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Lab 4: EBGP

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**Purpose:**

The purpose of this lab is to utilize 3 different routing protocols including OSPF, EIGRP and eBGP. I interconnected 6 routers with each 2 routers using these 3 protocols. Using eBGP allows for more scalability and Autonomous Systems (AS) are easier to manage.

**Background information on lab concepts:**

Border Gateway Protocol (BGP) is the Internet's postal service. When someone places a letter in a mailbox, the Postal Service processes it and determines the most efficient way to send it to its intended destination. If we think of BGP as the Internet's Postal Service, ASes are like individual post office branches. Even if a town has hundreds of mailboxes, the mail in those boxes must first pass through the local post office before being forwarded to another location. Internal routers in an AS are similar to mailboxes. They send their outgoing communications to the AS, which subsequently routes them to their destinations using BGP routing. When someone sends data over the Internet, BGP is in charge of analyzing all of the possible paths for the data to take and selecting the best one, which frequently involves hopping between autonomous systems. External BGP is used to exchange routes and transport traffic across the Internet (eBGP). Internal BGP is an internal variant of BGP that autonomous systems can use to route through their internal networks (iBGP). It's worth noting that using internal BGP isn't a must for using external BGP. To connect the routers on their internal network, autonomous systems can use any of a number of internal protocols.

**Lab Summary:**

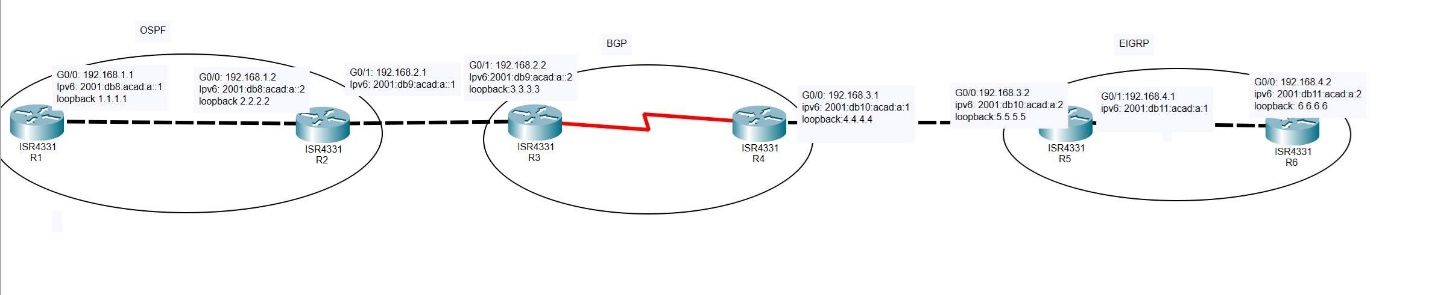
Set up 6 routers, 2 routers are configured with OSPF, 2 routers are connected with EIGRP and the interconnecting router connect both OSPF and EIGRP areas with 2 eBGP routers. On the eBGP routers the serial ports are used. There is only one OSPF area and one EIGRP network.

**Lab Commands**:

router bgp autonomous-system-number

network network-number [mask network-mask ]

**Network Diagram with IP’s:**



**Configurations:**

**R1:**  
**Config:**

Building configuration...

