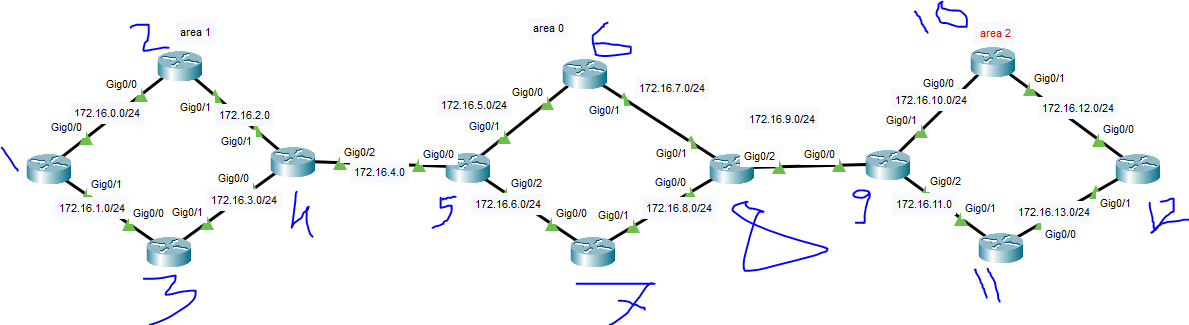
**OSPF**



**Router 1:**

Router(config)#int g0/0

Router(config-if)#ip add 172.16.0.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

Router(config-if)#int g0/1

Router(config-if)#ip add 172.16.1.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#exit

Router(config)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.0.1 YES manual up down

GigabitEthernet0/1 172.16.1.1 YES manual up down

GigabitEthernet0/2 unassigned YES unset administratively down down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router con0 is now available

Press RETURN to get started.

Router>

Router>ena

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.0.0 0.0.0.255 area 1

Router(config-router)#network 172.16.1.0 0.0.0.255 area 1

Router(config-router)#do wr

Building configuration...

[OK]

**Router 2:**

Router(config)#int g0/0

Router(config-if)#ip add 172.16.0.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#

Router(config-if)#int g0/1

Router(config-if)#ip add 172.16.2.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router(config-if)#exit

Router(config)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.0.2 YES manual up up

GigabitEthernet0/1 172.16.2.1 YES manual up down

GigabitEthernet0/2 unassigned YES unset administratively down down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

%IP-4-DUPADDR: Duplicate address 172.16.2.1 on GigabitEthernet0/1, sourced by 0003.E471.4C02

%IP-4-DUPADDR: Duplicate address 172.16.2.1 on GigabitEthernet0/1, sourced by 0003.E471.4C02

Router con0 is now available

Press RETURN to get started.

Router>

Router>ena

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.0.0 0.0.0.255 area 1

Router(config-router)#network 172.16.2.0 0.0.0.255 area 1

Router(config-router)#do wr

00:41:24: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.1.1 on GigabitEthernet0/0 from LOADING to FULL, Loading Done

Building configuration...

[OK]

Router(config-router)#do wr

Building configuration...

**Router 3:**

Router(config)#int g0/0

Router(config-if)#ip add 172.16.1.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#int g0/1

Router(config-if)#ip add 172.16.3.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router(config-if)#

Router(config-if)#exi

Router(config)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.1.2 YES manual up up

GigabitEthernet0/1 172.16.3.1 YES manual up down

GigabitEthernet0/2 unassigned YES unset administratively down down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router con0 is now available

Press RETURN to get started.

Router>

Router>

Router>ena

Router#

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.1.0 0.0.0.255 area 1

Router(config-router)#network 172.16.3.0 0.0.0.255 area 1

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#

00:38:19: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.1.1 on GigabitEthernet0/0 from LOADING to FULL, Loading Done

exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

00:41:02: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.4.1 on GigabitEthernet0/1 from LOADING to FULL, Loading Done

Router con0 is now available

Press RETURN to get started.

