**Data Communication and Computer Networks**

**EEE314**

Lab # 07



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| --- | --- |
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**Lab #07 OSPF Configuration**

**In-Lab Task**

**Task 1**

**Chart

Description automatically generated**

**Graphical user interface, table

Description automatically generated**

**Home Task**

**TASK 1:**

* **Router 0:**

**show running-config:**

Router#show running-config

Building configuration...

Current configuration : 923 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Router

!

!

!

!

!

!

!

!

ip cef

no ipv6 cef

!

!

!

!

!

!

!

!

!

!

!

!

!

!

interface Loopback0

ip address 10.1.1.1 255.255.255.255

!

interface FastEthernet0/0

ip address 172.16.1.17 255.255.255.240

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

duplex auto

speed auto

shutdown

!

interface Serial2/0

ip address 192.168.10.1 255.255.255.252

clock rate 64000

!

interface Serial3/0

ip address 192.168.10.5 255.255.255.252

!

interface FastEthernet4/0

no ip address

shutdown

!

interface FastEthernet5/0

no ip address

shutdown

!

router ospf 1

log-adjacency-changes

network 172.16.1.16 0.0.0.15 area 0

network 192.168.10.0 0.0.0.3 area 0

!

ip classless

!

ip flow-export version 9

!

!

!

!

!

!

!

!

line con 0

!

line aux 0

!

line vty 0 4

login

!

!

!

end

**show ip route:**

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

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

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

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

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

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

P - periodic downloaded static route

Gateway of last resort is not set

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

C 10.1.1.1/32 is directly connected, Loopback0

O 10.10.10.0/24 [110/65] via 192.168.10.2, 00:05:14, Serial2/0

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

C 172.16.1.16/28 is directly connected, FastEthernet0/0

O 172.16.1.32/29 [110/129] via 192.168.10.2, 00:05:04, Serial2/0

192.168.10.0/30 is subnetted, 3 subnets

C 192.168.10.0 is directly connected, Serial2/0

C 192.168.10.4 is directly connected, Serial3/0

O 192.168.10.8 [110/128] via 192.168.10.2, 00:05:14, Serial2/0

**show ip interface brief:**

Router#show ip interface brieg

^

% Invalid input detected at '^' marker.

Router#show ip interface brief

Interface IP-Address OK? Method Status Protocol

FastEthernet0/0 172.16.1.17 YES manual up up

FastEthernet1/0 unassigned YES unset administratively down down

Serial2/0 192.168.10.1 YES manual up up

Serial3/0 192.168.10.5 YES manual up up

FastEthernet4/0 unassigned YES unset administratively down down

FastEthernet5/0 unassigned YES unset administratively down down

Loopback0 10.1.1.1 YES manual up up

**show ip protocol:**

Router#show ip protocol

Routing Protocol is "ospf 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.1.1.1

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

172.16.1.16 0.0.0.15 area 0

192.168.10.0 0.0.0.3 area 0

Routing Information Sources:

Gateway Distance Last Update

10.1.1.1 110 00:06:16

10.2.2.2 110 00:06:16

10.3.3.3 110 00:06:17

Distance: (default is 110)

* **Router 1:**

**show running-config:**

Router#show running-config

Building configuration...

Current configuration : 957 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Router

!

!

!

!

!

!

ip cef

no ipv6 cef

!

!

!

!

!

!

!

!

!

!

!

!

interface Loopback0

ip address 10.2.2.2 255.255.255.255

!

interface FastEthernet0/0

ip address 10.10.10.1 255.255.255.0

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

duplex auto

speed auto

shutdown

!

interface Serial2/0

ip address 192.168.10.2 255.255.255.252

!

interface Serial3/0

ip address 192.168.10.9 255.255.255.252

clock rate 64000

!

interface FastEthernet4/0

no ip address

shutdown

!

interface FastEthernet5/0

no ip address

shutdown

!

router ospf 1

log-adjacency-changes

network 10.10.10.0 0.0.0.255 area 0

network 192.168.10.0 0.0.0.3 area 0

network 192.168.10.8 0.0.0.3 area 0

!

ip classless

!

ip flow-export version 9

!

!

!

!

!

!

!

!

line con 0

!

line aux 0

!

line vty 0 4

login

!

!