Current configuration : 1579 bytes

Last configuration change at 16:59:59 UTC Tue Feb 1 2022

version 15.5

service timestamps debug datetime msec

service timestamps log datetime msec

no platform punt-keepalive disable-kernel-core

hostname R1

boot-start-marker

boot-end-marker

vrf definition Mgmt-intf

address-family ipv4

exit-address-family

address-family ipv6

exit-address-family

no aaa new-model

ipv6 unicast-routing

subscriber templating

multilink bundle-name authenticated

license udi pid ISR4321/K9 sn FDO214421CF

spanning-tree extend system-id

redundancy

mode none

vlan internal allocation policy ascending

interface Loopback0

ip address 1.1.1.1 255.255.255.255

interface GigabitEthernet0/0/0

ip address 192.168.1.1 255.255.255.0

ip ospf network point-to-point

ip ospf 1 area 1

negotiation auto

ipv6 address 2001:DB8:ACAD:A::1/64

ipv6 enable

ipv6 ospf 1 area 1

interface GigabitEthernet0/0/1

no ip address

negotiation auto

interface Serial0/1/0

no ip address

interface Serial0/1/1

no ip address

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

negotiation auto

interface Vlan1

no ip address

router ospfv3 1

address-family ipv6 unicast

exit-address-family

router ospf 1

network 1.1.1.1 0.0.0.0 area 1

network 192.168.1.0 0.0.0.255 area 1

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

**R2:**

**Config:**

Building configuration...

Current configuration : 1702 bytes

Last configuration change at 17:13:51 UTC Tue Feb 1 2022

version 15.5

service timestamps debug datetime msec

service timestamps log datetime msec

no platform punt-keepalive disable-kernel-core

hostname R2

boot-start-marker

boot-end-marker

vrf definition Mgmt-intf

address-family ipv4

exit-address-family

address-family ipv6

exit-address-family

no aaa new-model

ipv6 unicast-routing

subscriber templating

multilink bundle-name authenticated

license udi pid ISR4321/K9 sn FDO211216BL

spanning-tree extend system-id

redundancy

mode none

vlan internal allocation policy ascending

interface Loopback0

ip address 2.2.2.2 255.255.255.255

interface GigabitEthernet0/0/0

ip address 192.168.1.2 255.255.255.0

ip ospf network point-to-point

ip ospf 1 area 1

negotiation auto

ipv6 address 2001:DB8:ACAD:A::2/64

ipv6 enable

ipv6 ospf 1 area 1

interface GigabitEthernet0/0/1

ip address 192.168.2.1 255.255.255.0

negotiation auto

ipv6 address 2001:DB9:ACAD:A::1/64

ipv6 enable

interface Serial0/1/0

no ip address

interface Serial0/1/1

no ip address

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

negotiation auto

interface Vlan1

no ip address

router ospfv3 1

address-family ipv6 unicast

exit-address-family

router ospf 1

router-id 0.0.0.2

network 2.2.2.0 0.0.0.0 area 1

network 2.2.2.2 0.0.0.0 area 1

network 192.168.1.0 0.0.0.255 area 1

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

**R3:**

**Config:**

Building configuration...