Router>

Router>

Router>

Router>ena

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#do 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, 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

172.16.0.0/16 is variably subnetted, 16 subnets, 2 masks

O 172.16.0.0/24 [110/2] via 172.16.1.1, 00:13:48, GigabitEthernet0/0

C 172.16.1.0/24 is directly connected, GigabitEthernet0/0

L 172.16.1.2/32 is directly connected, GigabitEthernet0/0

O 172.16.2.0/24 [110/2] via 172.16.3.2, 00:12:35, GigabitEthernet0/1

C 172.16.3.0/24 is directly connected, GigabitEthernet0/1

L 172.16.3.1/32 is directly connected, GigabitEthernet0/1

O 172.16.4.0/24 [110/2] via 172.16.3.2, 00:11:41, GigabitEthernet0/1

O IA 172.16.5.0/24 [110/3] via 172.16.3.2, 00:09:53, GigabitEthernet0/1

O IA 172.16.6.0/24 [110/3] via 172.16.3.2, 00:09:43, GigabitEthernet0/1

O IA 172.16.7.0/24 [110/4] via 172.16.3.2, 00:08:41, GigabitEthernet0/1

O IA 172.16.8.0/24 [110/4] via 172.16.3.2, 00:07:25, GigabitEthernet0/1

O IA 172.16.9.0/24 [110/5] via 172.16.3.2, 00:05:12, GigabitEthernet0/1

O IA 172.16.10.0/24 [110/6] via 172.16.3.2, 00:03:36, GigabitEthernet0/1

O IA 172.16.11.0/24 [110/6] via 172.16.3.2, 00:03:36, GigabitEthernet0/1

O IA 172.16.12.0/24 [110/7] via 172.16.3.2, 00:02:25, GigabitEthernet0/1

O IA 172.16.13.0/24 [110/7] via 172.16.3.2, 00:01:21, GigabitEthernet0/1

Router(config)#exit

Router#

%SYS-5-CONFIG\_I: Configured from console by console

Router#ping 172.16.12.2

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.16.12.2, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 10/13/20 ms

Router#trace 172.16.12.2

Type escape sequence to abort.

Tracing the route to 172.16.12.2

1 172.16.3.2 1 msec 0 msec 0 msec

2 172.16.4.2 0 msec 0 msec 0 msec

3 172.16.6.2 3 msec 10 msec 10 msec

4 172.16.7.2 3 msec 10 msec 13 msec

5 172.16.9.2 17 msec 10 msec 0 msec

6 172.16.10.2 14 msec 16 msec 15 msec

7 172.16.12.2 13 msec 12 msec 26 msec

**Router 4:**

Router(config)#int g0/1

Router(config-if)#ip add 172.16.2.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

%IP-4-DUPADDR: Duplicate address 172.16.2.1 on GigabitEthernet0/1, sourced by 0050.0F0C.8A02

%IP-4-DUPADDR: Duplicate address 172.16.2.1 on GigabitEthernet0/1, sourced by 0050.0F0C.8A02

Router(config-if)#ip add 172.16.2.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

Router(config-if)#int g0/0

Router(config-if)#ip add 172.16.3.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#int g0/2

Router(config-if)#ip add 172.16.4.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

Router(config-if)#

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router(config-if)#

Router(config-if)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.3.2 YES manual up up

GigabitEthernet0/1 172.16.2.2 YES manual up up

GigabitEthernet0/2 172.16.4.1 YES manual up down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config-if)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up

Router con0 is now available

Press RETURN to get started.

Router>

Router>

Router>ena

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.3.0 0.0.0.255 area 1

Router(config-router)#network 172.16.2.0 0.0.0.255 area 1

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#do w

00:33:56: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.3.1 on GigabitEthernet0/0 from LOADING to FULL, Loading Done

r

Building configuration...

[OK]

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#

00:34:00: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.2.1 on GigabitEthernet0/1 from LOADING to FULL, Loading Done

Router(config-router)#

Router(config-router)#exit

Router(config)#do 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, 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

172.16.0.0/16 is variably subnetted, 8 subnets, 2 masks

O 172.16.0.0/24 [110/2] via 172.16.2.1, 00:00:10, GigabitEthernet0/1

O 172.16.1.0/24 [110/2] via 172.16.3.1, 00:00:10, GigabitEthernet0/0

C 172.16.2.0/24 is directly connected, GigabitEthernet0/1

L 172.16.2.2/32 is directly connected, GigabitEthernet0/1

C 172.16.3.0/24 is directly connected, GigabitEthernet0/0

L 172.16.3.2/32 is directly connected, GigabitEthernet0/0

C 172.16.4.0/24 is directly connected, GigabitEthernet0/2

L 172.16.4.1/32 is directly connected, GigabitEthernet0/2

Router(config)#router ospf 2

Router(config-router)#network 172.16.4.0 0.0.0.255 area 1

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#

00:35:49: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.6.1 on GigabitEthernet0/2 from LOADING to FULL, Loading Done

