1211 bytes*

*version 15.4*

*no service timestamps log datetime msec*

*no service timestamps debug datetime msec*

*no service password-encryption*

*hostname Router*

*no ip cef*

*ipv6 unicast-routing*

*no ipv6 cef*

*spanning-tree mode pvst*

*interface GigabitEthernet0/0/0*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface GigabitEthernet0/0/1*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface Serial0/1/0*

*ip address 11.0.1.2 255.255.255.0*

*ipv6 address FE80::5 link-local*

*ipv6 address 2008:DB8:ACAD:4::2/64*

*clock rate 2000000*

*interface Serial0/1/1*

*ip address 12.0.0.1 255.255.255.0*

*ipv6 address FE80::5 link-local*

*ipv6 address 2008:DB8:ACAD:5::1/64*

*ipv6 ospf 1 area 0*

*interface Vlan1*

*no ip address*

*shutdown*

*router ospf 1*

*log-adjacency-changes*

*redistribute bgp 5 metric 4 subnets*

*network 12.0.0.0 0.0.0.255 area 0*

*router bgp 5*

*bgp log-neighbor-changes*

*no synchronization*

*neighbor 11.0.1.1 remote-as 4*

*network 11.0.1.0 mask 255.255.255.0*

*redistribute ospf 1*

*ipv6 router ospf 1*

*router-id 5.5.5.5*

*log-adjacency-changes*

*ip classless*

*ip flow-export version 9*

*line con 0*

*line aux 0*

*line vty 0 4*

*login*

*End*

*…..*

*Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP*

*D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area*

*N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2*

*E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP*

*i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area*

*\* - candidate default, U - per-user static route, o - ODR*

*P - periodic downloaded static route*

*Gateway of last resort is not set*

*10.0.0.0/24 is subnetted, 2 subnets*

*B 10.0.0.0/24 [20/0] via 11.0.1.1, 00:00:00*

*B 10.0.1.0/24 [20/0] via 11.0.1.1, 00:00:00*

*11.0.0.0/8 is variably subnetted, 3 subnets, 2 masks*

*B 11.0.0.0/24 [20/0] via 11.0.1.1, 00:00:00*

*C 11.0.1.0/24 is directly connected, Serial0/1/0*

*L 11.0.1.2/32 is directly connected, Serial0/1/0*

*12.0.0.0/8 is variably subnetted, 3 subnets, 2 masks*

*C 12.0.0.0/24 is directly connected, Serial0/1/1*

*L 12.0.0.1/32 is directly connected, Serial0/1/1*

*O 12.0.1.0/24 [110/128] via 12.0.0.2, 07:35:44, Serial0/1/1*

R6:

*Current configuration : 1077 bytes*

*version 15.4*

*no service timestamps log datetime msec*

*no service timestamps debug datetime msec*

*no service password-encryption*

*hostname Router*

*no ip cef*

*ipv6 unicast-routing*

*no ipv6 cef*

*spanning-tree mode pvst*

*interface GigabitEthernet0/0/0*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface GigabitEthernet0/0/1*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface Serial0/1/0*