Current configuration : 2157 bytes

Last configuration change at 16:37:23 UTC Tue Nov 9 2021

version 15.5

service timestamps debug datetime msec

service timestamps log datetime msec

no platform punt-keepalive disable-kernel-core

hostname R3

boot-start-marker

boot-end-marker

vrf definition Mgmt-intf

address-family ipv4

exit-address-family

address-family ipv6

exit-address-family

no aaa new-model

ipv6 unicast-routing

subscriber templating

multilink bundle-name authenticated

license udi pid ISR4321/K9 sn FDO21482DWJ

spanning-tree extend system-id

redundancy

mode none

vlan internal allocation policy ascending

interface Loopback0

ip address 3.3.3.3 255.255.255.255

ip ospf network point-to-point

ip ospf 1 area 1

ipv6 address 2001:DB8:ACAD:1::1/64

ipv6 ospf 1 area 1

no shutdown

interface GigabitEthernet0/0/0

ip address 3.3.3.1 255.255.255.252

ip ospf network point-to-point

ip ospf 1 area 1

negotiation auto

ipv6 address 2001:DB8:ACAD:B::1/64

ipv6 ospf 1 area 1

no shutdown

interface GigabitEthernet0/0/1

ip address 5.5.5.1 255.255.255.252

ip ospf network point-to-point

ip ospf 1 area 1

negotiation auto

ipv6 address 2001:DB8:ACAD:C::1/64

ipv6 ospf 1 area 1

no shutdown

interface Serial 0/1/0

ip address 1.1.1.2 255.255.255.252

ipv6 address 2001:DB8:ACAD:A::2/64

ipv6 ospf 1 area 1

no shutdown

interface Serial 0/1/1

no ip address

shutdown

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

interface Vlan1

no ip address

shutdown

router ospf 1

redistribute bgp 2 subnets

router bgp 2

bgp router-id 1.1.1.9

bgp log-neighbor-changes

timers bgp 50 110

neighbor 1.1.1.1 remote-as 3

neighbor 2001:DB8:ACAD:A::1 remote-as 3

address-family ipv4

bgp redistribute-internal

network 1.1.1.0 mask 255.255.255.252

redistribute connected

redistribute ospf 1

neighbor 1.1.1.1 activate

exit-address-family

address-family ipv6

redistribute connected

redistribute ospf 1

neighbor 2001:DB8:ACAD:A::1 activate

exit-address-family

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 1

redistribute bgp 2

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

**R4:**

**Config:**

**R5:**

**Config:**

Building configuration...

