

## CS 4471 LAB ASSIGNMENT 9

OSPF (Open Shortest Path First) (version 1.0)

GROUP-3

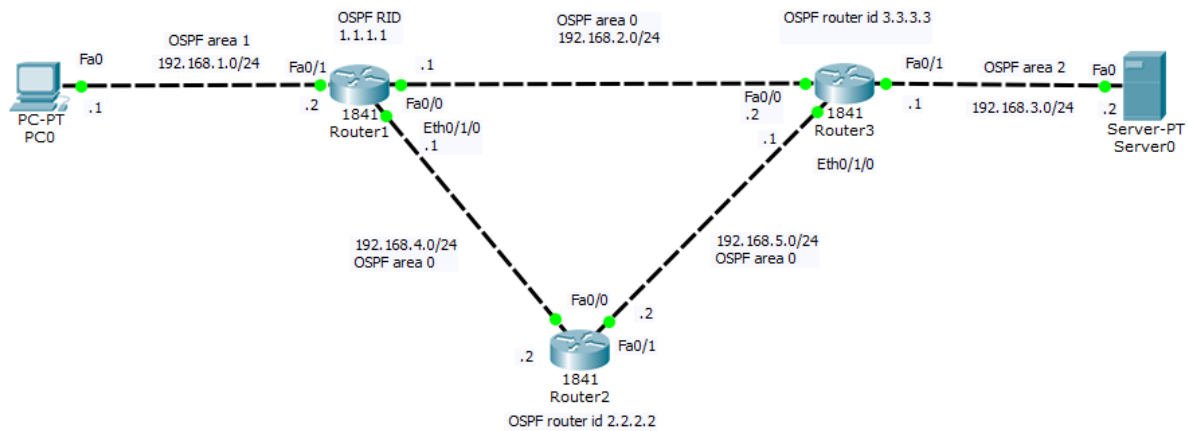
SHAH DAMIN

PATEL PARTH

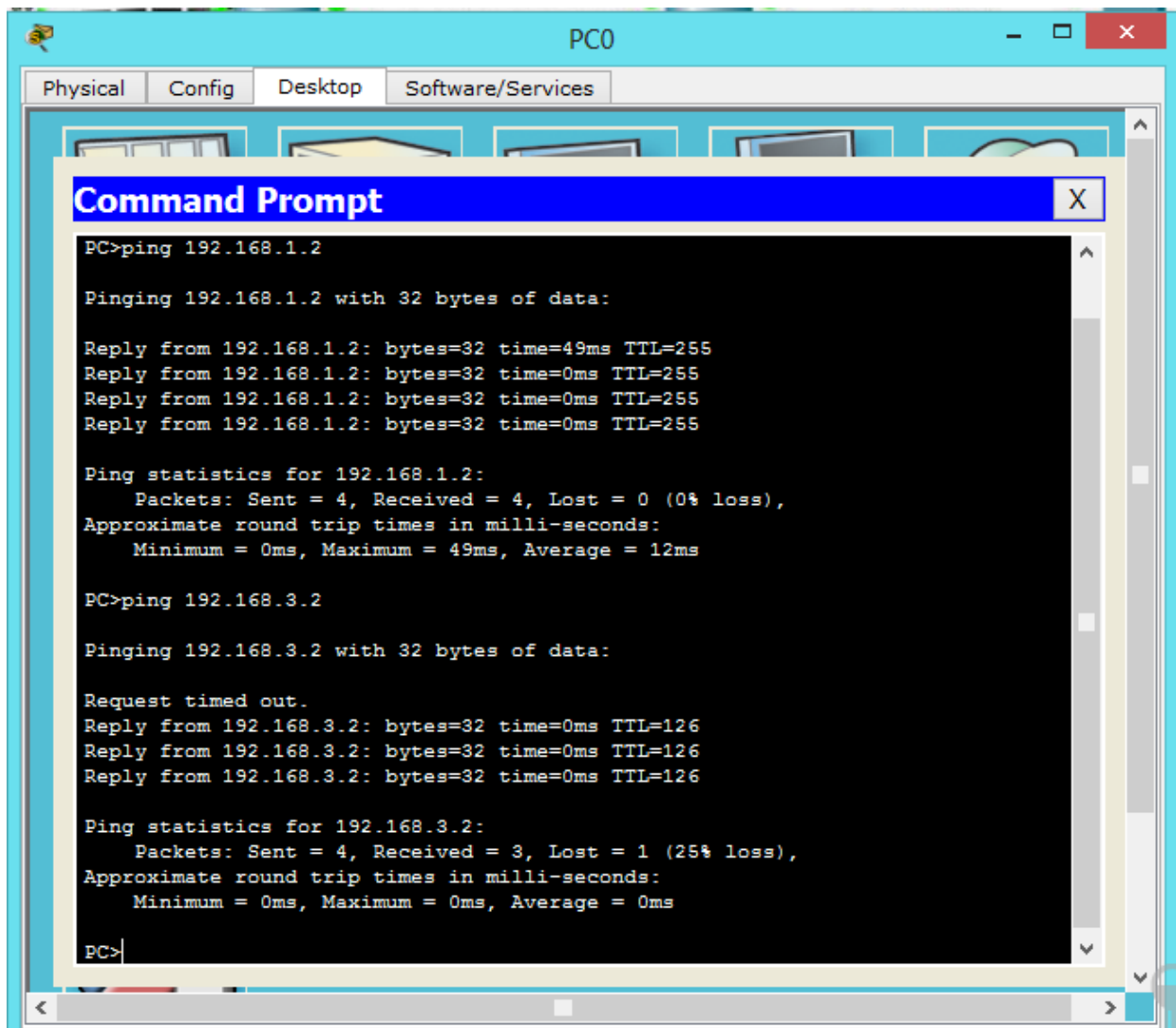
