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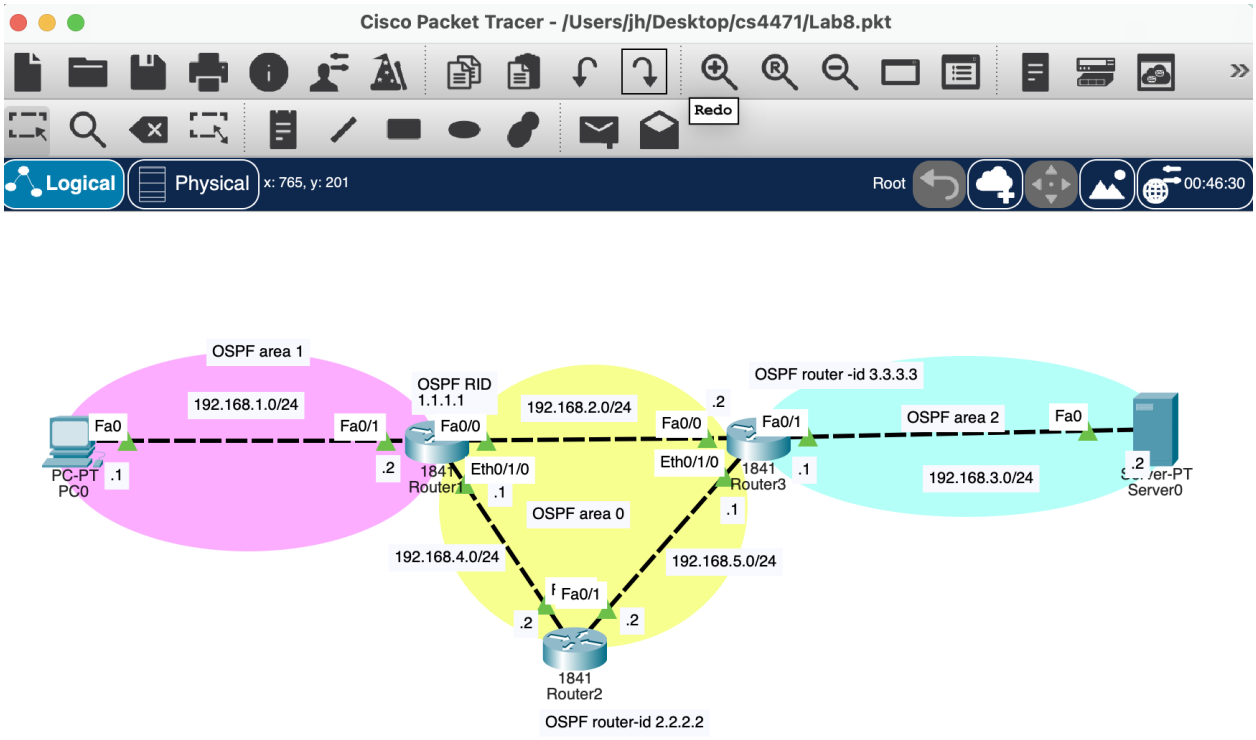
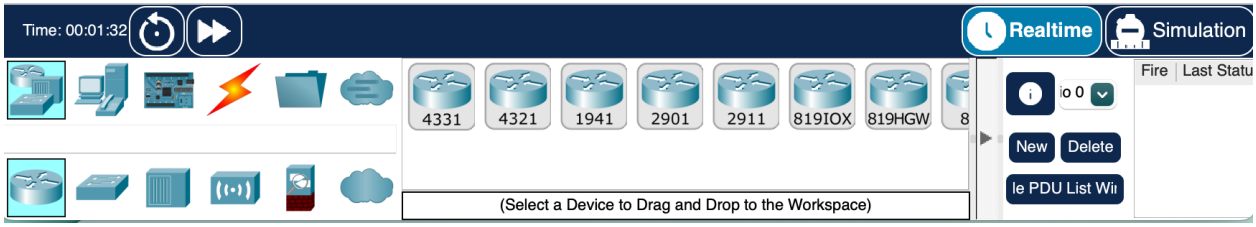
Lab 8 - OSPF

