Multi-Area OSPF Lab

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# Purpose

The purpose of this lab is to configure networks consisting of multiple routers that can communicate with each other efficiently even when not directly connected to one another, using OSPF. The 5 routers in the topology are split into 3 areas.

# Background Information

OSPF (Open Shortest Path First) is a protocol used to determine the best path for a packet to travel through a topology, called routing, from one device to another by automatically broadcasting routes across a network. It does this automatically and is used instead of static routes, which take large amounts of time on larger networks and requires maintenance whenever changes are made, whereas OSPF requires far less reconfiguration. OSPF has two versions that are mainly used: OSPFv2 for IPv4 routing and OSPFv3 for IPv6 routing. Multi-area OSPF splits networks into different areas, all connected to a single backbone area, which splits networks to reduce processing power needed because of the smaller routing tables and reduced SPF (Shortest Path First) calculations, which find the shortest path to a destination, since changes made within an area only need to be communicated to other devices in that area and the ABR (Area Boundary Router) connected to that area, which is in the backbone area. In other words, each area can be thought of as a building. These buildings can communicate amongst themselves without help, but to communicate with other buildings, they must go through a special building, which is equivalent to the backbone area, and this special building will relay the information to the desired building. Because the special building manages “interbuilding” communication, if a change is made within a building, only that building and the special building need to make changes instead of every building.

# Lab Summary

We started by drawing out the topology and a routing table for our lab. We were originally going to include hosts, but decided against it as it would be unnecessary. After connecting the 5 routers so that they were connected in a line without the routers at each end connected, we began configuration. We configured hostnames accordingly and enabled IPv6 using the ipv6 unicast-routing command, then began configuring OSPF on each router. We decided to configure OSPF per interface, so inside router ospf 1 and ipv6 router ospf 1 we only configured the router IDs, which were determined by the router’s number repeated 4 times. On the interfaces, we brought their status up using the no shutdown command and configured IP addresses using the ip address <address> <subnet> and the ipv6 address <address> commands. We finally enabled OSPF on these interfaces using the ip ospf 1 area <area id> and the ipv6 ospf 1 area <area id> commands. Finally, we verified connectivity by pinging and tracerouting through the routers and using the show ip route and show ipv6 route commands.

# Lab Commands

hostname <hostname>: Configure hostname

ipv6 unicast-routing: Enable IPv6

router ospf <process id>: Configure OSPF process by entering user into the OSPF router config mode

ipv6 router ospf <process id>: Configure OSPFv3 process by entering user into the OSPF router config mode

router-id <router id>: Sets a router ID to be used by OSPF or BGP processes

interface <interface>: Enter into interface config mode of specified interface

no shutdown: no removes a command from the running config, shutdown is a command that disables function of the interface, so no shutdown reenables function of the interface

ip address <address> <subnet>: Applies specified IPv4 address and subnet mask onto an interface

ipv6 address <address>: Applies specified IPv6 address to an interface

ip ospf <process id> area <area id>: Enables OSPF on an interface using specified process and in specified area

ipv6 ospf <process id> area <area id>: Enables OSPFv3 on an interface using specified process and in specified area