PATEL YASH

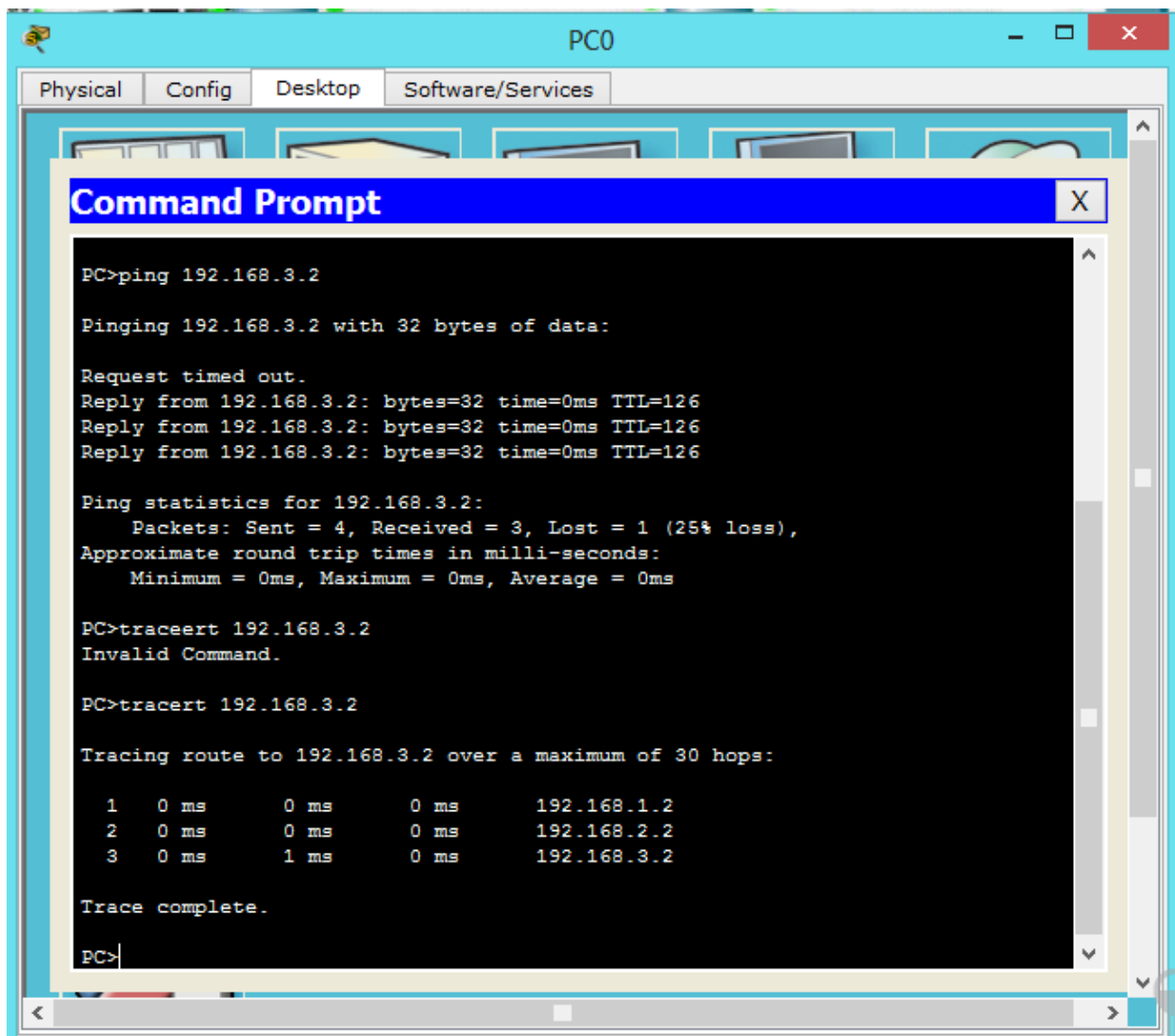
PATEL ANUJ

Use Cisco Packet Tracer program to create the network shown below containing 3 interconnected Cisco 1841 routers, one computer, and one server.