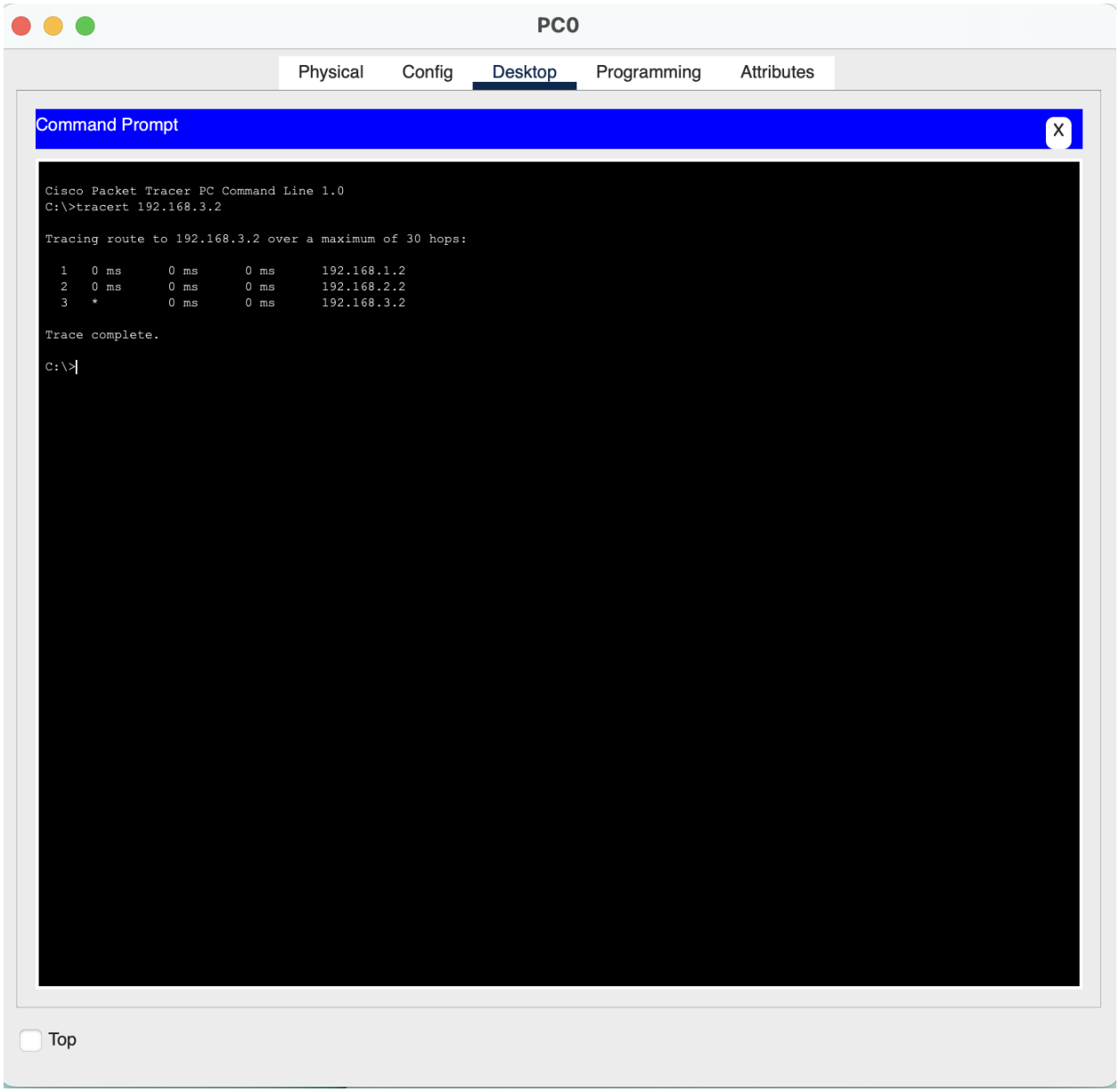
1. (2 pts) Verify that from PC0 you can ping the IP address of the other devices.

a. Submit screenshot of the network drawn in Cisco Packet Tracer.



