

PAF-Karachi Institute of Economics and Technology
College of Computing and Information Sciences - North Campus
Internet & Intranet Architecture
Assignment – 1

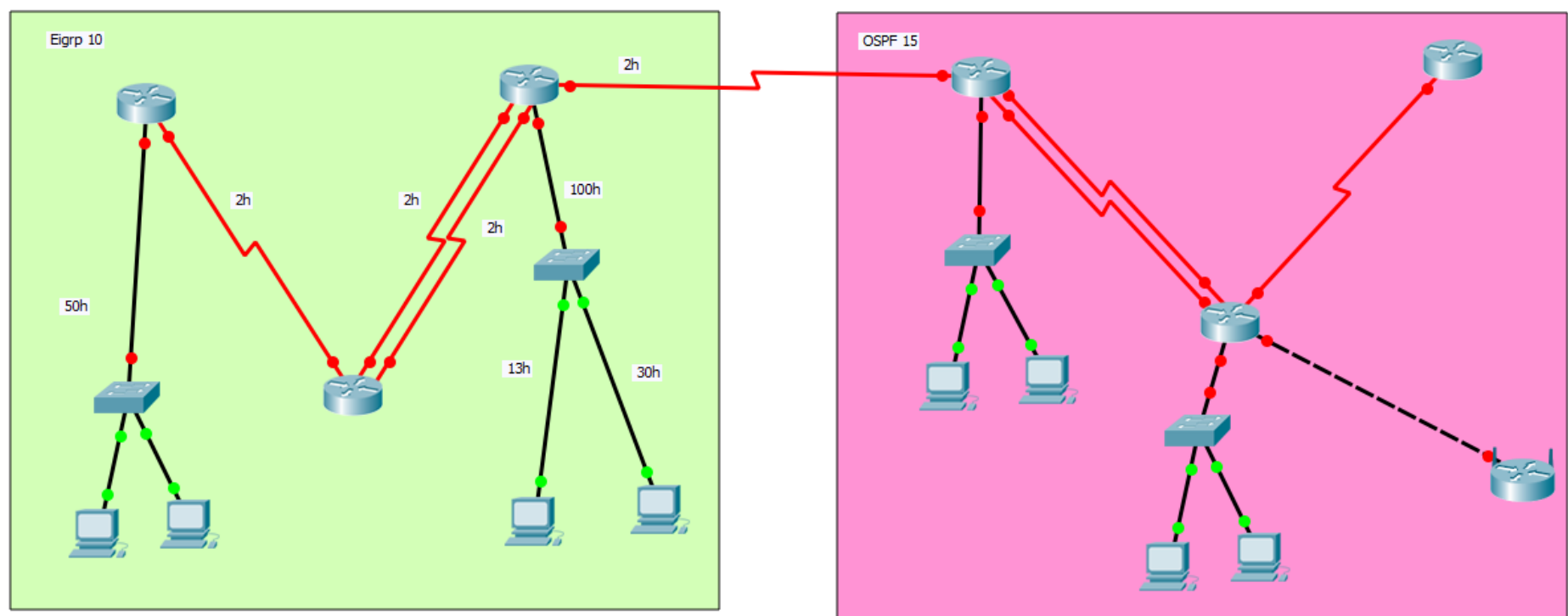
NAME: Syed Muzzamil Waseem

SID: 11067

CID: 109138

Instructions (READ AND FOLLOW INSTRUCTIONS CAREFULLY):

- In case of **CHEATING, COPIED material or any unfair means would result in ZERO marks.**
- Mention your name and ID above and write solution in this file and then submit in word or PDF format.
- Late submission will result in mark deduction