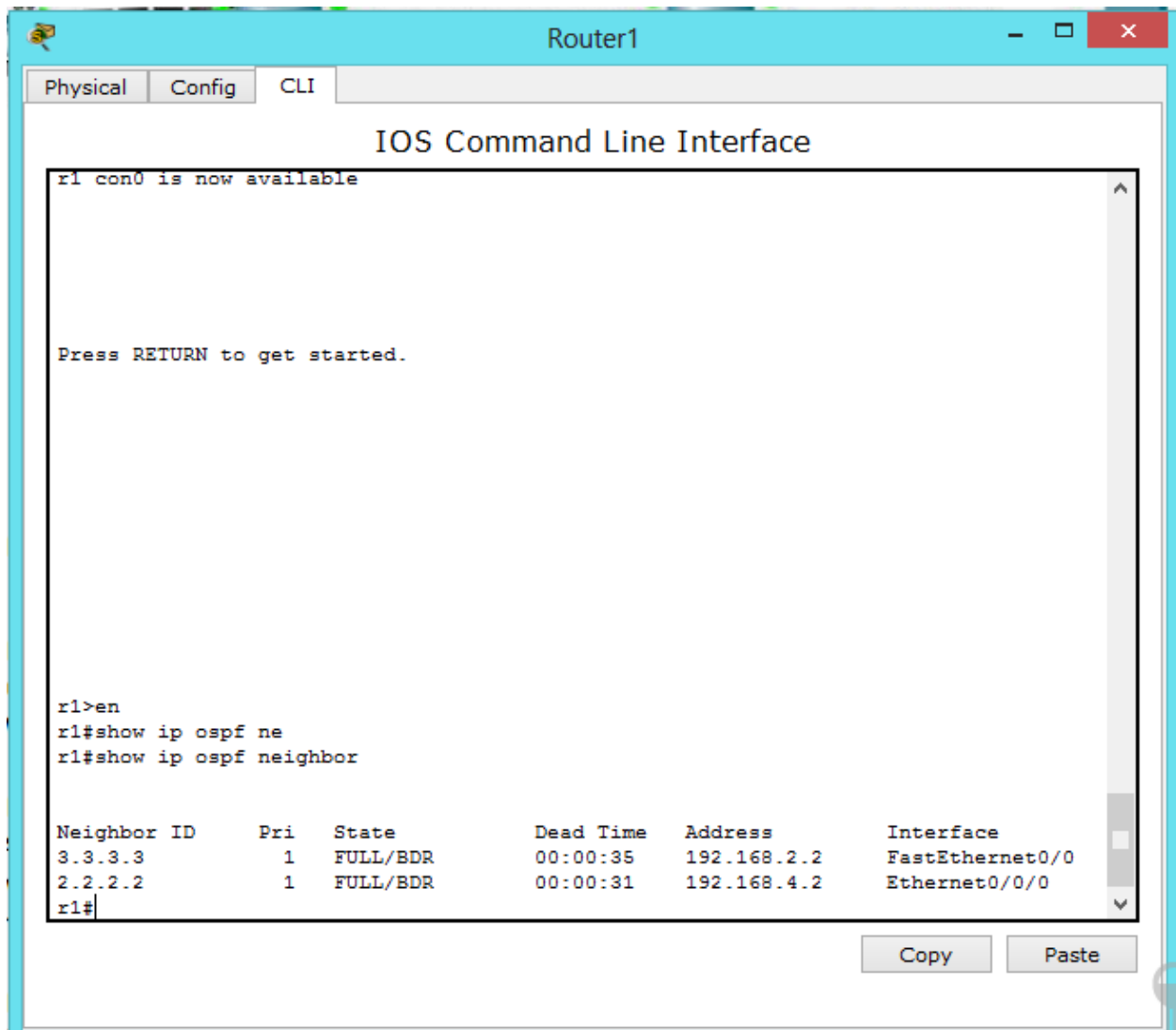
1. (20 pts) Verify that from PC0 you can ping the IP address of the other devices. Submit screenshot of output of command "tracert 192.168.3.2".