# Network Diagram

A diagram of a router

Description automatically generated

# Configurations

## show run

### Router 1

Current configuration : 1525 bytes

version 15.5

service timestamps debug datetime msec

service timestamps log datetime msec

no platform punt-keepalive disable-kernel-core

hostname JacobAaronR1

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 FDO214421CF

spanning-tree extend system-id

redundancy

mode none

interface GigabitEthernet0/0/0

ip address 192.168.0.3 255.255.255.0

ip ospf 1 area 1

negotiation auto

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

ipv6 ospf 1 area 1

interface GigabitEthernet0/0/1

ip address 192.168.1.1 255.255.255.0

ip ospf 1 area 0

negotiation auto

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

ipv6 ospf 1 area 0

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 ospf 1

router-id 1.1.1.1

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 1

router-id 1.1.1.1

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

### Router 2

Current configuration : 1440 bytes

version 15.5

service timestamps debug datetime msec

service timestamps log datetime msec

no platform punt-keepalive disable-kernel-core

hostname JacobAaronR2

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 GigabitEthernet0/0/0

ip address 192.168.5.1 255.255.255.0

ip ospf 1 area 2

negotiation auto

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

ipv6 ospf 1 area 2

interface GigabitEthernet0/0/1

ip address 192.168.1.2 255.255.255.0

ip ospf 1 area 0

negotiation auto

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

ipv6 ospf 1 area 0

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 ospf 1

router-id 2.2.2.2

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 1

router-id 2.2.2.2

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

### Router 3

Current configuration : 1541 bytes

Last configuration change at 21:00:57 UTC Fri Sep 8 2023

version 15.5

service timestamps debug datetime msec

service timestamps log datetime msec

no platform punt-keepalive disable-kernel-core

hostname AaronJacobR3

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 FDO214420G7

spanning-tree extend system-id

redundancy

mode none

vlan internal allocation policy ascending

interface GigabitEthernet0/0/0

ip address 192.168.5.2 255.255.255.0

ip ospf 1 area 2

negotiation auto

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

ipv6 ospf 1 area 2

interface GigabitEthernet0/0/1

ip address 192.168.2.3 255.255.255.0

ip ospf 1 area 2

negotiation auto

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

ipv6 ospf 1 area 2

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 1

router-id 3.3.3.3

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 1

router-id 3.3.3.3

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

### Router 4

Current configuration : 1762 bytes

Last configuration change at 22:01:22 UTC Thu Sep 7 2023

version 15.5

service timestamps debug datetime msec

service timestamps log datetime msec

no platform punt-keepalive disable-kernel-core

hostname JacobAaronR4

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 FDO21442B21

spanning-tree extend system-id

redundancy

mode none

vlan internal allocation policy ascending

vlan 10

name Microsoft

vlan 20

name Google

interface GigabitEthernet0/0/0

ip address 192.168.4.1 255.255.255.0

negotiation auto

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

interface GigabitEthernet0/0/1

ip address 192.168.2.4 255.255.255.0

ip ospf 1 area 2

negotiation auto

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

ipv6 ospf 1 area 2

interface Serial0/1/0

no ip address

interface Serial0/1/1

no ip address

interface GigabitEthernet0/2/0

no ip address

negotiation auto

interface GigabitEthernet0/2/1

no ip address

negotiation auto

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

negotiation auto

interface Vlan1

no ip address

router ospf 1

router-id 4.4.4.4

passive-interface GigabitEthernet0/0/0

ip forward-protocol nd

no ip http server

no ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 1

router-id 4.4.4.4

passive-interface GigabitEthernet0/0/0

control-plane

line con 0

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

### Router 5

Current configuration : 1647 bytes

Last configuration change at 20:45:00 UTC Fri Sep 8 2023

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 JacobAaronR5

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

license udi pid ISR4321/K9 sn FLM24060912

no license smart enable

diagnostic bootup level minimal

spanning-tree extend system-id

redundancy

mode none

interface GigabitEthernet0/0/0

ip address 192.168.0.2 255.255.255.0

ip ospf 1 area 1

negotiation auto

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

ipv6 ospf 1 area 1

interface GigabitEthernet0/0/1

ip address 192.168.3.1 255.255.255.0

negotiation auto

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

interface GigabitEthernet0/2/0

no ip address

negotiation auto

interface GigabitEthernet0/2/1

no ip address

negotiation auto

interface GigabitEthernet0

vrf forwarding Mgmt-intf

no ip address

negotiation auto

router ospf 1

router-id 5.5.5.5

passive-interface GigabitEthernet0/0/1

ip forward-protocol nd

no ip http server

ip http secure-server

ip tftp source-interface GigabitEthernet0

ipv6 router ospf 1

router-id 5.5.5.5

passive-interface GigabitEthernet0/0/1

control-plane

line con 0

transport input none

stopbits 1

line aux 0

stopbits 1

line vty 0 4

login

end

## show ip(v6) route

### Router 1

JacobAaronR1#show 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

192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.0.0/24 is directly connected, GigabitEthernet0/0/0

L 192.168.0.3/32 is directly connected, GigabitEthernet0/0/0

192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.1.0/24 is directly connected, GigabitEthernet0/0/1

L 192.168.1.1/32 is directly connected, GigabitEthernet0/0/1

O IA 192.168.2.0/24 [110/3] via 192.168.1.2, 00:46:56, GigabitEthernet0/0/1

O IA 192.168.5.0/24 [110/2] via 192.168.1.2, 00:50:30, GigabitEthernet0/0/1

JacobAaronR1#show ipv6 route

IPv6 Routing Table - default - 7 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

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

via GigabitEthernet0/0/0, directly connected

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

via GigabitEthernet0/0/0, receive

C 2001:DB8:ACAD:1::/64 [0/0]

via GigabitEthernet0/0/1, directly connected

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

via GigabitEthernet0/0/1, receive

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

via FE80::2F8:2CFF:FE7F:7191, GigabitEthernet0/0/1

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

via FE80::2F8:2CFF:FE7F:7191, GigabitEthernet0/0/1

L FF00::/8 [0/0]

via Null0, receive

### Router 2

JacobAaronR2#show 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

O IA 192.168.0.0/24 [110/2] via 192.168.1.1, 00:25:11, GigabitEthernet0/0/1

192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.1.0/24 is directly connected, GigabitEthernet0/0/1

L 192.168.1.2/32 is directly connected, GigabitEthernet0/0/1

O 192.168.2.0/24 [110/2] via 192.168.5.2, 00:20:55, GigabitEthernet0/0/0

192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.5.0/24 is directly connected, GigabitEthernet0/0/0

L 192.168.5.1/32 is directly connected, GigabitEthernet0/0/0

JacobAaronR2#show ipv6 route

IPv6 Routing Table - default - 7 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