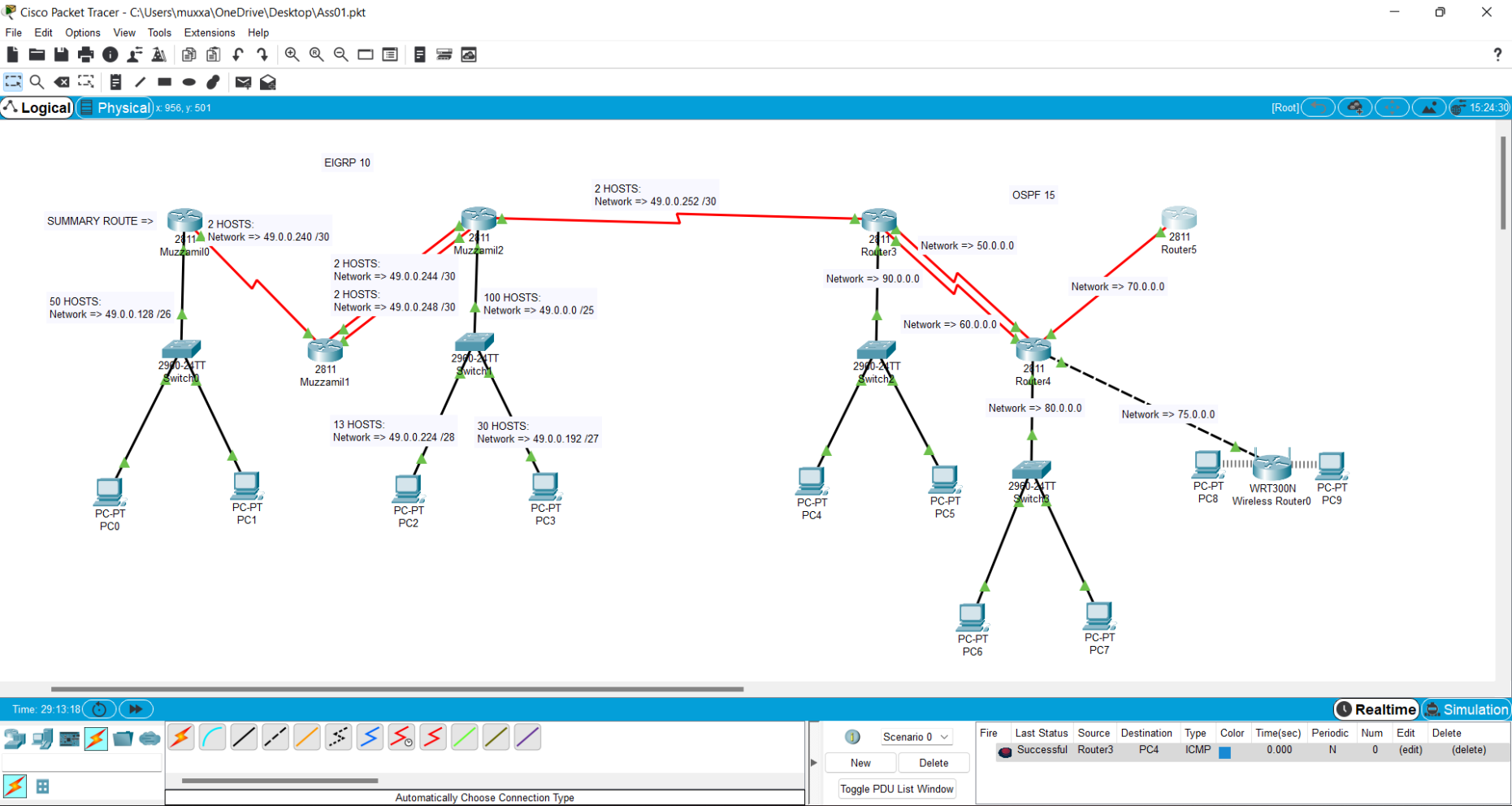
Instructions (for Topology Configuration)

- Change all router hostname with your name
- Use major network which is assigned to you only
- Configure Eigrp on left side.
- Configure the Eigrp part using VLSM.
- Configure DHCP on Wireless Router
- While configuring Eigrp configure summarize route.
- Configure floating routes where necessary.
- All routers should communicate with each other.
- All end devices should communicate within their respective areas
- Submit screenshot of topology with network labels
- Submit screenshots of routing table of all routers
- Submit screenshot of DHCP

If anyone failed to follow any instruction I will deduct 1 marks for each instruction.

[Solution]

TOPOLOGY WITH NETWORK LABELS:



EIGRP CONFIGURATION:

Muzzamil0

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname Muzzamil_11067
Muzzamil_11067(config)#
Muzzamil_11067(config)#end
Muzzamil_11067#copy running-config startup-config
Destination filename [startup-config]?
Building configuration...
[OK]
Muzzamil_11067#
%SYS-5-CONFIG_I: Configured from console by console

Muzzamil_11067#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Muzzamil_11067(config)#interface Serial0/3/0
Muzzamil_11067(config-if)#exit
Muzzamil_11067(config)#router eigrp 10
Muzzamil_11067(config-router)#net 49.0.0.128 255.255.255.192
Muzzamil_11067(config-router)#net 49.0.0.240 255.255.255.252
Muzzamil_11067(config-router)#
```

Muzzamil1