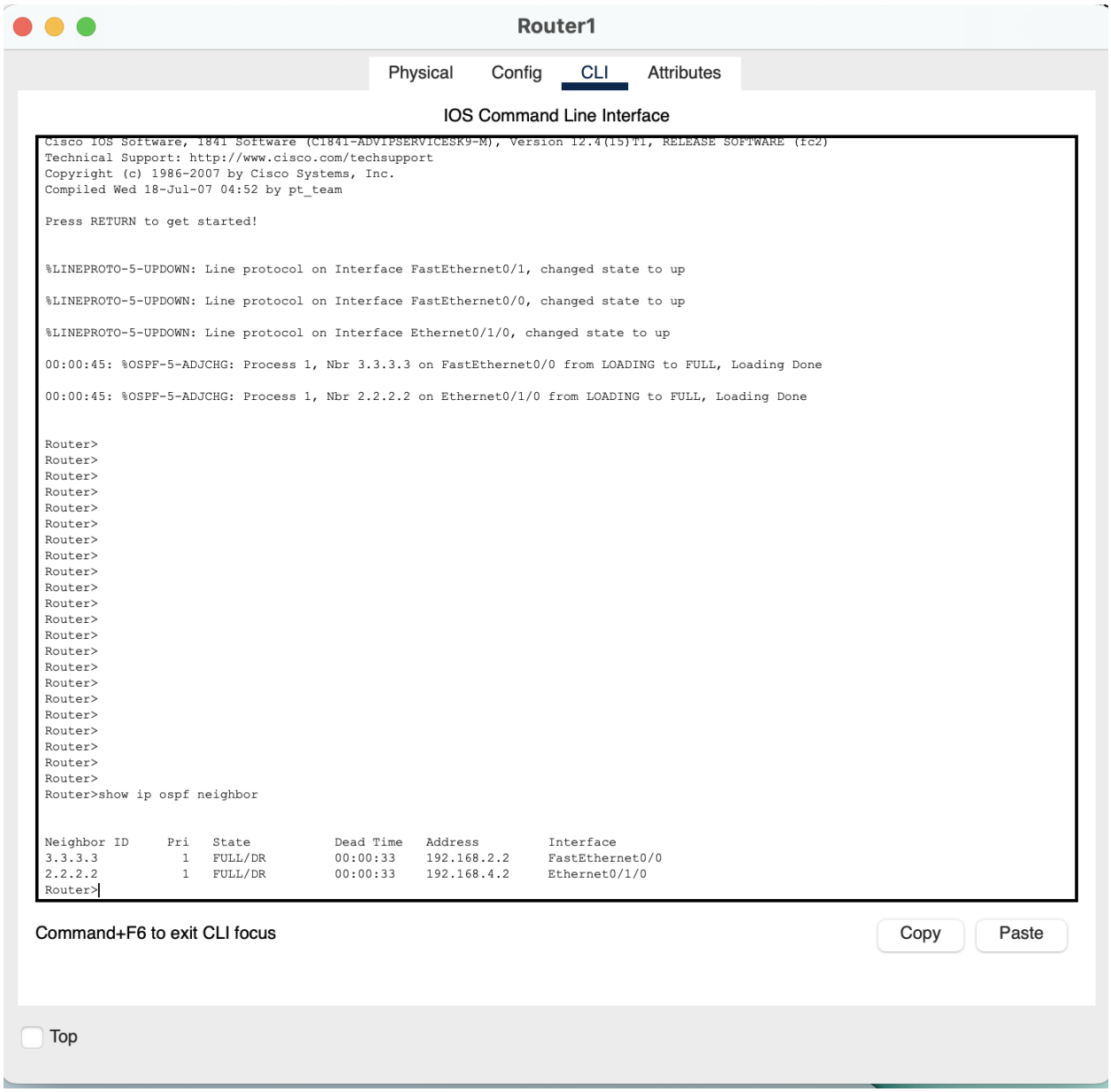


b. Submit screenshot of output of command "tracert 192.168.3.2".