**Router 5:**

Router(config)#int g0/0

Router(config-if)#ip add 172.16.4.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#int g0/1

Router(config-if)#ip add 172.16.5.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#int g0/2

Router(config-if)#ip add 172.16.6.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router(config-if)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.4.2 YES manual up up

GigabitEthernet0/1 172.16.5.1 YES manual up down

GigabitEthernet0/2 172.16.6.1 YES manual up down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config-if)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up

Router con0 is now available

Press RETURN to get started.

Router>

Router>

Router>ena

Router#

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#router ospf 2

Router(config-router)#network 172.16.4.0 0.0.0.255 area 1

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#

00:32:22: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.4.1 on GigabitEthernet0/0 from LOADING to FULL, Loading Done

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#exit

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.5.0 0.0.0.255 area 0

Router(config-router)#network 172.16.6.0 0.0.0.255 area 0

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

00:34:19: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.7.1 on GigabitEthernet0/1 from LOADING to FULL, Loading Done

00:35:37: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.8.1 on GigabitEthernet0/2 from LOADING to FULL, Loading Done

**Router 6:**

Router(config)#int g0/0

Router(config-if)#ip add 172.16.5.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#int g0/1

Router(config-if)#ip add 172.16.7.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router(config-if)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.5.2 YES manual up up

GigabitEthernet0/1 172.16.7.1 YES manual up down

GigabitEthernet0/2 unassigned YES unset administratively down down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config-if)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router con0 is now available

Press RETURN to get started.

Router>

Router>

Router>

Router>ena

Router#

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.5.0 0.0.0.255 area 0

Router(config-router)#network 172.16.7.0 0.0.0.255 area 0

00:30:53: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.6.1 on GigabitEthernet0/0 from LOADING to FULL, Loading Done

Router(config-router)#network 172.16.7.0 0.0.0.255 area 0

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#

00:33:30: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.9.1 on GigabitEthernet0/1 from LOADING to FULL, Loading Done

**Router 7:**

Router(config)#int g0/0

Router(config-if)#ip add 172.16.6.2

% Incomplete command.

Router(config-if)#ip add 172.16.6.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#int g0/1

Router(config-if)#ip add 172.16.8.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router(config-if)#

Router(config-if)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.6.2 YES manual up up

GigabitEthernet0/1 172.16.8.1 YES manual up down

GigabitEthernet0/2 unassigned YES unset administratively down down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router con0 is now available

Press RETURN to get started.

Router>

Router>

Router>ena

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.8.0 0.0.0.255 area 0

Router(config-router)#network 172.16.6.0 0.0.0.255 area 0

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#

00:30:29: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.6.1 on GigabitEthernet0/0 from LOADING to FULL, Loading Done

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#exit

Router(config)#do wr

Building configuration...

[OK]

**Router 8:**

Router(config)#int g0/1

Router(config-if)#ip add 172.16.7.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router(config-if)#int g0/0

Router(config-if)#ip add 172.16.8.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#

Router(config-if)#int g0/2

Router(config-if)#ip add 172.16.9.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

Router(config-if)#

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router(config-if)#

Router(config-if)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.8.2 YES manual up up

GigabitEthernet0/1 172.16.7.2 YES manual up up

GigabitEthernet0/2 172.16.9.1 YES manual up down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config-if)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up

Router con0 is now available

Press RETURN to get started.