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

via FE80::B6A8:B9FF:FE47:8E41, GigabitEthernet0/0/1

C 2001:DB8:ACAD:1::/64 [0/0]

via GigabitEthernet0/0/1, directly connected

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

via GigabitEthernet0/0/1, receive

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

via FE80::B6A8:B9FF:FE01:B750, GigabitEthernet0/0/0

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

L FF00::/8 [0/0]

via Null0, receive

### Router 3

AaronJacobR3#show 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

O IA 192.168.0.0/24 [110/3] via 192.168.5.1, 00:49:31, GigabitEthernet0/0/0

O IA 192.168.1.0/24 [110/2] via 192.168.5.1, 00:49:37, GigabitEthernet0/0/0

192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.2.0/24 is directly connected, GigabitEthernet0/0/1

L 192.168.2.3/32 is directly connected, GigabitEthernet0/0/1

192.168.5.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.5.0/24 is directly connected, GigabitEthernet0/0/0

L 192.168.5.2/32 is directly connected, GigabitEthernet0/0/0

AaronJacobR3#show ipv6 route

IPv6 Routing Table - default - 7 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

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

via FE80::2F8:2CFF:FE7F:7190, GigabitEthernet0/0/0

OI 2001:DB8:ACAD:1::/64 [110/2]

via FE80::2F8:2CFF:FE7F:7190, GigabitEthernet0/0/0

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

via GigabitEthernet0/0/1, directly connected

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

via GigabitEthernet0/0/0, receive

L FF00::/8 [0/0]

via Null0, receive

### Router 4

AaronJacobR4#show 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

O IA 192.168.0.0/24 [110/4] via 192.168.2.3, 00:44:34, GigabitEthernet0/0/1

O IA 192.168.1.0/24 [110/3] via 192.168.2.3, 00:44:34, GigabitEthernet0/0/1

192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.2.0/24 is directly connected, GigabitEthernet0/0/1

L 192.168.2.4/32 is directly connected, GigabitEthernet0/0/1

192.168.4.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.4.0/24 is directly connected, GigabitEthernet0/0/0

L 192.168.4.1/32 is directly connected, GigabitEthernet0/0/0

O 192.168.5.0/24 [110/2] via 192.168.2.3, 00:44:34, GigabitEthernet0/0/1

AaronJacobR4#show ipv6 route

IPv6 Routing Table - default - 8 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

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

via FE80::B6A8:B9FF:FE01:B751, GigabitEthernet0/0/1

OI 2001:DB8:ACAD:1::/64 [110/3]

via FE80::B6A8:B9FF:FE01:B751, GigabitEthernet0/0/1

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

via GigabitEthernet0/0/1, directly connected

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

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

via FE80::B6A8:B9FF:FE01:B751, GigabitEthernet0/0/1

L FF00::/8 [0/0]

via Null0, receive

### Router 5

JacobAaronR5#show 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

192.168.0.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.0.0/24 is directly connected, GigabitEthernet0/0/0

L 192.168.0.2/32 is directly connected, GigabitEthernet0/0/0

O IA 192.168.1.0/24 [110/2] via 192.168.0.3, 00:53:35, GigabitEthernet0/0/0

O IA 192.168.2.0/24 [110/4] via 192.168.0.3, 00:44:18, GigabitEthernet0/0/0

192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks

C 192.168.3.0/24 is directly connected, GigabitEthernet0/0/1

L 192.168.3.1/32 is directly connected, GigabitEthernet0/0/1

O IA 192.168.5.0/24 [110/3] via 192.168.0.3, 00:47:51, GigabitEthernet0/0/0

JacobAaronR5#show ipv6 route

IPv6 Routing Table - default - 8 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

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

via GigabitEthernet0/0/0, directly connected

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

via GigabitEthernet0/0/0, receive

OI 2001:DB8:ACAD:1::/64 [110/2]

via FE80::B6A8:B9FF:FE47:8E40, GigabitEthernet0/0/0

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

via FE80::B6A8:B9FF:FE47:8E40, GigabitEthernet0/0/0

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

via GigabitEthernet0/0/1, directly connected

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

via GigabitEthernet0/0/1, receive

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

via FE80::B6A8:B9FF:FE47:8E40, GigabitEthernet0/0/0

L FF00::/8 [0/0]

via Null0, receive

# Problems

We encountered a single problem during the lab caused by lack of knowledge. During our planning, we did not know that area 0 of OSPF was the backbone area that had to be connected to all the other areas to receive OSPF packets, so our topology had the areas numbered left to right from lowest to highest numbers. We fixed this problem by changing the middle area that was connected to the other two areas to area 0, the backbone area, then using area IDs 1 and 2 for the other areas.

# Conclusion

In this lab we set up and configured a topology of routers that used OSPF to be able to find optimal paths for packets to traverse the network. We planned out a diagram of our network on paper with important information such as interface labels and a routing table, then cabled and configured the routers to match the diagram. We made a small mistake in our initial diagram with the area IDs, but this was a simple fix, and overall, this lab helped us rub off some of the rust and get back into the loop of things.