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

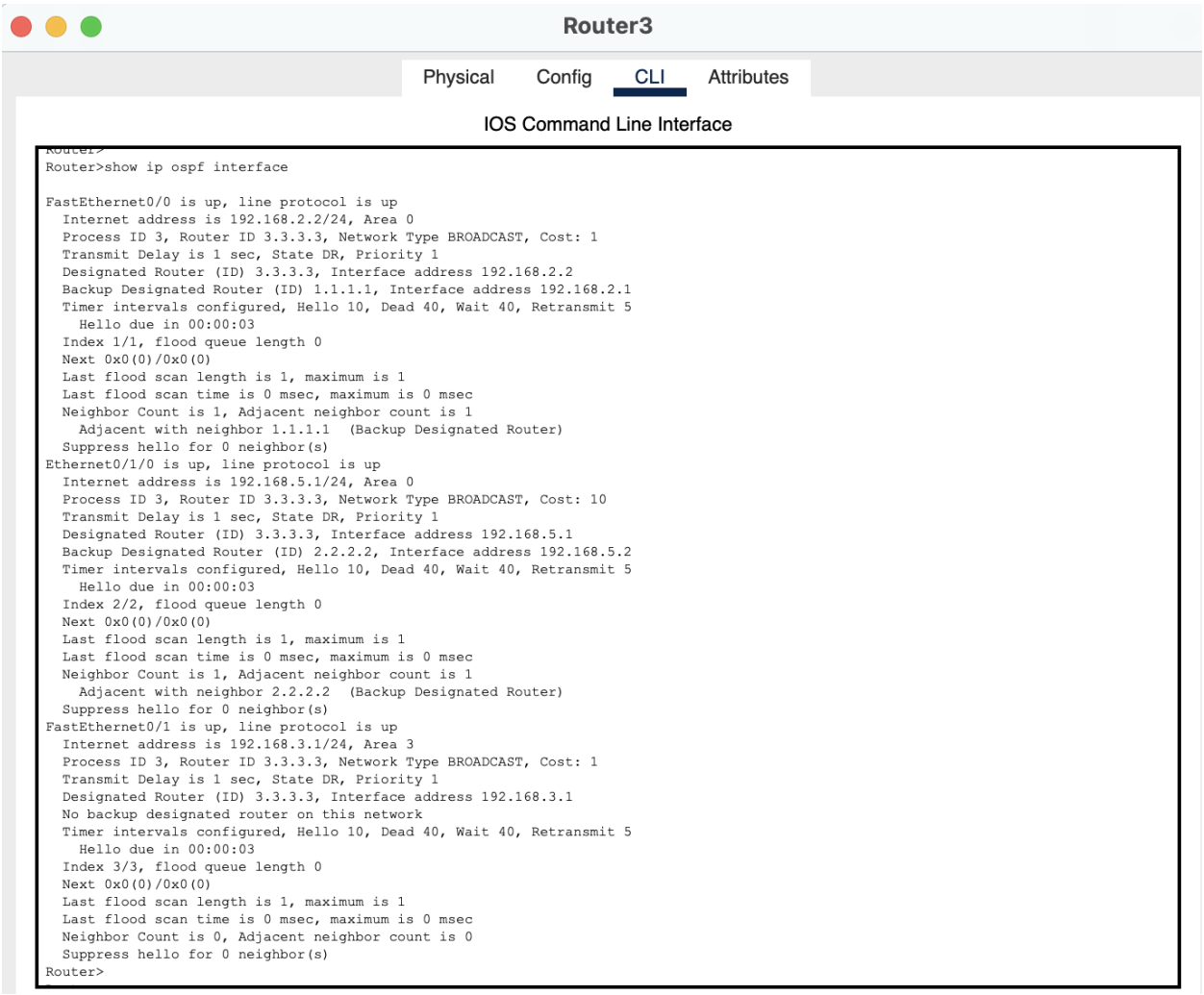
a. Submit output of IOS command "show ip ospf neighbor" executed on Router1.