Router>

Router>ena

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.8.0 0.0.0.255 area 0

Router(config-router)#network 172.16.7.0 0.0.0.255 area 0

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#

00:28:34: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.7.1 on GigabitEthernet0/1 from LOADING to FULL, Loading Done

00:28:35: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.8.1 on GigabitEthernet0/0 from LOADING to FULL, Loading Done

Router(config-router)#exit

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.9.0 0.0.0.255 area 2

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

00:30:34: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.11.1 on GigabitEthernet0/2 from LOADING to FULL, Loading Done

**Router 9:**

Router(config)#int g0/0

Router(config-if)#ip add 172.16.9.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#

Router(config-if)#int g0/1

Router(config-if)#ip add 172.16.10.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#

Router(config-if)#int g0/2

Router(config-if)#ip add 172.16.11.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

Router(config-if)#

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.9.2 YES manual up up

GigabitEthernet0/1 172.16.10.1 YES manual up down

GigabitEthernet0/2 172.16.11.1 YES manual up down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/2, changed state to up

Router con0 is now available

Press RETURN to get started.

Router>

Router>

Router>ena

Router#

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.9.0 0.0.0.255 area 2

Router(config-router)#network 172.16.1.0 0.0.0.255 area 2

00:27:54: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.9.1 on GigabitEthernet0/0

Router(config-router)#network 172.16.10.0 0.0.0.255 area 2

Router(config-router)#network 172.16.11.0 0.0.0.255 area 2

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

00:29:21: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.12.1 on GigabitEthernet0/1 from LOADING to FULL, Loading Done

00:30:25: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.13.1 on GigabitEthernet0/2 from LOADING to FULL, Loading Done

**Router 10:**

Router(config)#int g0/0

Router(config-if)#ip add 172.16.10.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#

Router(config-if)#int g0/1

Router(config-if)#ip add 172.16.12.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router(config-if)#

Router(config-if)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

Router(config)#

Router(config)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.10.2 YES manual up up

GigabitEthernet0/1 172.16.12.1 YES manual up down

GigabitEthernet0/2 unassigned YES unset administratively down down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router con0 is now available

Press RETURN to get started.

Router>

Router>

Router>

Router>ena

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.10.0 0.0.0.255 area 2

Router(config-router)#network 172.16.12.0 0.0.0.255 area 2

Router(config-router)#

00:23:50: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.11.1 on GigabitEthernet0/0 from LOADING to FULL, Loading Done

do wr

Building configuration...

[OK]

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

00:25:55: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.13.2 on GigabitEthernet0/1 from LOADING to FULL, Loading Done

**Router 11:**

Router(config)#int g0/1

Router(config-if)#ip add 172.16.11.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router(config-if)#

Router(config-if)#int g0/0

Router(config-if)#ip add 172.16.13.1 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

Router(config-if)#

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

Router(config)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.13.1 YES manual up down

GigabitEthernet0/1 172.16.11.2 YES manual up up

GigabitEthernet0/2 unassigned YES unset administratively down down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config)#

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router con0 is now available

Press RETURN to get started.

Router>

Router>ena

Router#

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.13.0 0.0.0.255 area 2

Router(config-router)#network 172.16.11.0 0.0.0.255 area 2

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#

00:23:05: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.11.1 on GigabitEthernet0/1 from LOADING to FULL, Loading Done

Router(config-router)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

00:24:04: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.13.2 on GigabitEthernet0/0 from LOADING to FULL, Loading Done

**Router 12:**

Router(config)#int g0/0

Router(config-if)#ip add 172.16.12.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#

Router(config-if)#int g0/1

Router(config-if)#ip add 172.16.13.2 255.255.255.0

Router(config-if)#no sh

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1, changed state to up

Router(config-if)#do wr

Building configuration...

[OK]

Router(config-if)#

Router(config-if)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#

Router(config)#do sh ip int br

Interface IP-Address OK? Method Status Protocol

GigabitEthernet0/0 172.16.12.2 YES manual up up

GigabitEthernet0/1 172.16.13.2 YES manual up up

GigabitEthernet0/2 unassigned YES unset administratively down down

Serial0/3/0 unassigned YES unset administratively down down

Serial0/3/1 unassigned YES unset administratively down down

Vlan1 unassigned YES unset administratively down down

Router(config)#

Router con0 is now available

Press RETURN to get started.