```
is up: new adjacency

Muzzamil_11067>en
Muzzamil_11067#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Muzzamil_11067(config)#router eigrp 10
Muzzamil_11067(config-router)#no net 49.0.0.252 255.255.255.252
Muzzamil_11067(config-router)#net 49.0.0.240 255.255.255.252
Muzzamil_11067(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 10: Neighbor 49.0.0.250 (Serial0/2/0)
is up: new adjacency

Muzzamil_11067(config-router)#net 49.0.0.244 255.255.255.252
Muzzamil_11067(config-router)#net 49.0.0.248 255.255.255.252
Muzzamil_11067(config-router)#net 49.0.0.240 255.255.255.252
Muzzamil_11067(config-router)#exit
Muzzamil_11067(config)#
```

Muzzamil2

```
Muzzamil_11067>enable
Muzzamil_11067#
Muzzamil_11067#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Muzzamil_11067(config)#interface Serial0/3/0
Muzzamil_11067(config-if)#
Muzzamil_11067(config-if)#exit
Muzzamil_11067(config)#interface Serial0/3/0
Muzzamil_11067(config-if)#exit
Muzzamil_11067(config)#router eigrp 10
Muzzamil_11067(config-router)#49.0.0.252 255.255.255.252
Muzzamil_11067(config-router)#
% Invalid input detected at '^' marker.

Muzzamil_11067(config-router)#net 49.0.0.252 255.255.255.252
Muzzamil_11067(config-router)#net 49.0.0.248 255.255.255.252
Muzzamil_11067(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 10: Neighbor 49.0.0.245 (Serial0/3/0)
is up: new adjacency

Muzzamil_11067(config-router)#net 49.0.0.0 255.255.255.128
Muzzamil_11067(config-router)#net 49.0.0.248 255.255.255.252
Muzzamil_11067(config-router)#
%DUAL-5-NBRCHANGE: IP-EIGRP 10: Neighbor 49.0.0.249 (Serial0/3/1)
is up: new adjacency
```

SUMMARY ROUTE:

Muzzamil0

```
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/3/0,
changed state to up

%DUAL-5-NBRCHANGE: IP-EIGRP 10: Neighbor 49.0.0.242 (Serial0/3/0)
is up: new adjacency