b. What are 7 possible states that OSPF can be in?
The seven possible states that OSPF can be is down, attempt/init, two ways, exstart, exchange, loading, and full.

c. What OSPF state should the router2 be in with each OSPF neighbor when everything is working correctly?
Router2 OSPF states should be in Full states when everything is working fine

3. (1.5 pts) on Router3,
a. submit the output of "show ip ospf interface".



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

Hello - is how long we should wait for a hello packet

Dead - is how long to wait until it assumes its neighbor is dead

Wait - keeps the routers in a waiting state and once the wait timer expires the router interface comes out of the waiting state an start DR and BDR election process. The router waits and monitors the hello message to see if there already a DR and BDR on the network if any is going to accept them.

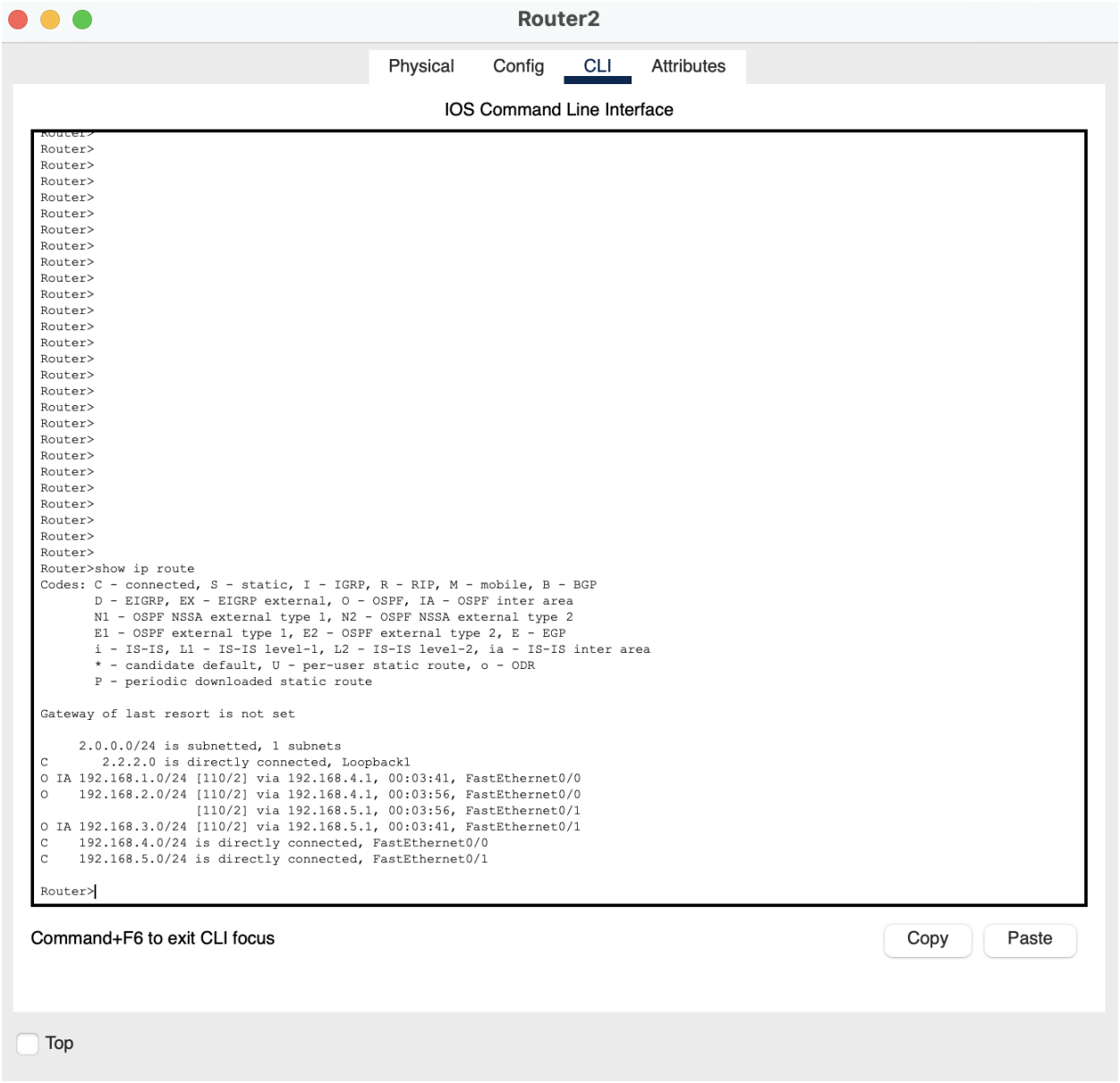
Retransmit - specifies the length time in seconds that the routing device waits to receive an LSA packet before retransmitting LSA to an interface neighbor. By default, the routing device retransmits LSA's to its neighbors every 5 seconds range from 1 to 65,535 seconds