Router>

Router>

Router>ena

Router#conf

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#

Router(config)#router ospf 2

Router(config-router)#netw

Router(config-router)#network 172.16.12.0 0.0.0.255 area 2

Router(config-router)#network 172.16.13.0 0.0.0.255 area 2

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#

00:22:13: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.13.1 on GigabitEthernet0/1 from LOADING to FULL, Loading Done

00:22:14: %OSPF-5-ADJCHG: Process 2, Nbr 172.16.12.1 on GigabitEthernet0/0 from LOADING to FULL, Loading Done

Router(config-router)#

Router(config-router)#

Router(config-router)#do wr

Building configuration...

[OK]

Router(config-router)#exit

Router(config)#do wr

Building configuration...

[OK]

Router(config)#do 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, 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

172.16.0.0/16 is variably subnetted, 16 subnets, 2 masks

O IA 172.16.0.0/24 [110/8] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

[110/8] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

O IA 172.16.1.0/24 [110/8] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

[110/8] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

O IA 172.16.2.0/24 [110/7] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

[110/7] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

O IA 172.16.3.0/24 [110/7] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

[110/7] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

O IA 172.16.4.0/24 [110/6] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

[110/6] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

O IA 172.16.5.0/24 [110/5] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

[110/5] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

O IA 172.16.6.0/24 [110/5] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

[110/5] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

O IA 172.16.7.0/24 [110/4] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

[110/4] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

O IA 172.16.8.0/24 [110/4] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

[110/4] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

O 172.16.9.0/24 [110/3] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

[110/3] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

O 172.16.10.0/24 [110/2] via 172.16.12.1, 00:00:15, GigabitEthernet0/0

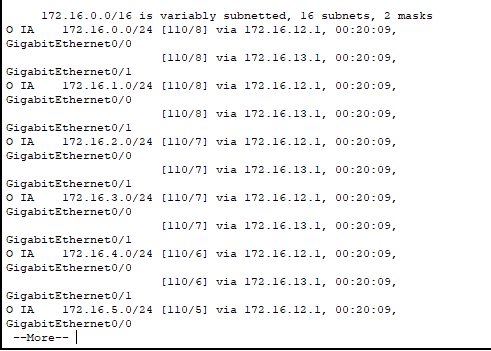
O 172.16.11.0/24 [110/2] via 172.16.13.1, 00:00:15, GigabitEthernet0/1

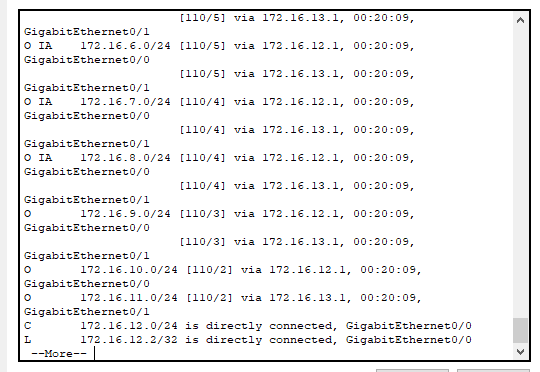
C 172.16.12.0/24 is directly connected, GigabitEthernet0/0

L 172.16.12.2/32 is directly connected, GigabitEthernet0/0

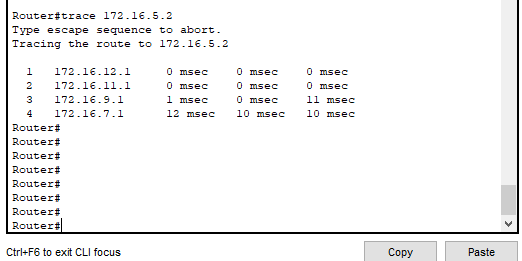
C 172.16.13.0/24 is directly connected, GigabitEthernet0/1

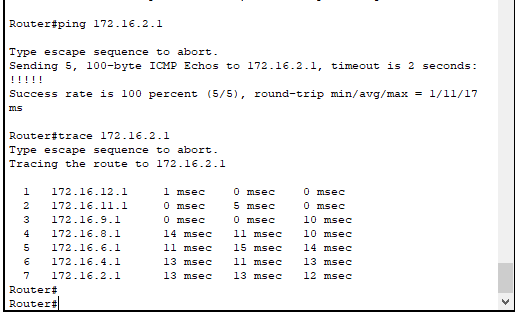
L 172.16.13.2/32 is directly connected, GigabitEthernet0/1

**Routing Table of Router 12:**

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**Trace & ping from Router 12 to different area:**

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