Current configuration : 3930 bytes

Last configuration change at 17:34:06 UTC Tue Feb 1 2022

version 16.9

service timestamps debug datetime msec

service timestamps log datetime msec

platform qfp utilization monitor load 80

platform punt-keepalive disable-kernel-core

hostname R5

boot-start-marker

boot-end-marker

vrf definition Mgmt-intf

address-family ipv4

exit-address-family

address-family ipv6

exit-address-family

no aaa new-model

login on-success log

subscriber templating

ipv6 unicast-routing

multilink bundle-name authenticated

crypto pki trustpoint TP-self-signed-2270144787

enrollment selfsigned

subject-name cn=IOS-Self-Signed-Certificate-2270144787

revocation-check none

rsakeypair TP-self-signed-2270144787

crypto pki certificate chain TP-self-signed-2270144787

certificate self-signed 01

30820330 30820218 A0030201 02020101 300D0609 2A864886 F70D0101 05050030

31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D 43657274

69666963 6174652D 32323730 31343437 3837301E 170D3232 30323031 31363234

34395A17 0D333030 31303130 30303030 305A3031 312F302D 06035504 03132649

4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D32 32373031

34343738 37308201 22300D06 092A8648 86F70D01 01010500 0382010F 00308201

0A028201 0100B1AA 808CFF45 66E1132C B6604FCD DC4CCB01 61B16E69 4EA34A76

5B2DF28D AAF88EC1 5CFD7C72 A2212C04 4E74C2C7 E9D0F7CD 04A74CA3 9B39136E

E69D6980 A25303B1 35E9CF86 D0D157BB 2A103F0F 3FB062E6 721E601D 33B4CDF7

0CE63DC3 00662C94 316D39A5 5C885F74 E9AF3C7D 6105BEBF E0F0D3C2 B833022F

717DFD3B 25A91F69 F925736D A2BD340F 96056AE5 A0F3909A 7768293F 590971D5

B81415B1 8E346B98 45876C84 AF7973AB 9BBBBE4F BB877CB9 0189F305 2F94CD16

BA502036 9042E820 05C3752C D2B8ED57 567BED03 FAA6EB99 35370B0A 2C4C5344

A5408E67 FFF1B5E6 FF091663 2092C35C CEB67C65 5714A6A6 9EE97429 1F37D16E

256B452B DFB70203 010001A3 53305130 0F060355 1D130101 FF040530 030101FF

301F0603 551D2304 18301680 14539B86 98B6BEA0 3014E873 E59F6EC8 F87699DA

DD301D06 03551D0E 04160414 539B8698 B6BEA030 14E873E5 9F6EC8F8 7699DADD

300D0609 2A864886 F70D0101 05050003 82010100 42822639 925E8AD8 BE17D2D8

652D46E0 B5172656 8117317D 72761E26 0C2CFA85 6559E0F2 5D6BEAB2 F12E3BEC

66893643 550A065B CCC2710B B5AC7F47 831930A2 AA96481A A4793B05 D95F12C9

8B4BB728 1221002D A25DF280 31FE411F 719334FD 67A8D576 E7F558BD EE6EE3F1

A25192AA 6877194A B69A75C3 9FF131E9 CBD6117E F8D54F6E 3ED10B12 86F0F39E

040F4990 C4F82633 592B2522 373DCAAE AE0034F8 09773CE9 CA5F4152 ED41E096

B6347241 B4903FCA F4E6B23A 4BFF81B0 0C17EAAC D55497B8 C478E695 092F2031

D650DE0F 938877B4 93820EA7 6993C1B8 B78667F4 CC2F71FA 7CF1B1BF ED0C89B6

4CB69C87 EA57DF53 0E2246CC 39FECBBC B5AA2688

quit

license udi pid ISR4321/K9 sn FLM24060912

no license smart enable

diagnostic bootup level minimal

spanning-tree extend system-id

redundancy

mode none

interface Loopback0

ip address 5.5.5.5 255.255.255.255

interface GigabitEthernet0/0/0

ip address 192.168.3.2 255.255.255.0

negotiation auto

ipv6 address 2001:DB10:ACAD:A::2/64

ipv6 enable

ipv6 eigrp 1

interface GigabitEthernet0/0/1

ip address 192.168.4.1 255.255.255.0

negotiation auto

ipv6 address 2001:DB11:ACAD:A::1/64

ipv6 enable

ipv6 eigrp 1

interface GigabitEthernet0/2/0

no ip address

shutdown

negotiation auto

interface GigabitEthernet0/2/1

no ip address

shutdown

negotiation auto

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

router eigrp 1

network 5.5.5.5 0.0.0.0

network 192.168.3.0

network 192.168.4.0