4. (1.5 pts) On Router2, execute command "traceroute 192.168.2.1" a few times.

a. How was Router2 routing traffic destined to 192.168.2.1 ? Explain this routing behavior.

Since the router is already in the primary "backbone" OSPF it oscillates between the two router interfaces from one to another.

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



5. (1.5 pts) submit printout of output of “show running-config” of each router.

Router1

Router#show running-config
Building configuration...

Current configuration : 899 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec

```
no service password-encryption
!
hostname Router
!
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback1
ip address 1.1.1.1 255.255.255.0
!
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 Ethernet0/1/0
ip address 192.168.4.1 255.255.255.0
duplex auto
speed auto
!
interface Vlan1
no ip address
shutdown
!
router ospf 1
router-id 1.1.1.1
log-adjacency-changes
network 192.168.1.0 0.0.0.255 area 1
network 192.168.2.0 0.0.0.255 area 0
network 192.168.4.0 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

Router2

Router#show running-config
Building configuration...

Current configuration : 865 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
!
!
!
!
ip cef
no ipv6 cef
!
!
!
!
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!

```
!
!
!
!
interface Loopback1
ip address 2.2.2.2 255.255.255.0
!
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 Vlan1
no ip address
shutdown
!
router ospf 2
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
!
router ospf 1
log-adjacency-changes
network 192.168.1.0 0.0.0.255 area 1
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

Router3

Router#show running-config
Building configuration...