Muzzamil_11067>en
Muzzamil_11067#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Muzzamil_11067(config)#ip route 49.0.0.0 255.255.255.0 49.0.0.242
Muzzamil_11067(config)#ip route 49.0.0.0 255.255.255.0 49.0.0.128
Muzzamil_11067(config)#exit
Muzzamil_11067#
%SYS-5-CONFIG_I: Configured from console by console
```

FLOATING ROUTES:

Muzzamil1

PhysicalConfigCLIAttributes

IOS Command Line Interface

Press RETURN to get started.

Muzzamil_11067>en
Muzzamil_11067#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Muzzamil_11067(config)#ip route 49.0.0.0 255.255.255.128 49.0.0.246 15
Muzzamil_11067(config)#ip route 49.0.0.252 255.255.255.252 49.0.0.246 15
Muzzamil_11067(config)#exit
Muzzamil_11067#
%SYS-5-CONFIG_I: Configured from console by console

Ctrl+F6 to exit CLI focus

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☐ Top

Muzzamil2

PhysicalConfigCLIAttributes

IOS Command Line Interface

Muzzamil_11067>en
Muzzamil_11067#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Muzzamil_11067(config)#ip route 49.0.0.240 255.255.255.252 79.0.0.245
Muzzamil_11067(config)#no ip route 49.0.0.240 255.255.255.252 79.0.0.245
Muzzamil_11067(config)#ip route 49.0.0.240 255.255.255.252 79.0.0.245 15
Muzzamil_11067(config)#ip route 49.0.0.128 255.255.255.252 79.0.0.245 15
Muzzamil_11067(config)#no ip route 49.0.0.128 255.255.255.252 79.0.0.245 15
Muzzamil_11067(config)#no ip route 49.0.0.128 255.255.255.192 79.0.0.245 15
%No matching route to delete
Muzzamil_11067(config)#ip route 49.0.0.128 255.255.255.192 79.0.0.245 15
Muzzamil_11067(config)#exit
Muzzamil_11067#
%SYS-5-CONFIG_I: Configured from console by console

Ctrl+F6 to exit CLI focus

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☐ Top

TESTING COMMUNICATION WITH ROUTERS AND END DEVICES:

Cisco Packet Tracer - C:\Users\muxxa\OneDrive\Desktop\Ass01.pkt

File Edit Options View Tools Extensions Help

LogicalPhysical

x 1343, y 105

[Root]

01:03:30

EIGRP 10

OSPF 15

2111 Muzzamil0

2111 Muzzamil2

2111 Router3

2811 Router5

2900-24TT Switch1

2900-24TT Switch2

2900-24TT Switch3

2900-24TT Switch4

PC-PT

PC-PT

PC-PT

PC-PT

PC-PT

PC-PT

PC-PT

WRT300N Wireless Router0

PC8

PC9

SUMMARY ROUTE =>

2 HOSTS: Network => 49.0.0.240 /30

50 HOSTS: Network => 49.0.0.128 /26

2 HOSTS: Network => 49.0.0.244 /30

2 HOSTS: Network => 49.0.0.248 /30

100 HOSTS: Network => 49.0.0.0 /25

13 HOSTS: Network => 49.0.0.224 /28

30 HOSTS: Network => 49.0.0.192 /27

2 HOSTS: Network => 49.0.0.252 /30

Network => 50.0.0.0

Network => 90.0.0.0

Network => 60.0.0.0

Network => 70.0.0.0

Network => 80.0.0.0

Network => 75.0.0.0

PDU List Window

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	Muza...	Muzzamil2	ICMP		0.000	N	0	(edit)	(delete)
	Successful	Muza...	PC1	ICMP		0.000	N	1	(edit)	(delete)
	Successful	Muza...	PC3	ICMP		0.000	N	2	(edit)	(delete)
	Successful	Router3	Router5	ICMP		0.000	N	3	(edit)	(delete)
	Successful	Router5	PC5	ICMP		0.000	N	4	(edit)	(delete)
	Successful	PC4	PC7	ICMP		0.000	N	5	(edit)	(delete)
	Successful	Wirele...	PC8	ICMP		0.000	N	6	(edit)	(delete)

Time: 00:02:04

4331 4321 1941 2901 2911 81910X 81910X 829 1240 P5Router P5Empty 1841 26200M 26210M 2811

(Select a Device to Drag and Drop to the Workspace)

Scenario 0

New Delete

Toggle PDU List Window

ROUTING TABLES:

Muzzamil1

Physical Config CLI Attributes

IOS Command Line Interface

```
49.0.0.246 is
Muzzamil_11067(config)#exit
Muzzamil_11067#
%SYS-5-CONFIG_I: Configured from console by console

Muzzamil_11067#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

      49.0.0.0/8 is variably subnetted, 6 subnets, 3 masks
S       49.0.0.0/25 [15/0] via 49.0.0.246
D       49.0.0.128/26 [90/2172416] via 49.0.0.241, 02:51:52,
Serial0/3/0
C       49.0.0.240/30 is directly connected, Serial0/3/0
C       49.0.0.244/30 is directly connected, Serial0/3/1
C       49.0.0.248/30 is directly connected, Serial0/2/0
S       49.0.0.252/30 [15/0] via 49.0.0.246

Muzzamil_11067#
```

Ctrl+F6 to exit CLI focus

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☐ Top

Muzzamil2

Physical Config CLI Attributes

IOS Command Line Interface

```
Muzzamil_11067#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

      49.0.0.0/8 is variably subnetted, 6 subnets, 3 masks
C       49.0.0.0/25 is directly connected, FastEthernet0/0
D       49.0.0.128/26 [90/2684416] via 49.0.0.249, 02:52:21,
Serial0/3/1
          [90/2684416] via 49.0.0.245, 02:52:21,
Serial0/3/0
D       49.0.0.240/30 [90/2681856] via 49.0.0.245, 02:52:21,
Serial0/3/0
          [90/2681856] via 49.0.0.249, 02:52:21,
Serial0/3/1
C       49.0.0.244/30 is directly connected, Serial0/3/0
C       49.0.0.248/30 is directly connected, Serial0/3/1
C       49.0.0.252/30 is directly connected, Serial0/2/0

Muzzamil_11067#
```

Ctrl+F6 to exit CLI focus

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☐ Top

Muzzamil0

Physical Config CLI Attributes

IOS Command Line Interface