eigrp router-id 0.0.0.5

ip forward-protocol nd

ip http server

ip http authentication local

ip http secure-server

ip tftp source-interface GigabitEthernet0

control-plane

line con 0

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

**R6:**

**Config:**

**Building configuration...**

Current configuration : 3814 bytes

Last configuration change at 16:50:01 UTC Tue Feb 1 2022

version 16.9

service timestamps debug datetime msec

service timestamps log datetime msec

platform qfp utilization monitor load 80

platform punt-keepalive disable-kernel-core

hostname R6

boot-start-marker

boot-end-marker

vrf definition Mgmt-intf

address-family ipv4

exit-address-family

address-family ipv6

exit-address-family

no aaa new-model

login on-success log

subscriber templating

ipv6 unicast-routing

multilink bundle-name authenticated

crypto pki trustpoint TP-self-signed-4144679456

enrollment selfsigned

subject-name cn=IOS-Self-Signed-Certificate-4144679456

revocation-check none

rsakeypair TP-self-signed-4144679456

crypto pki certificate chain TP-self-signed-4144679456

certificate self-signed 01

30820330 30820218 A0030201 02020101 300D0609 2A864886 F70D0101 05050030

31312F30 2D060355 04031326 494F532D 53656C66 2D536967 6E65642D 43657274

69666963 6174652D 34313434 36373934 3536301E 170D3232 30323031 31363330

31315A17 0D333030 31303130 30303030 305A3031 312F302D 06035504 03132649

4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D34 31343436

37393435 36308201 22300D06 092A8648 86F70D01 01010500 0382010F 00308201

0A028201 0100D3BA B4FF2300 E3FEAC3B 63BF3AA4 E5E1E160 EF71F197 E2261CF8

A4028C1B 0CCEDDF7 35588B21 D5CA4277 6F4E156C DFEF979D 0DA07985 7A8D3FBB

D7368F9B 2A8C20DD 5DA016E9 C9FD1E34 6ED3F30A 2D4E0BC0 056F7EE4 0DDEBA25

E273B87D 79538828 3D887C49 31F7C3D8 6CE5201E DE40842A CDCF5886 C939C4AB

1FB9C011 382EB856 F2C34463 8C969E6A 442DF403 6C896EF1 247F72F9 9275E9F7

54189167 9F8BB9DC 18081CD9 2682C262 92823F4D FABF3C66 BE6222F6 2321949C

E0BF196D 12747F24 F86919FC 0799B28D 2E4D52CD 08AE6570 522D77AC 07127909

55DB9312 77DA8E9A 9359D53B FD1C9563 53E340E5 386B33BC 0FAC6219 E7C6F9E1

9D5F8A2C A08D0203 010001A3 53305130 0F060355 1D130101 FF040530 030101FF

301F0603 551D2304 18301680 14340F0E C8830404 3E630106 DEC44CE0 73886048

9D301D06 03551D0E 04160414 340F0EC8 8304043E 630106DE C44CE073 8860489D

300D0609 2A864886 F70D0101 05050003 82010100 83DA167B 843B3793 309710D3

CFB736BA 4E82A7DC B1A5303E C59F8582 C940A479 94024367 121D2998 4B86E01E

67C5D078 76294E21 21C8C806 21E2C520 A079E5BA 99B716F5 F609A53A FC828F53

2525482D BE51A968 FC52757F 4445CA24 A4742440 76F5263E 1DD84930 A0D6983A

C427F7BE 5A45748A C359BC32 D381F2F9 AC7AA061 DEA5EBE9 4E73CD54 D3D969C3

9C465114 5BE29F5D FE798126 58522997 8E11A49A 6336D582 05F6BF61 3FFA275C

8B2F6749 216339EB 8BC8BE7A 28A5CF70 D28186B9 B0B6BF69 525C0220 D2D5291B

B587BF0F FAE806F3 AB1E7F17 593B8704 8823F6C3 F8CBAEA6 D2008F91 7AE7D5F2

26C3088A C771213F 2324B13E 707AEA23 1FF2BA10

quit

license udi pid ISR4321/K9 sn FLM2408005M

no license smart enable

diagnostic bootup level minimal

spanning-tree extend system-id

redundancy

mode none

interface Loopback0

ip address 6.6.6.6 255.255.255.255

interface GigabitEthernet0/0/0

ip address 192.168.4.2 255.255.255.0

negotiation auto

ipv6 address 2001:DB11:ACAD:A::2/64

ipv6 enable

ipv6 eigrp 1

interface GigabitEthernet0/0/1

no ip address

negotiation auto

interface GigabitEthernet0/2/0

no ip address

shutdown

interface GigabitEthernet0/2/1