*ip address 12.0.0.2 255.255.255.0*

*ipv6 address FE80::6 link-local*

*ipv6 address 2008:DB8:ACAD:5::2/64*

*ipv6 ospf 1 area 0*

*clock rate 2000000*

*interface Serial0/1/1*

*ip address 12.0.1.1 255.255.255.0*

*ipv6 address FE80::6 link-local*

*ipv6 address 2008:DB8:ACAD:6::1/64*

*ipv6 ospf 1 area 0*

*interface Vlan1*

*no ip address*

*shutdown*

*router ospf 1*

*log-adjacency-changes*

*network 12.0.0.0 0.0.0.255 area 0*

*network 12.0.1.0 0.0.0.255 area 0*

*ipv6 router ospf 1*

*router-id 6.6.6.6*

*log-adjacency-changes*

*ip classless*

*ip flow-export version 9*

*line con 0*

*line aux 0*

*line vty 0 4*

*login*

*end*

*…..*

*Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP*

*D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area*

*N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2*

*E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP*

*i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area*

*\* - candidate default, U - per-user static route, o - ODR*

*P - periodic downloaded static route*

*Gateway of last resort is not set*

*10.0.0.0/24 is subnetted, 2 subnets*

*O E2 10.0.0.0/24 [110/4] via 12.0.0.1, 07:40:45, Serial0/1/0*

*O E2 10.0.1.0/24 [110/4] via 12.0.0.1, 07:40:45, Serial0/1/0*

*11.0.0.0/24 is subnetted, 2 subnets*

*O E2 11.0.0.0/24 [110/4] via 12.0.0.1, 07:40:45, Serial0/1/0*

*O E2 11.0.1.0/24 [110/4] via 12.0.0.1, 07:40:45, Serial0/1/0*

*12.0.0.0/8 is variably subnetted, 4 subnets, 2 masks*

*C 12.0.0.0/24 is directly connected, Serial0/1/0*

*L 12.0.0.2/32 is directly connected, Serial0/1/0*

*C 12.0.1.0/24 is directly connected, Serial0/1/1*

*L 12.0.1.1/32 is directly connected, Serial0/1/1*

R7:

*Current configuration : 963 bytes*

*version 15.4*

*no service timestamps log datetime msec*

*no service timestamps debug datetime msec*

*no service password-encryption*

*hostname Router*

*no ip cef*

*ipv6 unicast-routing*

*no ipv6 cef*

*spanning-tree mode pvst*

*interface GigabitEthernet0/0/0*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface GigabitEthernet0/0/1*

*no ip address*

*duplex auto*

*speed auto*

*shutdown*

*interface Serial0/1/0*

*ip address 12.0.1.2 255.255.255.0*

*ipv6 address FE80::7 link-local*

*ipv6 address 2008:DB8:ACAD:6::2/64*

*ipv6 ospf 1 area 0*

*clock rate 2000000*

*interface Serial0/1/1*

*no ip address*

*clock rate 2000000*

*shutdown*

*interface Vlan1*

*no ip address*

*shutdown*

*router ospf 1*

*log-adjacency-changes*

*network 12.0.1.0 0.0.0.255 area 0*

*ipv6 router ospf 1*

*router-id 7.7.7.7*

*log-adjacency-changes*

*ip classless*

*ip flow-export version 9*

*line con 0*

*line aux 0*

*line vty 0 4*

*login*

*end*

*…..*

*Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP*

*D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area*

*N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2*

*E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP*

*i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area*

*\* - candidate default, U - per-user static route, o - ODR*

*P - periodic downloaded static route*

*Gateway of last resort is not set*

*10.0.0.0/24 is subnetted, 2 subnets*

*O E2 10.0.0.0/24 [110/4] via 12.0.1.1, 07:52:39, Serial0/1/0*

*O E2 10.0.1.0/24 [110/4] via 12.0.1.1, 07:52:39, Serial0/1/0*

*11.0.0.0/24 is subnetted, 2 subnets*

*O E2 11.0.0.0/24 [110/4] via 12.0.1.1, 07:52:39, Serial0/1/0*

*O E2 11.0.1.0/24 [110/4] via 12.0.1.1, 07:52:39, Serial0/1/0*

*12.0.0.0/8 is variably subnetted, 3 subnets, 2 masks*

*O 12.0.0.0/24 [110/128] via 12.0.1.1, 07:52:39, Serial0/1/0*

*C 12.0.1.0/24 is directly connected, Serial0/1/0*

*L 12.0.1.2/32 is directly connected, Serial0/1/0*

Problems

When I was setting up redistribution on router 3, 4 and 5, I did not set masks in network statement at first. This caused routers with BGP not able to exchange routing information with other routers with BGP. I fixed this by adding a mask to the network statements. Since there are two networks in BGP, without a mask routers will not be able to distinguish them.

