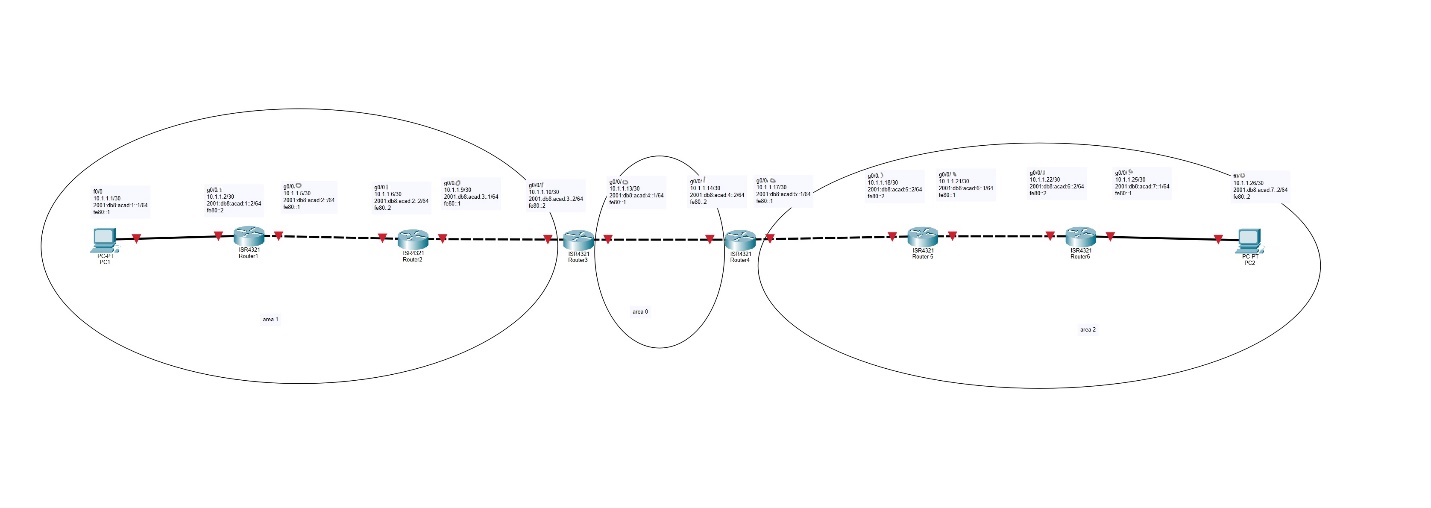
Multi Area OSPF

**Purpose:** The purpose of this lab was to expand our knowledge of OSPF by creating a multiple area network using six different routers. We had to implement both IPv4 and IPv6 on to every router.

Background Information: This lab put all our routers into multiple OSPF areas. Open Shortest Path First is the protocol of finding the shortest path between routers. When it was enabled to allow our routers to form adjacencies with other routers very quickly. This meant that in a short amount of time we were able to communicate across all the routers because of OSPF.

**Lab Summary**: We configured 5 different routers with ipv4 and ipv6 address. We did that this on the g0/0/0 and g0/0/1 interface of the routers. We used the subnet address 255.255.255.252 to create groups of four. We then enabled OSPF on every router and set the process ID number. We then made sure every router had its own router-id number. After that we put every router in its designated area. There were three different areas with the outside ones have three routers each and the middle area have just two routers. We then had to enable OSPF for IPv6 and assign a process-ID. For IPv6 we had to go into each interface and assign an interface to the area it was connected to. This allowed for the routers to form neighbors with each other and thus we now were able to ping throughout the network. From there the routers were able to form neighbors with the routers around them. So, we were able to ping across all the routers.