!

end

**show ip route:**

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

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

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

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

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

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

P - periodic downloaded static route

Gateway of last resort is not set

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

C 10.2.2.2/32 is directly connected, Loopback0

C 10.10.10.0/24 is directly connected, FastEthernet0/0

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

O 172.16.1.16/28 [110/65] via 192.168.10.1, 00:07:12, Serial2/0

O 172.16.1.32/29 [110/65] via 192.168.10.10, 00:07:12, Serial3/0

192.168.10.0/30 is subnetted, 3 subnets

C 192.168.10.0 is directly connected, Serial2/0

O 192.168.10.4 [110/128] via 192.168.10.10, 00:07:12, Serial3/0

C 192.168.10.8 is directly connected, Serial3/0

**Show ip interface brief:**

Router#show ip interface brief

Interface IP-Address OK? Method Status Protocol

FastEthernet0/0 10.10.10.1 YES manual up up

FastEthernet1/0 unassigned YES unset administratively down down

Serial2/0 192.168.10.2 YES manual up up

Serial3/0 192.168.10.9 YES manual up up

FastEthernet4/0 unassigned YES unset administratively down down

FastEthernet5/0 unassigned YES unset administratively down down

Loopback0 10.2.2.2 YES manual up up

**show ip protocol:**

Router#show ip protocol

Routing Protocol is "ospf 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.2.2.2

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

10.10.10.0 0.0.0.255 area 0

192.168.10.0 0.0.0.3 area 0

192.168.10.8 0.0.0.3 area 0

Routing Information Sources:

Gateway Distance Last Update

10.1.1.1 110 00:08:06

10.2.2.2 110 00:08:06

10.3.3.3 110 00:08:07

Distance: (default is 110)

* **Router 2:**

**Show running-config:**

Router#show running-config

Building configuration...

Current configuration : 960 bytes

!

version 12.2

no service timestamps log datetime msec

no service timestamps debug datetime msec

no service password-encryption

!

hostname Router

!

!

!

!

!

!

!

!

ip cef

no ipv6 cef

!

!

!

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!

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!

!

!

!

interface Loopback0

ip address 10.3.3.3 255.255.255.255

!

interface FastEthernet0/0

ip address 172.16.1.33 255.255.255.248

duplex auto

speed auto

!

interface FastEthernet1/0

no ip address

duplex auto

speed auto

shutdown

!

interface Serial2/0

ip address 192.168.10.6 255.255.255.252

clock rate 64000

!

interface Serial3/0

ip address 192.168.10.10 255.255.255.252

!

interface FastEthernet4/0

no ip address

shutdown

!

interface FastEthernet5/0

no ip address

shutdown

!

router ospf 1

log-adjacency-changes

network 172.16.1.32 0.0.0.7 area 0

network 192.168.10.4 0.0.0.3 area 0

network 192.168.10.8 0.0.0.3 area 0

!

ip classless

!

ip flow-export version 9

!

!

!

!

!

!

!

!

line con 0

!

line aux 0

!

line vty 0 4

login

!

!

!

end

**show ip route:**

Router#show ip route

Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP

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

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

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

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

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

P - periodic downloaded static route

Gateway of last resort is not set

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

C 10.3.3.3/32 is directly connected, Loopback0

O 10.10.10.0/24 [110/65] via 192.168.10.9, 00:08:46, Serial3/0

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

O 172.16.1.16/28 [110/129] via 192.168.10.9, 00:08:36, Serial3/0

C 172.16.1.32/29 is directly connected, FastEthernet0/0

192.168.10.0/30 is subnetted, 3 subnets

O 192.168.10.0 [110/128] via 192.168.10.9, 00:08:46, Serial3/0

C 192.168.10.4 is directly connected, Serial2/0

C 192.168.10.8 is directly connected, Serial3/0

**Show ip interface brief:**

Router#show ip interface brief

Interface IP-Address OK? Method Status Protocol

FastEthernet0/0 172.16.1.33 YES manual up up

FastEthernet1/0 unassigned YES unset administratively down down

Serial2/0 192.168.10.6 YES manual up up

Serial3/0 192.168.10.10 YES manual up up

FastEthernet4/0 unassigned YES unset administratively down down

FastEthernet5/0 unassigned YES unset administratively down down

Loopback0 10.3.3.3 YES manual up up

**show ip protocol:**

Router#show ip protocol

Routing Protocol is "ospf 1"

Outgoing update filter list for all interfaces is not set

Incoming update filter list for all interfaces is not set

Router ID 10.3.3.3

Number of areas in this router is 1. 1 normal 0 stub 0 nssa

Maximum path: 4

Routing for Networks:

172.16.1.32 0.0.0.7 area 0

192.168.10.4 0.0.0.3 area 0

192.168.10.8 0.0.0.3 area 0

Routing Information Sources:

Gateway Distance Last Update

10.1.1.1 110 00:09:24

10.2.2.2 110 00:09:24

10.3.3.3 110 00:09:25

Distance: (default is 110)

## Critical Analysis / Conclusion

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| --- |
| In this lab we learnt about Open shortest path first (OSPF) configuration. It is a classless routing protocol that can be used to provide subnet mask information in the routing updates, this feature of OSPF helps the VLSM subnet information to be available throughout the network.  Moreover, we implemented this on a topology given to us and successfully sent packets between PC’s connected to different routers. |

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| **Lab Assessment** | | |
| **Pre Lab** | **/5** | **/25** |
| **Performance** | **/5** |
| **Results** | **/5** |
| **Viva** | **/5** |
| **Critical Analysis** | **/5** |
| **Instructor Signature and Comments** | | |