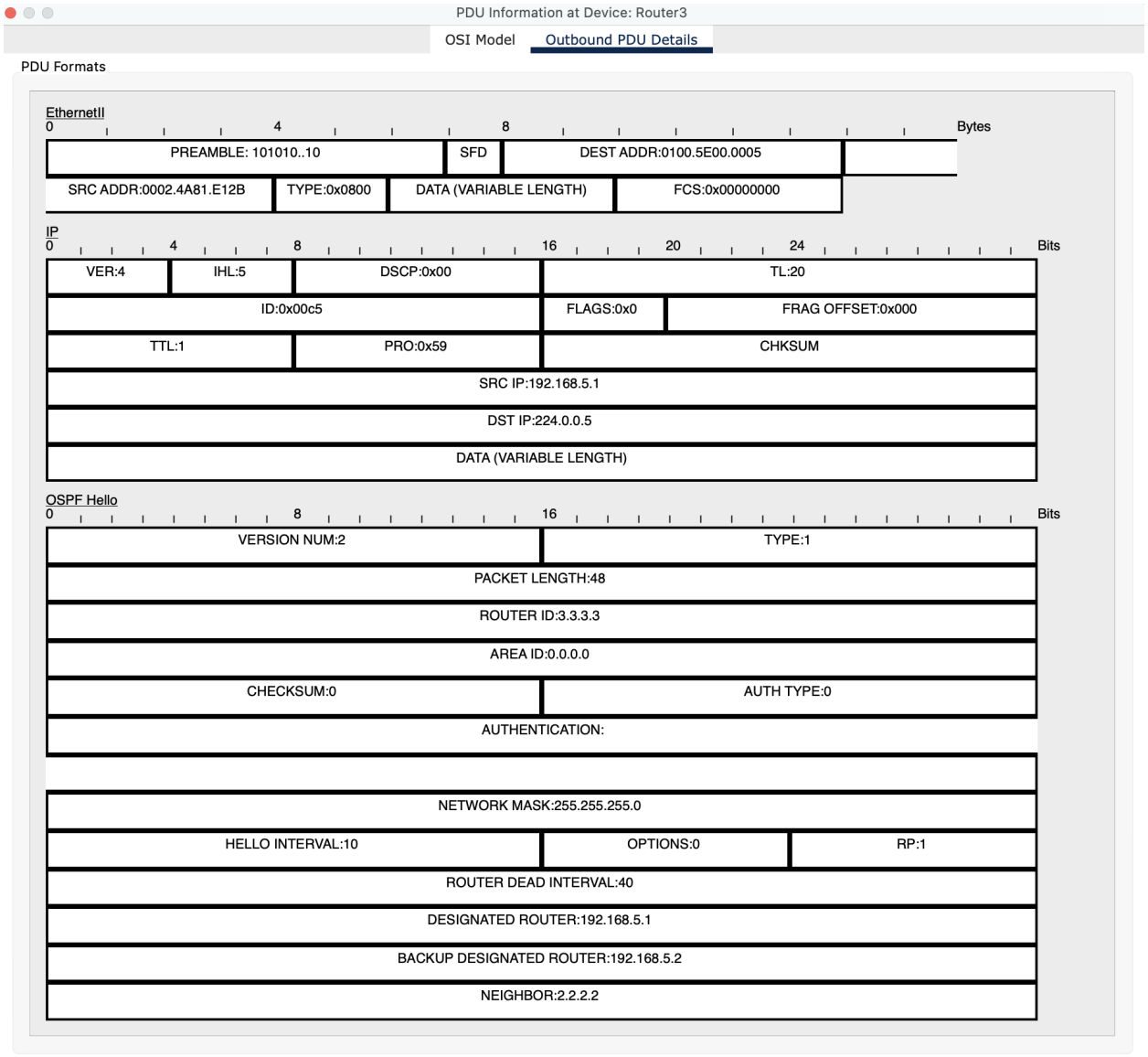
Current configuration : 995 bytes
!
version 12.4
no service timestamps log datetime msec
no service timestamps debug datetime msec
no service password-encryption
!
hostname Router
!
!
!
!
!
!
!
!
no ip cef
no ipv6 cef
!
!
!
!

```
!
!
!
!
!
!
!
!
spanning-tree mode pvst
!
!
!
!
!
!
interface Loopback3
ip address 3.3.3.3 255.255.255.0
!
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 Ethernet0/1/0
ip address 192.168.5.1 255.255.255.0
duplex auto
speed auto
!
interface Vlan1
no ip address
shutdown
!
router ospf 3
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 3
!
router ospf 2
log-adjacency-changes
network 192.168.2.0 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
```

6. (1.5 pts) From simulation mode, capture and decode two different types of OSPF packets (such as Hello and LSU). Submit screenshots of these decoded packets.

I believe both are Hello packets but one is inbound and the other is outbound



PDU Information at Device: Router2

OSI Model | Inbound PDU Details

PDU Formats