```
Muzzamil_11067#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

      49.0.0.0/8 is variably subnetted, 7 subnets, 4 masks
S       49.0.0.0/24 [1/0] via 49.0.0.242
          [1/0] via 49.0.0.128
D       49.0.0.0/25 [90/2684416] via 49.0.0.242, 02:51:24,
Serial0/3/0
C       49.0.0.128/26 is directly connected, FastEthernet0/0
C       49.0.0.240/30 is directly connected, Serial0/3/0
D       49.0.0.244/30 [90/2681856] via 49.0.0.242, 02:51:24,
Serial0/3/0
D       49.0.0.248/30 [90/2681856] via 49.0.0.242, 02:51:24,
Serial0/3/0
D       49.0.0.252/30 [90/3193856] via 49.0.0.242, 02:51:24,
Serial0/3/0

Muzzamil_11067#
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

Router3

Physical Config CLI Attributes

IOS Command Line Interface

```
Muzzamil_11067#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

      49.0.0.0/30 is subnetted, 1 subnets
C       49.0.0.252 is directly connected, Serial0/3/0
C       50.0.0.0/8 is directly connected, Serial0/3/1
C       60.0.0.0/8 is directly connected, Serial0/2/0
O       70.0.0.0/8 [110/128] via 50.0.0.2, 01:25:52, Serial0/3/1
O       80.0.0.0/8 [110/65] via 50.0.0.2, 01:25:41, Serial0/3/1
C       90.0.0.0/8 is directly connected, FastEthernet0/0

Muzzamil_11067#
```

Ctrl+F6 to exit CLI focus

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☐ Top

Router5

Physical Config CLI Attributes

IOS Command Line Interface

```
Muzzamil_11067#en
Muzzamil_11067#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

O       50.0.0.0/8 [110/128] via 70.0.0.1, 01:23:51, Serial0/3/0
O       60.0.0.0/8 [110/128] via 70.0.0.1, 01:23:51, Serial0/3/0
C       70.0.0.0/8 is directly connected, Serial0/3/0
O       80.0.0.0/8 [110/65] via 70.0.0.1, 01:23:51, Serial0/3/0
O       90.0.0.0/8 [110/129] via 70.0.0.1, 01:23:51, Serial0/3/0

Muzzamil_11067#
```

Ctrl+F6 to exit CLI focus

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☐ Top

Router4

Physical Config CLI Attributes

IOS Command Line Interface

```
Muzzamil_11067#en
Muzzamil_11067#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

C       50.0.0.0/8 is directly connected, Serial0/3/0
C       60.0.0.0/8 is directly connected, Serial0/3/1
C       70.0.0.0/8 is directly connected, Serial0/2/0
C       75.0.0.0/8 is directly connected, FastEthernet0/1
C       80.0.0.0/8 is directly connected, FastEthernet0/0
O       90.0.0.0/8 [110/65] via 50.0.0.1, 01:26:06, Serial0/3/0

Muzzamil_11067#
```

Ctrl+F6 to exit CLI focus

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☐ Top

OSPF CONFIGURATION:

Router3

Physical Config CLI Attributes

IOS Command Line Interface

```
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname Muzzamil_11067
Muzzamil_11067(config)#router ospf 15
Muzzamil_11067(config-router)#net 50.0.0.0 255.0.0.0 area 0
Muzzamil_11067(config-router)#net 60.0.0.0 255.0.0.0 area 0
Muzzamil_11067(config-router)#net 90.0.0.0 255.0.0.0 area 0
Muzzamil_11067(config-router)#exit
Muzzamil_11067(config)#
03:43:10: %OSPF-5-ADJCHG: Process 15, Nbr 80.0.0.1 on Serial0/3/1
from LOADING to FULL, Loading Done

03:43:19: %OSPF-5-ADJCHG: Process 15, Nbr 80.0.0.1 on Serial0/2/0
from LOADING to FULL, Loading Done

Muzzamil_11067(config)#exit
Muzzamil_11067#
%SYS-5-CONFIG_I: Configured from console by console

Muzzamil_11067#
```