Q 2) On Router1, verify that OSPF adjacency has been established with the other two routers.

a) . Submit output of IOS command "show ip ospf neighbor" executed on Router1.



b. What OSPF state should the routers be in when everything is working correctly?

```
Neighbor ID Pri State Dead Time Address Interface
3.3.3.3 1 FULL/BDR 00:00:35 192.168.2.2 FastEthernet0/0
2.2.2.2 1 FULL/BDR 00:00:31 192.168.4.2 Ethernet0/0/0
```

Q3) on Router3,

a. submit the output of "show ip ospf interface".

```
r3#show ip ospf interface
```

```
FastEthernet0/0 is up, line protocol is up
Internet address is 192.168.2.2/24, Area 0
Process ID 1, Router ID 3.3.3.3, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 1.1.1.1, Interface address 192.168.2.1
Backup Designated Router (ID) 3.3.3.3, Interface address
192.168.2.2
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:08
Index 1/1, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 1.1.1.1 (Designated Router)
Suppress hello for 0 neighbor(s)
Ethernet0/0/0 is up, line protocol is up
Internet address is 192.168.5.1/24, Area 0
Process ID 1, Router ID 3.3.3.3, Network Type BROADCAST, Cost:
10
Transmit Delay is 1 sec, State BDR, Priority 1
Designated Router (ID) 2.2.2.2, Interface address 192.168.5.2
Backup Designated Router (ID) 3.3.3.3, Interface address
192.168.5.1
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:07
Index 2/2, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 1, Adjacent neighbor count is 1
Adjacent with neighbor 2.2.2.2 (Designated Router)
Suppress hello for 0 neighbor(s)
FastEthernet0/1 is up, line protocol is up
Internet address is 192.168.3.1/24, Area 2
Process ID 1, Router ID 3.3.3.3, Network Type BROADCAST, Cost: 1
Transmit Delay is 1 sec, State DR, Priority 1
Designated Router (ID) 3.3.3.3, Interface address 192.168.3.1
No backup designated router on this network
```

```
Timer intervals configured, Hello 10, Dead 40, Wait 40,
Retransmit 5
Hello due in 00:00:08
Index 3/3, flood queue length 0
Next 0x0(0)/0x0(0)
Last flood scan length is 1, maximum is 1
Last flood scan time is 0 msec, maximum is 0 msec
Neighbor Count is 0, Adjacent neighbor count is 0
Suppress hello for 0 neighbor(s)
```

b. What is the significance of the values of the OSPF Hello time, Dead time, Wait Time, and Retransmit time shown in the output?

```
Timer intervals configured,
Dead 40,
Wait 40,
Retransmit 5
Hello due in 00:00:08
```

Q 4) On Router2, execute command "traceroute 192.168.2.1" a few times.