no ip address

shutdown

negotiation auto

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

router eigrp 1

network 6.0.0.0

network 192.168.4.0

eigrp router-id 0.0.0.6

ip forward-protocol nd

ip http server

ip http authentication local

ip http secure-server

ip tftp source-interface GigabitEthernet0

control-plane

line con 0

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

**Ip routes:**

R6#sh ip route

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

i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP

a - application route

+ - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

1.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

D EX 1.1.1.0/30 [170/256512] via 6.6.6.1, 00:08:37, GigabitEthernet0/0/1

D EX 1.1.1.5/32 [170/256512] via 6.6.6.1, 00:08:35, GigabitEthernet0/0/1

2.0.0.0/30 is subnetted, 1 subnets

D 2.2.2.4 [90/130816] via 6.6.6.1, 00:52:17, GigabitEthernet0/0/1

3.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

D EX 3.3.3.0/30 [170/256512] via 6.6.6.1, 00:08:35, GigabitEthernet0/0/1

D EX 3.3.3.5/32 [170/256512] via 6.6.6.1, 00:08:35, GigabitEthernet0/0/1

4.0.0.0/30 is subnetted, 2 subnets

D 4.4.4.0 [90/3072] via 6.6.6.1, 00:52:17, GigabitEthernet0/0/1

D 4.4.4.4 [90/131072] via 6.6.6.1, 00:52:17, GigabitEthernet0/0/1

5.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

D EX 5.5.5.0/30 [170/256512] via 6.6.6.1, 00:08:35, GigabitEthernet0/0/1

D EX 5.5.5.5/32 [170/256512] via 6.6.6.1, 00:08:35, GigabitEthernet0/0/1

6.0.0.0/8 is variably subnetted, 4 subnets, 2 masks

C 6.6.6.0/30 is directly connected, GigabitEthernet0/0/1

L 6.6.6.2/32 is directly connected, GigabitEthernet0/0/1

C 6.6.6.4/30 is directly connected, Loopback0

L 6.6.6.5/32 is directly connected, Loopback0

**Ipv6:**

R6#sh ipv6 route

IPv6 Routing Table - default - 14 entries

Codes: C - Connected, L - Local, S - Static, U - Per-user Static route

B - BGP, R - RIP, I1 - ISIS L1, I2 - ISIS L2

IA - ISIS interarea, IS - ISIS summary, D - EIGRP, EX - EIGRP external

ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect

O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2

ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, a - Application

EX 2001:DB8:ACAD:1::/64 [170/26112]

via FE80::B6A8:B9FF:FE01:B991, GigabitEthernet0/0/1

D 2001:DB8:ACAD:2::/64 [90/130816]

via FE80::B6A8:B9FF:FE01:B991, GigabitEthernet0/0/1

EX 2001:DB8:ACAD:3::1/128 [170/26112]

via FE80::B6A8:B9FF:FE01:B991, GigabitEthernet0/0/1

D 2001:DB8:ACAD:4::/64 [90/131072]

via FE80::B6A8:B9FF:FE01:B991, GigabitEthernet0/0/1

EX 2001:DB8:ACAD:5::1/128 [170/26112]

via FE80::B6A8:B9FF:FE01:B991, GigabitEthernet0/0/1

C 2001:DB8:ACAD:6::/64 [0/0]

via Loopback0, directly connected

L 2001:DB8:ACAD:6::1/128 [0/0]

via Loopback0, receive

D 2001:DB8:ACAD:A::/64 [90/1792256]

via FE80::B6A8:B9FF:FE01:B991, GigabitEthernet0/0/1

EX 2001:DB8:ACAD:B::/64 [170/26112]

via FE80::B6A8:B9FF:FE01:B991, GigabitEthernet0/0/1

EX 2001:DB8:ACAD:C::/64 [170/26112]

via FE80::B6A8:B9FF:FE01:B991, GigabitEthernet0/0/1

D 2001:DB8:ACAD:E::/64 [90/3072]

via FE80::B6A8:B9FF:FE01:B991, GigabitEthernet0/0/1

C 2001:DB8:ACAD:F::/64 [0/0]

via GigabitEthernet0/0/1, directly connected

L 2001:DB8:ACAD:F::2/128 [0/0]

via GigabitEthernet0/0/1, receive

L FF00::/8 [0/0]

via Null0, receive

**R4:**

R4#sh ip route

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

i - IS-IS, su - IS-IS summary, 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, H - NHRP, l - LISP