Conclusion

R1:

*Router#ping 12.0.1.0*

*Type escape sequence to abort.*

*Sending 5, 100-byte ICMP Echos to 12.0.1.0, timeout is 2 seconds:*

*!!!!!*

*Success rate is 100 percent (5/5), round-trip min/avg/max = 5/32/52 ms*

*Router#ping 11.0.0.1*

*Type escape sequence to abort.*

*Sending 5, 100-byte ICMP Echos to 11.0.0.1, timeout is 2 seconds:*

*!!!!!*

*Success rate is 100 percent (5/5), round-trip min/avg/max = 2/10/27 ms*

*Router#ping 11.0.0.2*

*Type escape sequence to abort.*

*Sending 5, 100-byte ICMP Echos to 11.0.0.2, timeout is 2 seconds:*

*!!!!!*

*Success rate is 100 percent (5/5), round-trip min/avg/max = 3/12/29 ms*

*Router#ping 11.0.1.1*

*Type escape sequence to abort.*

*Sending 5, 100-byte ICMP Echos to 11.0.1.1, timeout is 2 seconds:*

*!!!!!*

*Success rate is 100 percent (5/5), round-trip min/avg/max = 3/15/38 ms*

*Router#ping 11.0.1.2*

*Type escape sequence to abort.*

*Sending 5, 100-byte ICMP Echos to 11.0.1.2, timeout is 2 seconds:*

*!!!!!*

*Success rate is 100 percent (5/5), round-trip min/avg/max = 4/10/17 ms*

R3:

*BGP table version is 20, local router ID is 11.0.0.1*

*Status codes: s suppressed, d damped, h history, \* valid, > best, i - internal,*

*r RIB-failure, S Stale*

*Origin codes: i - IGP, e - EGP, ? - incomplete*

*Network Next Hop Metric LocPrf Weight Path*

*\*> 10.0.0.0/24 10.0.1.1 0 0 0 3 ?*

*\*> 10.0.1.0/24 0.0.0.0 0 0 32768 i*

*\*> 11.0.0.0/24 0.0.0.0 0 0 32768 i*

*\* 11.0.0.2 0 0 0 4 i*

*\*> 11.0.1.0/24 11.0.0.2 0 0 0 4 i*

*\*> 12.0.0.0/24 11.0.0.2 0 0 0 4 5 ?*

*\*> 12.0.1.0/24 11.0.0.2 0 0 0 4 5 ?*

R4:

*BGP table version is 25, local router ID is 11.0.1.1*

*Status codes: s suppressed, d damped, h history, \* valid, > best, i - internal,*

*r RIB-failure, S Stale*

*Origin codes: i - IGP, e - EGP, ? - incomplete*

*Network Next Hop Metric LocPrf Weight Path*

*\*> 10.0.0.0/24 11.0.0.1 0 0 0 3 ?*

*\*> 10.0.1.0/24 11.0.0.1 0 0 0 3 ?*

*\*> 11.0.0.0/24 0.0.0.0 0 0 32768 i*

*\* 11.0.0.1 0 0 0 3 i*

*\*> 11.0.1.0/24 0.0.0.0 0 0 32768 i*

*\* 11.0.1.2 0 0 0 5 i*

*\*> 12.0.0.0/24 11.0.1.2 0 0 0 5 ?*

*\*> 12.0.1.0/24 11.0.1.2 0 0 0 5 ?*

R5:

*BGP table version is 32, local router ID is 12.0.0.1*

*Status codes: s suppressed, d damped, h history, \* valid, > best, i - internal,*

*r RIB-failure, S Stale*

*Origin codes: i - IGP, e - EGP, ? - incomplete*

*Network Next Hop Metric LocPrf Weight Path*

*\*> 10.0.0.0/24 11.0.1.1 0 0 0 4 3 ?*

*\*> 10.0.1.0/24 11.0.1.1 0 0 0 4 3 ?*

*\*> 11.0.0.0/24 11.0.1.1 0 0 0 4 i*

*\*> 11.0.1.0/24 0.0.0.0 0 0 32768 i*

*\* 11.0.1.1 0 0 0 4 i*

*\*> 12.0.0.0/24 0.0.0.0 0 0 32768 i*

*\* 12.0.0.0 0 0 0 5 ?*

*\*> 12.0.1.0/24 12.0.0.2 0 0 0 5 ?*

All networks are connected to each other. In this lab, I used the concept of OSPF, EIGRP, and BGP routing protocols and redistribution of different routing protocol. The lab took about five hours to complete.