a. How should Router2 route traffic destined to network 192.168.2.0/24 ?

```
r2#traceroute 192.168.2.1
Type escape sequence to abort.
Tracing the route to 192.168.2.1

 0 192.168.4.1 2 msec 0 msec 0 msec
Traffic destined to the network in 2 msec
```

b. Submit output of command "show ip route" from Router2.

```
r2# 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

```
2.0.0.0/32 is subnetted, 1 subnets
C 2.2.2.2 is directly connected, Loopback0
O IA 192.168.1.0/24 [110/2] via 192.168.4.1, 00:24:06,
FastEthernet0/0
O 192.168.2.0/24 [110/2] via 192.168.4.1, 00:23:05,
FastEthernet0/0
[110/2] via 192.168.5.1, 00:23:05, FastEthernet0/1
O IA 192.168.3.0/24 [110/2] via 192.168.5.1, 00:22:15,
FastEthernet0/1
C 192.168.4.0/24 is directly connected, FastEthernet0/0
C 192.168.5.0/24 is directly connected, FastEthernet0/1
```

Q5) submit printout of output of “show running-config” of each router

#### **Router 1**

```
r1#show running-config
Building configuration...
```

```
Current configuration : 876 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname r1
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
```



```
!  
!  
!  
!  
!  
!  
spanning-tree mode pvst  
!  
!  
!  
!  
!  
!  
interface Loopback0  
ip address 1.1.1.1 255.255.255.255  
!  
interface FastEthernet0/0  
ip address 192.168.2.1 255.255.255.0  
duplex auto  
speed auto  
!  
interface FastEthernet0/1  
ip address 192.168.1.2 255.255.255.0  
duplex auto  
speed auto  
!  
interface Ethernet0/0/0  
ip address 192.168.4.1 255.255.255.0  
duplex auto  
speed auto  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router ospf 1  
log-adjacency-changes  
network 192.168.1.0 0.0.0.255 area 1  
network 192.168.4.0 0.0.0.255 area 0  
network 192.168.2.0 0.0.0.255 area 0  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
!
```

```
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!  
line vty 0 4  
login  
!  
!  
!  
End
```

## **Router 2**

```
r2#show running-config  
Building configuration...  
  
Current configuration : 825 bytes  
!  
version 12.4  
no service timestamps log datetime msec  
no service timestamps debug datetime msec  
no service password-encryption  
!  
hostname r2  
!  
!  
!  
!  
!  
!  
!  
!  
no ip cef  
no ipv6 cef  
!  
!  
!  
!  
!  
!  
!  
!  
!  
!
```

```
!  
!  
spanning-tree mode pvst  
!  
!  
!  
!  
!  
!  
interface Loopback0  
ip address 2.2.2.2 255.255.255.255  
!  
interface FastEthernet0/0  
ip address 192.168.4.2 255.255.255.0  
duplex auto  
speed auto  
!  
interface FastEthernet0/1  
ip address 192.168.5.2 255.255.255.0  
duplex auto  
speed auto  
!  
interface Ethernet0/0/0  
no ip address  
duplex auto  
speed auto  
shutdown  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router ospf 1  
log-adjacency-changes  
network 192.168.4.0 0.0.0.255 area 0  
network 192.168.5.0 0.0.0.255 area 0  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
!  
!  
!  
!  
!
```



```
!
!  
!  
!  
!  
interface Loopback0  
ip address 3.3.3.3 255.255.255.255  
!  
interface FastEthernet0/0  
ip address 192.168.2.2 255.255.255.0  
duplex auto  
speed auto  
!  
interface FastEthernet0/1  
ip address 192.168.3.1 255.255.255.0  
duplex auto  
speed auto  
!  
interface Ethernet0/0/0  
ip address 192.168.5.1 255.255.255.0  
duplex auto  
speed auto  
!  
interface Vlan1  
no ip address  
shutdown  
!  
router ospf 1  
log-adjacency-changes  
network 192.168.2.0 0.0.0.255 area 0  
network 192.168.5.0 0.0.0.255 area 0  
network 192.168.3.0 0.0.0.255 area 2  
!  
ip classless  
!  
ip flow-export version 9  
!  
!  
!  
!  
!  
!  
line con 0  
!  
line aux 0  
!
```

```
line vty 0 4
login
!
!
!
end
```