Network Diagram: 

Config:

Router 1:

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

no ip domain lookup

ipv6 unicast-routing

subscriber templating

multilink bundle-name authenticated

license udi pid ISR4321/K9 sn FDO21482HZX

spanning-tree extend system-id

redundancy

mode none

vlan internal allocation policy ascending

interface GigabitEthernet0/0/0

ip address 10.1.1.5 255.255.255.252

ip ospf 10 area 1

negotiation auto

ipv6 address FE80::1 link-local

ipv6 address 2001:DB8:ACAD:2::1/64

ipv6 ospf 10 area 1

interface GigabitEthernet0/0/1

ip address 10.1.1.2 255.255.255.252

ip ospf 10 area 1

negotiation auto

ipv6 address FE80::2 link-local

ipv6 address 2001:DB8:ACAD:1::2/64

ipv6 ospf 10 area 1

interface Serial0/1/0

no ip address

shutdown

interface Serial0/1/1

no ip address

shutdown

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

interface Vlan1

no ip address

shutdown

router ospf 10

router-id 1.1.1.1

network 10.1.1.0 0.0.0.3 area 1

network 10.1.1.4 0.0.0.3 area 1

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 10

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

IP routes:  
 10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks

C 10.1.1.4/30 is directly connected, GigabitEthernet0/0/0

L 10.1.1.5/32 is directly connected, GigabitEthernet0/0/0

O 10.1.1.8/30 [110/2] via 10.1.1.6, 00:31:16, GigabitEthernet0/0/0

O IA 10.1.1.12/30 [110/3] via 10.1.1.6, 00:25:10, GigabitEthernet0/0/0

O IA 10.1.1.16/30 [110/4] via 10.1.1.6, 00:16:14, GigabitEthernet0/0/0

O IA 10.1.1.20/30 [110/5] via 10.1.1.6, 00:07:33, GigabitEthernet0/0/0

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

via GigabitEthernet0/0/0, directly connected

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

via GigabitEthernet0/0/0, receive

O 2001:DB8:ACAD:3::/64 [110/2]

via FE80::2, GigabitEthernet0/0/0

OI 2001:DB8:ACAD:4::/64 [110/3]

via FE80::2, GigabitEthernet0/0/0

OI 2001:DB8:ACAD:5::/64 [110/4]

via FE80::2, GigabitEthernet0/0/0

OI 2001:DB8:ACAD:6::/64 [110/5]

via FE80::2, GigabitEthernet0/0/0

L FF00::/8 [0/0]

via Null0, receive

Router 2:

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 FDO21482DWJ

spanning-tree extend system-id

redundancy

mode none

vlan internal allocation policy ascending

interface GigabitEthernet0/0/0

ip address 10.1.1.9 255.255.255.252

ip ospf 10 area 1

negotiation auto

ipv6 address FE80::1 link-local

ipv6 address 2001:DB8:ACAD:3::1/64

ipv6 ospf 10 area 1

interface GigabitEthernet0/0/1

ip address 10.1.1.6 255.255.255.252

ip ospf 10 area 1

negotiation auto

ipv6 address FE80::2 link-local

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

ipv6 ospf 10 area 1

interface Serial0/1/0

no ip address

shutdown

interface Serial0/1/1

no ip address

shutdown

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

interface Vlan1

no ip address

shutdown

router ospf 10

router-id 2.2.2.2

network 10.1.1.4 0.0.0.3 area 1

network 10.1.1.8 0.0.0.3 area 1

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 10

router-id 2.2.2.2

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

End

Routes:

10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks

C 10.1.1.4/30 is directly connected, GigabitEthernet0/0/1

L 10.1.1.6/32 is directly connected, GigabitEthernet0/0/1

C 10.1.1.8/30 is directly connected, GigabitEthernet0/0/0

L 10.1.1.9/32 is directly connected, GigabitEthernet0/0/0

O IA 10.1.1.12/30 [110/2] via 10.1.1.10, 00:31:44, GigabitEthernet0/0/0

O IA 10.1.1.16/30 [110/3] via 10.1.1.10, 00:22:47, GigabitEthernet0/0/0

O IA 10.1.1.20/30 [110/4] via 10.1.1.10, 00:14:06, GigabitEthernet0/0/0

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

via GigabitEthernet0/0/1, directly connected

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

via GigabitEthernet0/0/1, receive

C 2001:DB8:ACAD:3::/64 [0/0]

via GigabitEthernet0/0/0, directly connected

L 2001:DB8:ACAD:3::1/128 [0/0]

via GigabitEthernet0/0/0, receive

OI 2001:DB8:ACAD:4::/64 [110/2]

via FE80::2, GigabitEthernet0/0/0

OI 2001:DB8:ACAD:5::/64 [110/3]

via FE80::2, GigabitEthernet0/0/0

OI 2001:DB8:ACAD:6::/64 [110/4]

via FE80::2, GigabitEthernet0/0/0

L FF00::/8 [0/0]

via Null0, receive

Router 3:

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

vtp domain cisco

vtp mode transparent

multilink bundle-name authenticated

license udi pid ISR4321/K9 sn FDO214420HW

spanning-tree extend system-id

redundancy

mode none

vlan internal allocation policy ascending

interface GigabitEthernet0/0/0

ip address 10.1.1.13 255.255.255.252

ip ospf 10 area 0

negotiation auto

ipv6 address FE80::1 link-local

ipv6 address 2001:DB8:ACAD:4::1/64

ipv6 ospf 10 area 0

interface GigabitEthernet0/0/1

ip address 10.1.1.10 255.255.255.252

ip ospf 10 area 1

negotiation auto

ipv6 address FE80::2 link-local

ipv6 address 2001:DB8:ACAD:3::2/64

ipv6 ospf 10 area 1

interface Serial0/1/0

no ip address

shutdown

interface Serial0/1/1

no ip address

shutdown

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

interface Vlan1

no ip address

shutdown

router ospf 10

router-id 3.3.3.3

network 10.1.1.8 0.0.0.3 area 1

network 10.1.1.12 0.0.0.3 area 0

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 10

router-id 3.3.3.3

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

End

Routes:

10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks

O 10.1.1.4/30 [110/2] via 10.1.1.9, 00:33:19, GigabitEthernet0/0/1

C 10.1.1.8/30 is directly connected, GigabitEthernet0/0/1

L 10.1.1.10/32 is directly connected, GigabitEthernet0/0/1

C 10.1.1.12/30 is directly connected, GigabitEthernet0/0/0

L 10.1.1.13/32 is directly connected, GigabitEthernet0/0/0

O IA 10.1.1.16/30 [110/2] via 10.1.1.14, 00:24:12, GigabitEthernet0/0/0

O IA 10.1.1.20/30 [110/3] via 10.1.1.14, 00:15:31, GigabitEthernet0/0/0

O 2001:DB8:ACAD:2::/64 [110/2]

via FE80::1, GigabitEthernet0/0/1

C 2001:DB8:ACAD:3::/64 [0/0]

via GigabitEthernet0/0/1, directly connected

L 2001:DB8:ACAD:3::2/128 [0/0]

via GigabitEthernet0/0/1, receive

C 2001:DB8:ACAD:4::/64 [0/0]

via GigabitEthernet0/0/0, directly connected

L 2001:DB8:ACAD:4::1/128 [0/0]

via GigabitEthernet0/0/0, receive

OI 2001:DB8:ACAD:5::/64 [110/2]

via FE80::2, GigabitEthernet0/0/0

OI 2001:DB8:ACAD:6::/64 [110/3]

via FE80::2, GigabitEthernet0/0/0

L FF00::/8 [0/0]

via Null0, receive

Router 4:

hostname R4

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

vtp domain cisco

vtp mode transparent

multilink bundle-name authenticated

license udi pid ISR4321/K9 sn FDO214421D1

spanning-tree extend system-id

redundancy

mode none

vlan internal allocation policy ascending

interface GigabitEthernet0/0/0

ip address 10.1.1.17 255.255.255.252

ip ospf 10 area 2

negotiation auto

ipv6 address FE80::1 link-local

ipv6 address 2001:DB8:ACAD:5::1/64

ipv6 ospf 10 area 2

interface GigabitEthernet0/0/1

ip address 10.1.1.14 255.255.255.252

ip ospf 10 area 0

negotiation auto

ipv6 address FE80::2 link-local

ipv6 address 2001:DB8:ACAD:4::2/64

ipv6 ospf 10 area 0

interface Serial0/1/0

no ip address

shutdown

interface Serial0/1/1

no ip address

shutdown

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

interface Vlan1

no ip address

shutdown

router ospf 10

router-id 4.4.4.4

network 10.1.1.12 0.0.0.3 area 0

network 10.1.1.16 0.0.0.3 area 2

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 10

router-id 4.4.4.4

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

End

Routes:

10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks

O IA 10.1.1.4/30 [110/3] via 10.1.1.13, 00:25:27, GigabitEthernet0/0/1

O IA 10.1.1.8/30 [110/2] via 10.1.1.13, 00:25:27, GigabitEthernet0/0/1

C 10.1.1.12/30 is directly connected, GigabitEthernet0/0/1

L 10.1.1.14/32 is directly connected, GigabitEthernet0/0/1

C 10.1.1.16/30 is directly connected, GigabitEthernet0/0/0

L 10.1.1.17/32 is directly connected, GigabitEthernet0/0/0

O 10.1.1.20/30 [110/2] via 10.1.1.18, 00:16:37, GigabitEthernet0/0/0

OI 2001:DB8:ACAD:2::/64 [110/3]

via FE80::1, GigabitEthernet0/0/1

OI 2001:DB8:ACAD:3::/64 [110/2]

via FE80::1, GigabitEthernet0/0/1

C 2001:DB8:ACAD:4::/64 [0/0]

via GigabitEthernet0/0/1, directly connected

L 2001:DB8:ACAD:4::2/128 [0/0]

via GigabitEthernet0/0/1, receive

C 2001:DB8:ACAD:5::/64 [0/0]

via GigabitEthernet0/0/0, directly connected

L 2001:DB8:ACAD:5::1/128 [0/0]

via GigabitEthernet0/0/0, receive

O 2001:DB8:ACAD:6::/64 [110/2]

via FE80::2, GigabitEthernet0/0/0

L FF00::/8 [0/0]

via Null0, receive

Router 5:

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

vtp domain cisco

vtp mode transparent

ipv6 unicast-routing

multilink bundle-name authenticated

crypto pki trustpoint TP-self-signed-859896477

enrollment selfsigned

subject-name cn=IOS-Self-Signed-Certificate-859896477

revocation-check none

rsakeypair TP-self-signed-859896477

crypto pki certificate chain TP-self-signed-859896477

certificate self-signed 01

3082032E 30820216 A0030201 02020101 300D0609 2A864886 F70D0101 05050030

30312E30 2C060355 04031325 494F532D 53656C66 2D536967 6E65642D 43657274

69666963 6174652D 38353938 39363437 37301E17 0D323230 39313931 35343133

365A170D 33303031 30313030 30303030 5A303031 2E302C06 03550403 1325494F

532D5365 6C662D53 69676E65 642D4365 72746966 69636174 652D3835 39383936

34373730 82012230 0D06092A 864886F7 0D010101 05000382 010F0030 82010A02

82010100 964E9071 0CDBA2C2 A9A6FB3A 9A6FC955 7DA4A825 8EA34E00 92C890FC

BDAB063C C186A18F EBD20BD2 C52FA353 FD434115 9E19CC62 936EBBCE B6FF31C5

D390A55E CAC5ABBC DF72EEB9 445E3D59 D4DB908B C226310A 837C75C9 AC2A7ABF

ED798560 36E73173 82B38C5F 80F83710 0A5D1123 265AC3D7 9F4BBF27 F245E4F9

A985C579 F8AF5899 6688F4E9 3D8EE460 C91DA978 FB5A7915 24198A48 68E3386E

02EB28CF 802FEF59 0D14D5B8 E8999132 77E7DD45 8E2EC428 DC33A80F 444EA81B

2E55EB74 505CC63F F451522B 59394F99 044D1BBE F067091B FEFCE702 7DB0B7A7

9C52A4A6 80D9CAB8 56F80D90 5FFC36D9 22BFAC86 A34CC5DB E96B7602 D12E4AD3

EFF6CACF 02030100 01A35330 51300F06 03551D13 0101FF04 05300301 01FF301F

0603551D 23041830 1680148F 3DF585B5 0EDDFCD2 1B441749 E0D9FF55 A342B630

1D060355 1D0E0416 04148F3D F585B50E DDFCD21B 441749E0 D9FF55A3 42B6300D

06092A86 4886F70D 01010505 00038201 01008527 4A69845B 556DB647 83B1A4F7

22097E8A 15CF5070 63249DA5 93D8E1AB 045EBADA 952BA7DC FEA2FB73 2C1A6CD9

E9D8856D FBB4B6BE E33FE15C 6D7184C8 959CB7C1 B006D011 4634F7AD 949DC423

DB738ACF FBBCC6ED 55D933EC 0A530674 A5662971 348C8CDA 697F9A9A 65D495BB

5BAF22C6 F00992FB A60F6AE0 04494007 EED8A8A8 161D919B 33C1045B 96626958

F8966D94 6CDE2347 C0AA2985 F2CFCB80 6DE07CE5 CC7DB498 FC479EB2 FFA12A90

C7392F56 3277CA40 2475416E 2C1B32D7 E42BE52E F6850580 EB5822B7 EBC028B5

59EAE5DD CBB99DD2 0D2F8A59 6A7B46D1 5448DC4C F9411B05 CA5B5E8D CF2616D4

6F0CFE8F 41A8B8D2 41C7D3C1 2392B08C 171A

quit

license udi pid ISR4321/K9 sn FLM240608PJ

no license smart enable

diagnostic bootup level minimal

spanning-tree extend system-id

redundancy

mode none

interface GigabitEthernet0/0/0

ip address 10.1.1.21 255.255.255.252

ip ospf 10 area 2

negotiation auto

ipv6 address FE80::1 link-local

ipv6 address 2001:DB8:ACAD:6::1/64

ipv6 ospf 10 area 2

interface GigabitEthernet0/0/1

ip address 10.1.1.18 255.255.255.252

ip ospf 10 area 2

negotiation auto

ipv6 address FE80::2 link-local

ipv6 address 2001:DB8:ACAD:5::2/64

ipv6 ospf 10 area 2

interface GigabitEthernet0/1/0

no ip address

shutdown

negotiation auto

interface GigabitEthernet0/1/1

no ip address

shutdown

negotiation auto

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

router ospf 10

router-id 5.5.5.5

network 10.1.1.16 0.0.0.3 area 2

network 10.1.1.20 0.0.0.3 area 2

ip forward-protocol nd

ip http server

ip http authentication local

ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 10

router-id 5.5.5.5

control-plane

line con 0

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

End

Routes:

10.0.0.0/8 is variably subnetted, 7 subnets, 2 masks

O IA 10.1.1.4/30 [110/4] via 10.1.1.17, 00:18:54, GigabitEthernet0/0/1

O IA 10.1.1.8/30 [110/3] via 10.1.1.17, 00:18:54, GigabitEthernet0/0/1

O IA 10.1.1.12/30 [110/2] via 10.1.1.17, 00:18:54, GigabitEthernet0/0/1

C 10.1.1.16/30 is directly connected, GigabitEthernet0/0/1

L 10.1.1.18/32 is directly connected, GigabitEthernet0/0/1

C 10.1.1.20/30 is directly connected, GigabitEthernet0/0/0

L 10.1.1.21/32 is directly connected, GigabitEthernet0/0/0

OI 2001:DB8:ACAD:2::/64 [110/4]

via FE80::1, GigabitEthernet0/0/1

OI 2001:DB8:ACAD:3::/64 [110/3]

via FE80::1, GigabitEthernet0/0/1

OI 2001:DB8:ACAD:4::/64 [110/2]

via FE80::1, GigabitEthernet0/0/1

C 2001:DB8:ACAD:5::/64 [0/0]

via GigabitEthernet0/0/1, directly connected

L 2001:DB8:ACAD:5::2/128 [0/0]

via GigabitEthernet0/0/1, receive

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

via GigabitEthernet0/0/0, directly connected

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

via GigabitEthernet0/0/0, receive

L FF00::/8 [0/0]

via Null0, receive

Router 6:

Current configuration : 3997 bytes

Last configuration change at 16:05:59 UTC Mon Sep 19 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-4288135047