a - application route

+ - replicated route, % - next hop override, p - overrides from PfR

Gateway of last resort is not set

1.0.0.0/8 is variably subnetted, 3 subnets, 2 masks

C 1.1.1.0/30 is directly connected, Serial0/1/0

L 1.1.1.1/32 is directly connected, Serial0/1/0

B 1.1.1.5/32 [20/0] via 1.1.1.2, 00:12:48

2.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

C 2.2.2.4/30 is directly connected, Loopback0

L 2.2.2.5/32 is directly connected, Loopback0

3.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

B 3.3.3.0/30 [20/0] via 1.1.1.2, 00:12:48

B 3.3.3.5/32 [20/2] via 1.1.1.2, 00:12:48

4.0.0.0/8 is variably subnetted, 3 subnets, 2 masks

C 4.4.4.0/30 is directly connected, GigabitEthernet0/0/0

L 4.4.4.1/32 is directly connected, GigabitEthernet0/0/0

D 4.4.4.4/30 [90/130816] via 4.4.4.2, 00:58:37, GigabitEthernet0/0/0

5.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

B 5.5.5.0/30 [20/0] via 1.1.1.2, 00:12:48

B 5.5.5.5/32 [20/2] via 1.1.1.2, 00:12:48

6.0.0.0/8 is variably subnetted, 3 subnets, 2 masks

C 6.6.6.0/30 is directly connected, GigabitEthernet0/0/1

L 6.6.6.1/32 is directly connected, GigabitEthernet0/0/1

D 6.6.6.4/30 [90/130816] via 6.6.6.2, 00:56:24, GigabitEthernet0/0/1

**Ipv6:**

R6#sh ipv6 route

IPv6 Routing Table - default - 16 entries

Codes: C - Connected, L - Local, S - Static, U - Per-user Static route

B - BGP, R - RIP, I1 - ISIS L1, I2 - ISIS L2

IA - ISIS interarea, IS - ISIS summary, D - EIGRP, EX - EIGRP external

ND - ND Default, NDp - ND Prefix, DCE - Destination, NDr - Redirect

O - OSPF Intra, OI - OSPF Inter, OE1 - OSPF ext 1, OE2 - OSPF ext 2

ON1 - OSPF NSSA ext 1, ON2 - OSPF NSSA ext 2, a - Application

B 2001:DB8:ACAD:1::/64 [20/0]

via FE80::267E:12FF:FE4D:F770, Serial0/1/0

C 2001:DB8:ACAD:2::/64 [0/0]

via Loopback0, directly connected

L 2001:DB8:ACAD:2::1/128 [0/0]

via Loopback0, receive

B 2001:DB8:ACAD:3::1/128 [20/1]

via FE80::267E:12FF:FE4D:F770, Serial0/1/0

D 2001:DB8:ACAD:4::/64 [90/130816]

via FE80::CE7F:76FF:FECE:9BF0, GigabitEthernet0/0/0

B 2001:DB8:ACAD:5::1/128 [20/1]

via FE80::267E:12FF:FE4D:F770, Serial0/1/0

D 2001:DB8:ACAD:6::/64 [90/130816]

via FE80::CE7F:76FF:FEC8:A1F1, GigabitEthernet0/0/1

C 2001:DB8:ACAD:A::/64 [0/0]

via Serial0/1/0, directly connected

L 2001:DB8:ACAD:A::1/128 [0/0]

via Serial0/1/0, receive

B 2001:DB8:ACAD:B::/64 [20/0]

via FE80::267E:12FF:FE4D:F770, Serial0/1/0

B 2001:DB8:ACAD:C::/64 [20/0]

via FE80::267E:12FF:FE4D:F770, Serial0/1/0

C 2001:DB8:ACAD:E::/64 [0/0]

via GigabitEthernet0/0/0, directly connected

L 2001:DB8:ACAD:E::1/128 [0/0]

via GigabitEthernet0/0/0, receive

C 2001:DB8:ACAD:F::/64 [0/0]

via GigabitEthernet0/0/1, directly connected

L 2001:DB8:ACAD:F::1/128 [0/0]

via GigabitEthernet0/0/1, receive

L FF00::/8 [0/0]

via Null0, receive

**Problem Section:**

I had a problem with getting the serial ports to work. After I resolved the bgp issues I started to see all the routes showing up when I did show ip route commands. Another problem I had was some of the interfaces not connecting to one another and I had to do no shutdowns for a lot of them. As this is our first lab using BGP we were getting used to the new configuration. It took us some time but after looking up the BGP configuration on Cisco.com I had an easier time. My eigrp and ospf sides of the topology were mostly problem free other than some ip addressing issues that I ended up resolving. The ip routes also were not showing a lot of connections, and then I later realized that our serial ports were connected the wrong way. After we resolved these issues our lab began pinging correctly and working.

**Conclusion:**

We set up 6 routers to communicate with eigrp, ospf and bgp in between. This was the first lab which utilize 3 different routing protocols. BGP was a new routing protocol that was new to me, so it took some time to understand the new configuration coding.