Ctrl+F6 to exit CLI focus

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☐ Top

Router4

Physical Config CLI Attributes

IOS Command Line Interface

```
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname Muzzamil_11067
Muzzamil_11067(config)#
Muzzamil_11067(config)#router ospf 15
Muzzamil_11067(config-router)#net 50.0.0.0 255.0.0.0 area 0
Muzzamil_11067(config-router)#net 60.0.0.0 255.0.0.0 area 0
Muzzamil_11067(config-router)#
03:43:10: %OSPF-5-ADJCHG: Process 15, Nbr 90.0.0.1 on Serial0/3/0
from LOADING to FULL, Loading Done

03:43:19: %OSPF-5-ADJCHG: Process 15, Nbr 90.0.0.1 on Serial0/3/1
from LOADING to FULL, Loading Done

Muzzamil_11067(config-router)#net 70.0.0.0 255.0.0.0 area 0
Muzzamil_11067(config-router)#net 80.0.0.0 255.0.0.0 area 0
Muzzamil_11067(config-router)#exit
Muzzamil_11067(config)#
03:45:51: %OSPF-5-ADJCHG: Process 15, Nbr 70.0.0.2 on Serial0/2/0
from LOADING to FULL, Loading Done

Muzzamil_11067(config)#exit
Muzzamil_11067#
%SYS-5-CONFIG_I: Configured from console by console

Muzzamil_11067#
```

Ctrl+F6 to exit CLI focus

Copy Paste

☐ Top

Router5

Physical Config CLI Attributes

IOS Command Line Interface

```
Router>
Router>enable
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#hostname Muzzamil_11067
Muzzamil_11067(config)#
Muzzamil_11067(config)#router ospf 15
Muzzamil_11067(config-router)#net 70.0.0.0 255.0.0.0
% Incomplete command.
Muzzamil_11067(config-router)#net 70.0.0.0 255.0.0.0 area 0
Muzzamil_11067(config-router)#ex
03:45:51: %OSPF-5-ADJCHG: Process 15, Nbr 80.0.0.1 on Serial0/3/0
from LOADING to FULL, Loading Done

Muzzamil_11067(config)#exit
Muzzamil_11067#
%SYS-5-CONFIG_I: Configured from console by console

Muzzamil_11067#
```

Ctrl+F6 to exit CLI focus

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☐ Top

DHCP CONFIGURATION AND CHECK ITS CONNECTIVITY WITH END DEVICES:

Router4
Physical
Config
CLI
Attributes

IOS Command Line Interface

```

Muzzamil_11067(config)#ip dhcp pool Muzzamil
Muzzamil_11067(dhcp-config)#network 75.0.0.0 255.0.0.0
Muzzamil_11067(dhcp-config)#%DHCPD-4-PING_CONFLICT: DHCP address conflict: server pinged 75.0.0.1.
Muzzamil_11067(dhcp-config)#network 75.0.0.0 255.0.0.0
Muzzamil_11067(dhcp-config)#default-router 75.0.0.1
Muzzamil_11067(dhcp-config)#exit
Muzzamil_11067(config)#exit
Muzzamil_11067#
%SYS-5-CONFIG_I: Configured from console by console

```

Wireless Router0
Physical
Config
GUI
Attributes

GLOBAL
Settings
Algorithm Settings
INTERFACE
Internet
LAN
Wireless

Internet Settings
IP Configuration
☒ DHCP
☐ Static
☐ PPPoE
UserName
Password
IP Address
75.0.0.2
Subnet Mask
255.0.0.0
Default Gateway
75.0.0.1

PC8
Physical
Config
Desktop
Programming
Attributes

IP Configuration

Interface Wireless0

IP Configuration

☒ DHCP
☐ Static
DHCP request successful.

IP Address
76.0.0.101
Subnet Mask
255.0.0.0
Default Gateway
76.0.0.1
DNS Server
0.0.0.0

IPv6 Configuration

☒ DHCP
☐ Auto Config
☐ Static
DHCPv6 request failed.

IPv6 Address
Link Local Address
FE80::2D0:BAFF:FE05:8C32
IPv6 Gateway
IPv6 DNS Server

PC9
Physical
Config
Desktop
Programming
Attributes

IP Configuration

Interface Wireless0

IP Configuration

☒ DHCP
☐ Static
DHCP request successful.

IP Address
76.0.0.102
Subnet Mask
255.0.0.0
Default Gateway
76.0.0.1
DNS Server
0.0.0.0

IPv6 Configuration

☒ DHCP
☐ Auto Config
☐ Static
DHCPv6 request failed.

IPv6 Address
Link Local Address
FE80::2D0:FFFF:FE05:D974
IPv6 Gateway
IPv6 DNS Server