enrollment selfsigned

subject-name cn=IOS-Self-Signed-Certificate-4288135047

revocation-check none

rsakeypair TP-self-signed-4288135047

crypto pki certificate chain TP-self-signed-4288135047

certificate self-signed 01

30820330 30820218 A0030201 02020101 300D0609 2A864886 F70D0101 05050030

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

69666963 6174652D 34323838 31333530 3437301E 170D3232 30393139 31343333

33305A17 0D333030 31303130 30303030 305A3031 312F302D 06035504 03132649

4F532D53 656C662D 5369676E 65642D43 65727469 66696361 74652D34 32383831

33353034 37308201 22300D06 092A8648 86F70D01 01010500 0382010F 00308201

0A028201 0100A680 C8E580C9 23F8255E AF2C75D6 D4E2A275 B13A6985 800F0770

34263295 EE98DDCE BC7A0BE9 DF06801B 64D61487 22DF1A93 ACB5A30A 194505A7

267149A0 B11C4407 003F0E84 6F0D29C2 01F02884 8F59B0D1 938B75F0 4C74FF08

B9025608 D5ABFDFF 7F55963B BAFB4970 FBB17803 B2192FF8 FEF08202 A7441EF8

27629E69 0753186C C080A5B7 B2FDE508 E1E89F45 860EA0A8 10FED634 9BD7E6DD

FE1096E5 65F220F3 D61BFDD9 E9724EDB 5851E339 F0CFF7F5 5F9DDFED B4343677

2766C39C 4A3E4F44 66307B88 322B8075 58349898 21C79996 6B4369EC 9C52C72F

8A19E9FB E32394D5 F34DB0A3 1D9543E5 054126D8 C736A103 12B9EF5F FE7863AA

EA005E39 8C2D0203 010001A3 53305130 0F060355 1D130101 FF040530 030101FF

301F0603 551D2304 18301680 14811D99 63C6DDA7 FE8CA49C C7F89433 D7631723

45301D06 03551D0E 04160414 811D9963 C6DDA7FE 8CA49CC7 F89433D7 63172345

300D0609 2A864886 F70D0101 05050003 82010100 413407F4 82CB5610 5D0C48DA

123D2066 75C25D9E A6A617DC 5A6F7A42 3825C945 A061833A CBCCE865 EAFC41D0

6AC6D7F7 43584CDC 28E35E64 FC7F08AB 8ADDDF47 7D8447E5 040EC0A9 0EAB5547

95ECB7A4 49E66F96 97DD9B8D 567C861D 182CE682 8D817D69 F35DA044 07CF8876

C63F19B7 11411111 D427CC6A C3D3823A 67769506 07A02894 9F4C8E2E DBDEFE9A

06B07890 8D9073AD AF259075 A22B04A1 05C1C3AF 77C3361F 00F71909 BDA9879F

2FD6B35E 9EC1B9CB 6B92DD1A C477038C 301C1F76 CB02122A 9D4E796D A611CBC7

C92D68A4 DA41A4E0 FD50580E 330DC5D1 E547891B 7904E32E FAFE1872 F3DD8CE1

6F6DB45E 067E2F67 5FA1158D 61D381A9 084A5762

quit

license udi pid ISR4321/K9 sn FLM2406090M

no license smart enable

diagnostic bootup level minimal

spanning-tree extend system-id

redundancy

mode none

interface GigabitEthernet0/0/0

ip address 10.1.1.25 255.255.255.252

ip ospf 10 area 2

negotiation auto

ipv6 address FE80::1 link-local

ipv6 address 2001:DB8:ACAD:7::1/64

ipv6 ospf 10 area 1

interface GigabitEthernet0/0/1

ip address 10.1.1.22 255.255.255.252

ip ospf 10 area 2

negotiation auto

ipv6 address FE80::2 link-local

ipv6 address 2001:DB8:ACAD:6::2/64

ipv6 ospf 10 area 2

interface GigabitEthernet0/1/0

no ip address

shutdown

negotiation auto

interface GigabitEthernet0/1/1

no ip address

shutdown

negotiation auto

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

shutdown

negotiation auto

router ospf 10

router-id 6.6.6.6

network 10.1.1.20 0.0.0.3 area 2

network 10.1.1.24 0.0.0.3 area 2

ip forward-protocol nd

ip http server

ip http authentication local

ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 10

router-id 6.6.6.6

control-plane

line con 0

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

End

Routes:

10.0.0.0/8 is variably subnetted, 6 subnets, 2 masks

O IA 10.1.1.4/30 [110/5] via 10.1.1.21, 00:22:05, GigabitEthernet0/0/1

O IA 10.1.1.8/30 [110/4] via 10.1.1.21, 00:22:05, GigabitEthernet0/0/1

O IA 10.1.1.12/30 [110/3] via 10.1.1.21, 00:22:05, GigabitEthernet0/0/1

O 10.1.1.16/30 [110/2] via 10.1.1.21, 00:22:05, GigabitEthernet0/0/1

C 10.1.1.20/30 is directly connected, GigabitEthernet0/0/1

L 10.1.1.22/32 is directly connected, GigabitEthernet0/0/1

OI 2001:DB8:ACAD:2::/64 [110/5]

via FE80::1, GigabitEthernet0/0/1

OI 2001:DB8:ACAD:3::/64 [110/4]

via FE80::1, GigabitEthernet0/0/1

OI 2001:DB8:ACAD:4::/64 [110/3]

via FE80::1, GigabitEthernet0/0/1

O 2001:DB8:ACAD:5::/64 [110/2]

via FE80::1, GigabitEthernet0/0/1

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

via GigabitEthernet0/0/1, directly connected

L 2001:DB8:ACAD:6::2/128 [0/0]

via GigabitEthernet0/0/1, receive

L FF00::/8 [0/0]

via Null0, receive

**Problems:** There was trouble when trying to decide how we would separate the routers into their different areas. We eventually settled on having three different areas. The outside areas would each have three routers while the inside area would only have routers. This meant that the two routers in the middle area would be connect to two different areas. One port would be connected to an outside area while the other was connected to the middle area. We had to make sure we were correctly assigning the area number for out network statements. That gave us some trouble initially but once we noticed it was a simple fix.

**Conclusion:** In conclusion we were able to use very similar configuration as we did in the OSPF single are lab to create a multi area network. That network had three different OSPF areas and there were six different routers all configured with Ipv4 and Ipv6. After OSPF was enabled, they were able to communicate across the network. This would be an effective technique especially for larger networks were having all the routers in the same network would be inconvenient.

Teacher Signoff: