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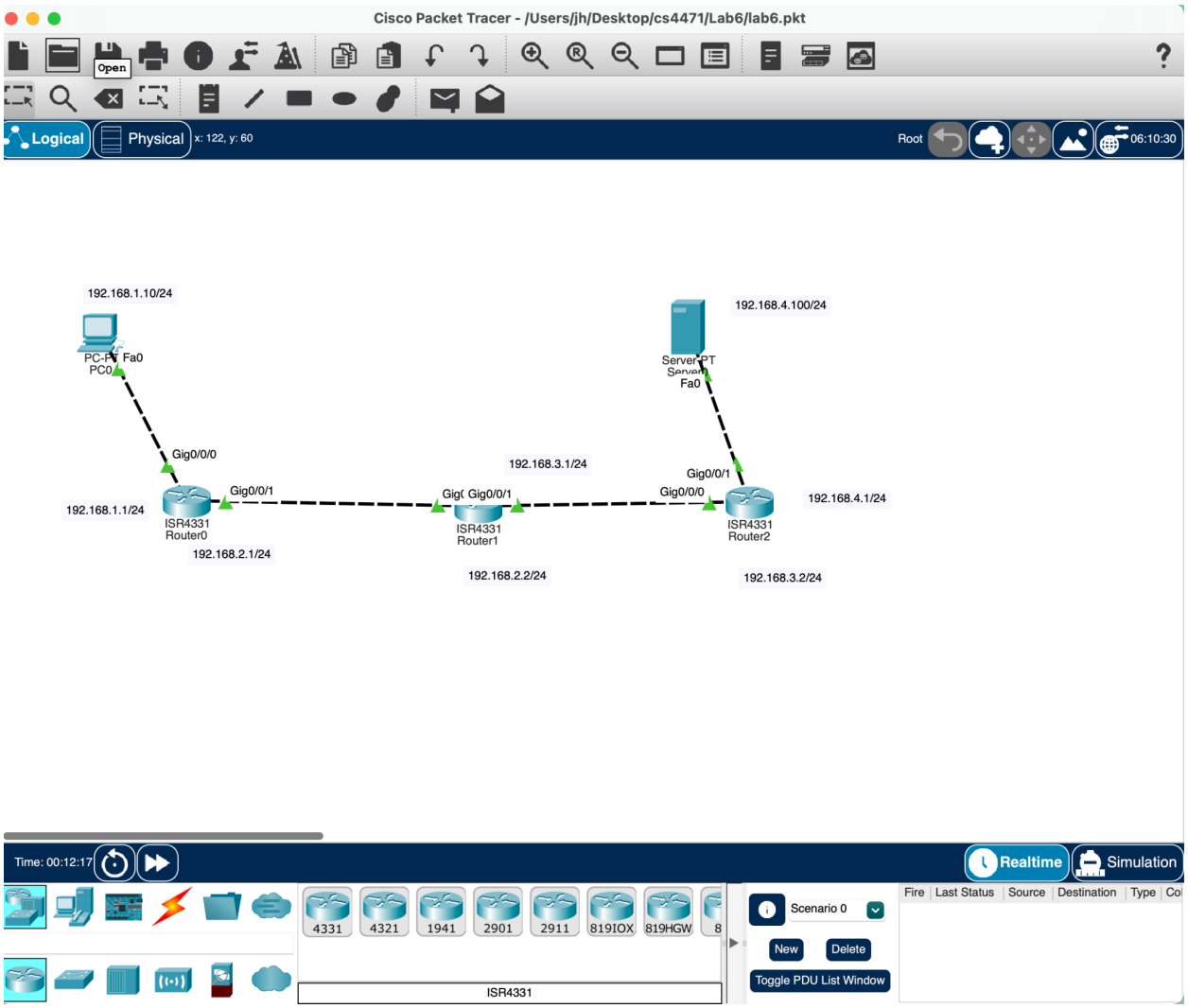
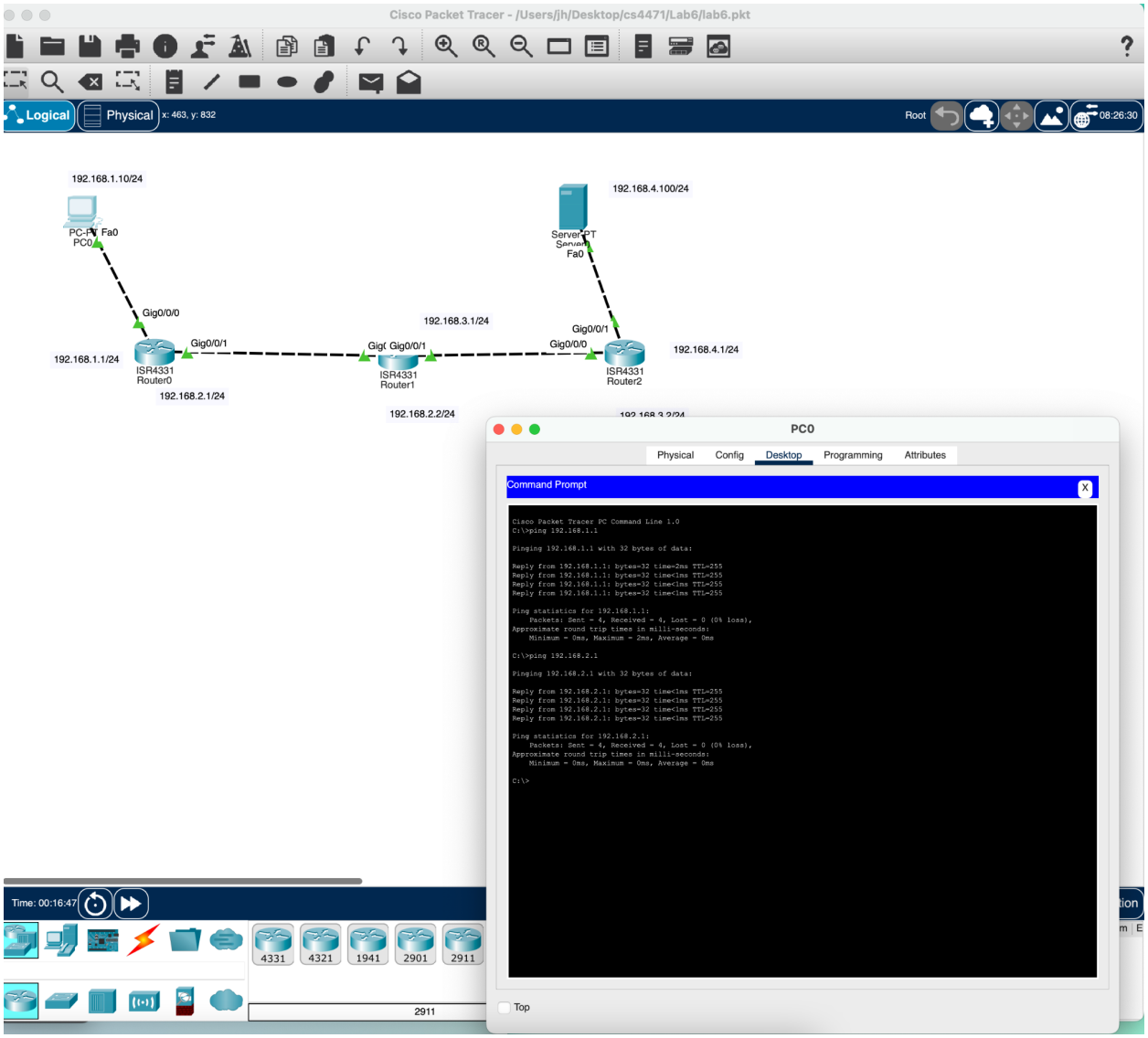
03/23/2022
Computer Science 4471-01

Lab 6 - Static Routing

1. (1pt) Submit a screenshot of your network drawn. Make sure all port labels are shown (options > preferences).

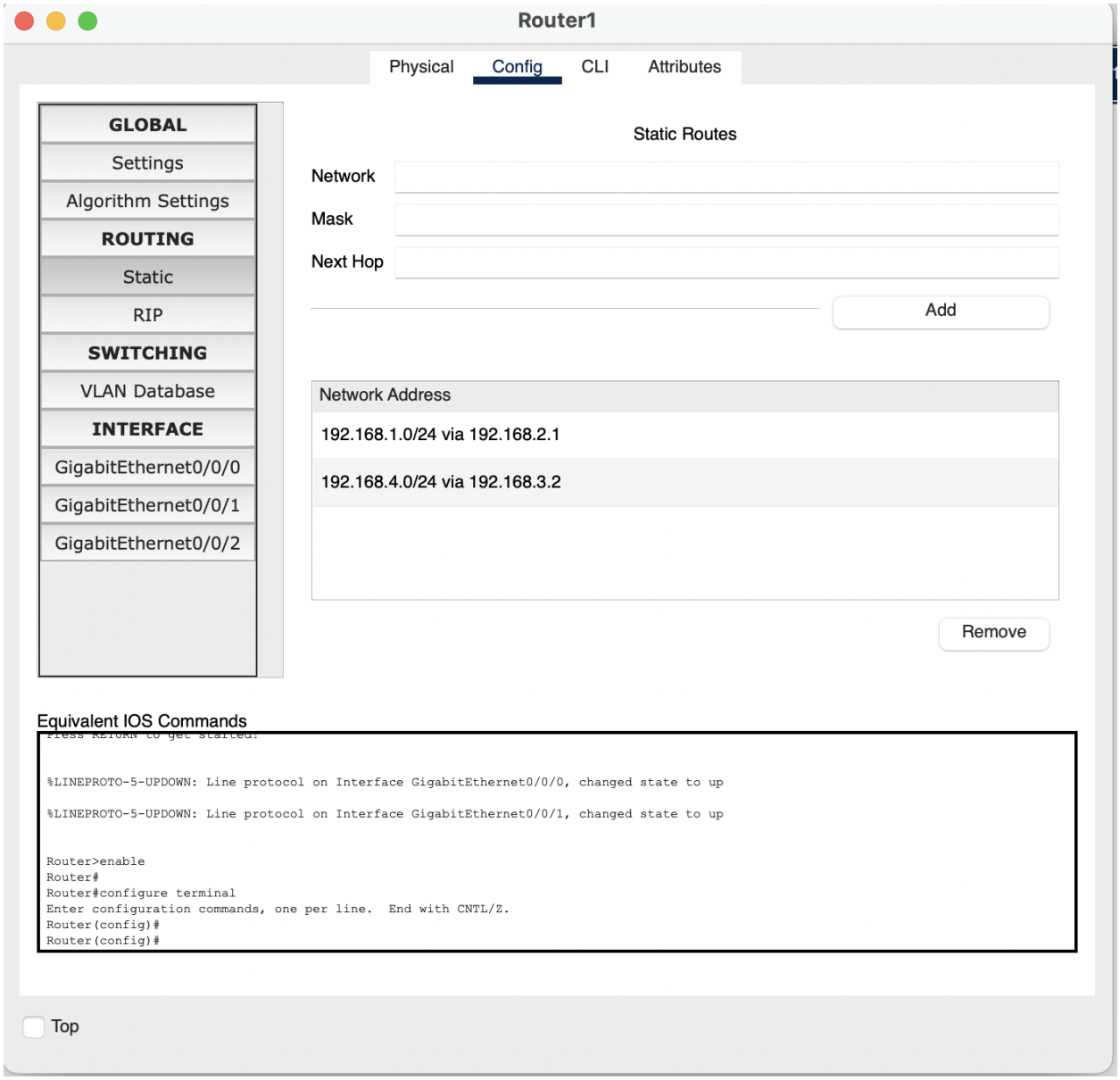


2. (1pt) On PC0, configure IP address, netmask, and default gateway. On Router0, configure IP address and netmask of interface G0/0/0 and G0/0/1. On PC0, submit screenshot(s) showing that PC0 can ping both IP addresses of Router0's network interfaces.

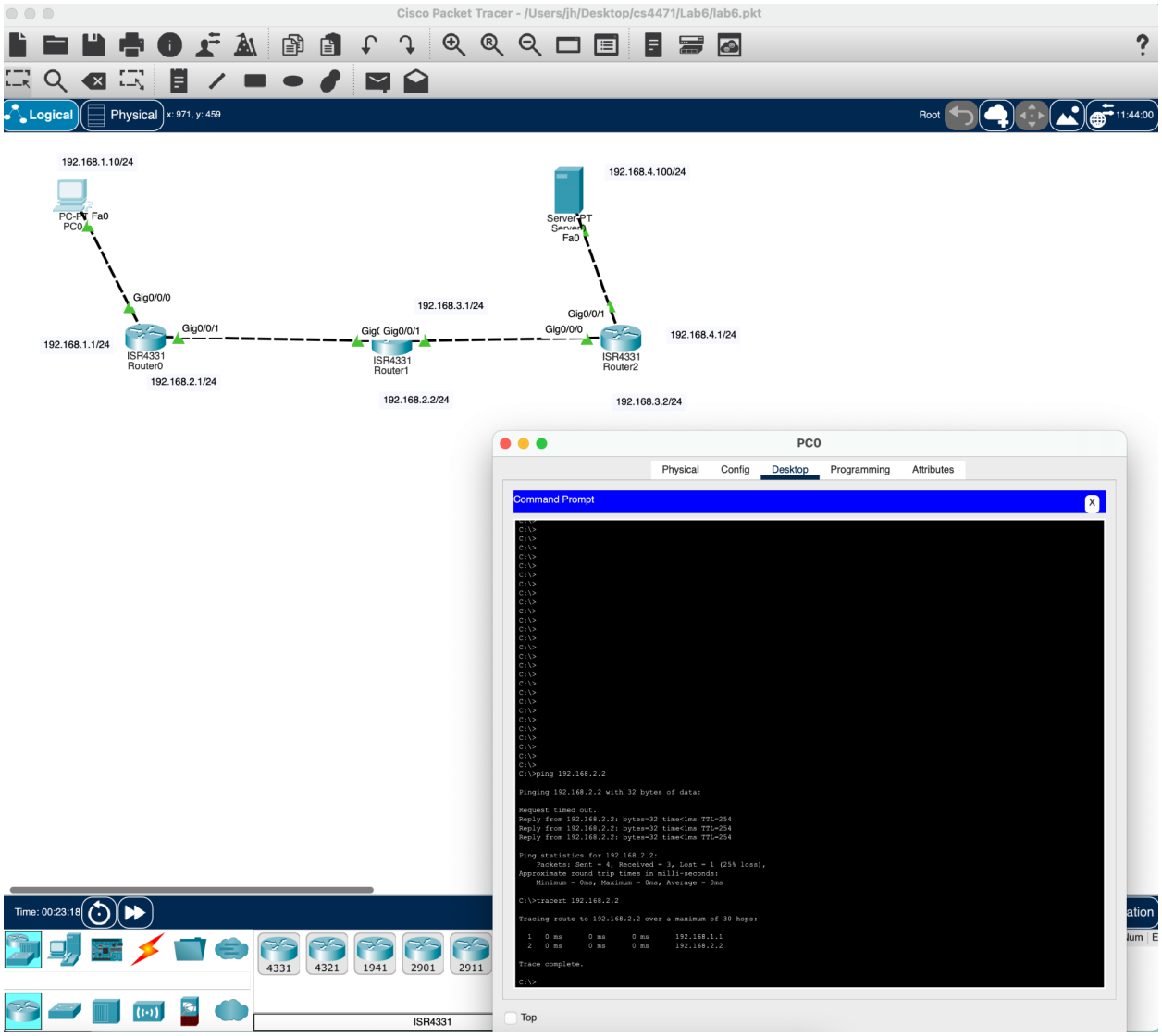


3. (1pt) On Router1, configure its IP address and netmask on both network interfaces. In Simulation mode, note that in the absence of additional routing information on Router1, PC0 cannot successfully ping Router1's IP 192.168.2.2. Add a static route on Router1 so that it knows how to forward IP packets destined for network 192.168.1.0/24.

a. What static route did you have to add on Router1?
   - The static route added to Router1 is
     Network = 192.168.1.0
     Mask = 255.255.255.0
     Next Hop = 192.168.2.1



b. Submit screenshot(s) from PC0 showing that PC0 can successfully ping and traceroute to 192.168.2.2



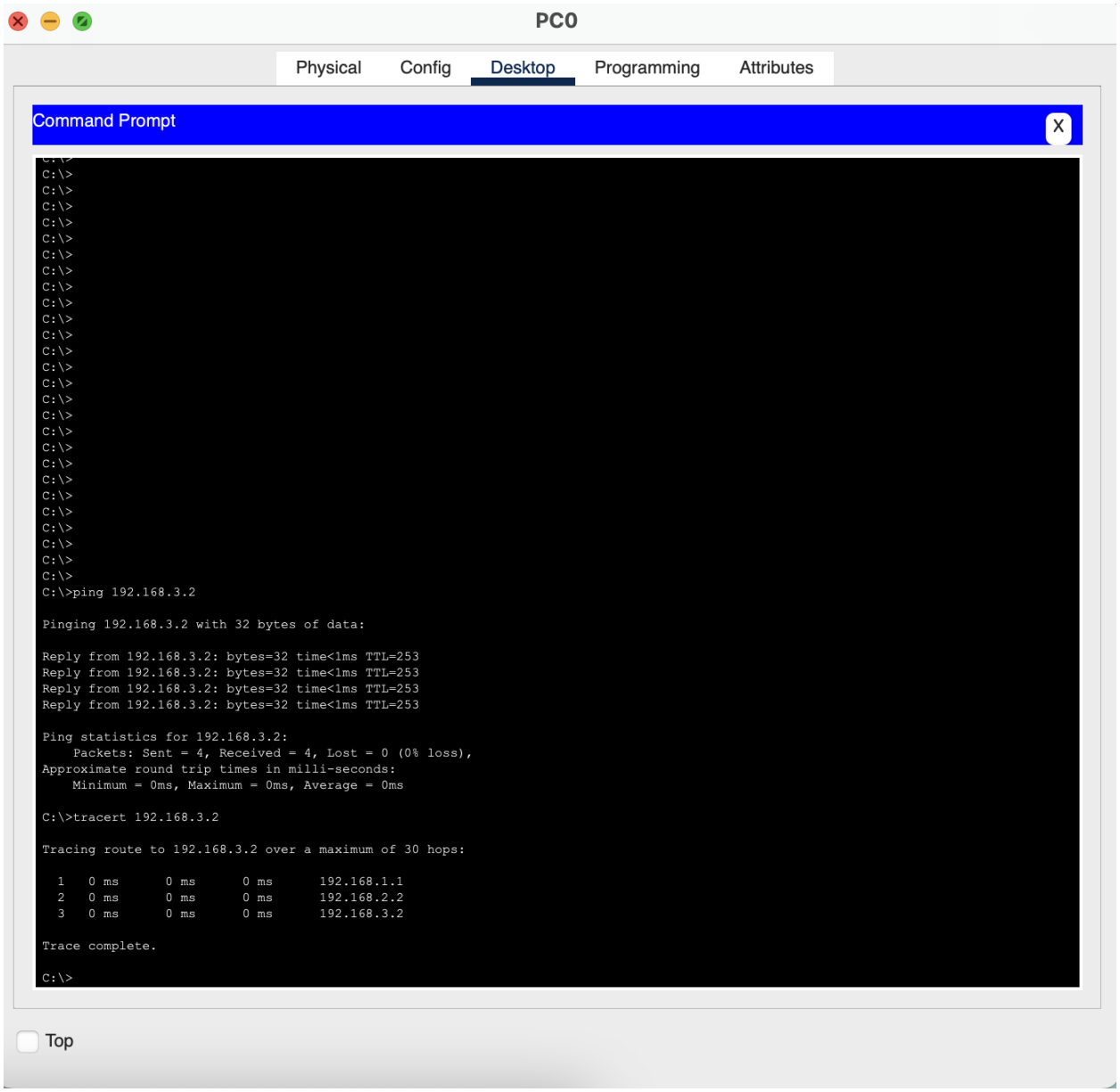
4. (2pt) On Router2, configure its IP address and netmask on both network interfaces. Note that in the absence of additional routing information on the routers, PC0 cannot ping Router2's IP address 192.168.3.2 (Simulation mode should show that the ping packets are being dropped). Configure default static routes on routers Router0 and Router2 in order that PC0 can ping Router2's IP address 192.168.3.2.

a. What default static route did you have to configure on Router0 and Router2?
   - The static route added to Router0 is
     Network = 192.168.3.0
     Mask = 255.255.255.0
     Next Hop = 192.168.2.2

   - The static route added to Router2 is

Network = 192.168.1.0
Mask = 255.255.255.0
Next Hop = 192.168.3.1

b. Submit screenshot(s) from PC0 showing that PC0 showing that PC0 can successfully ping and traceroute to 192.168.3.2.

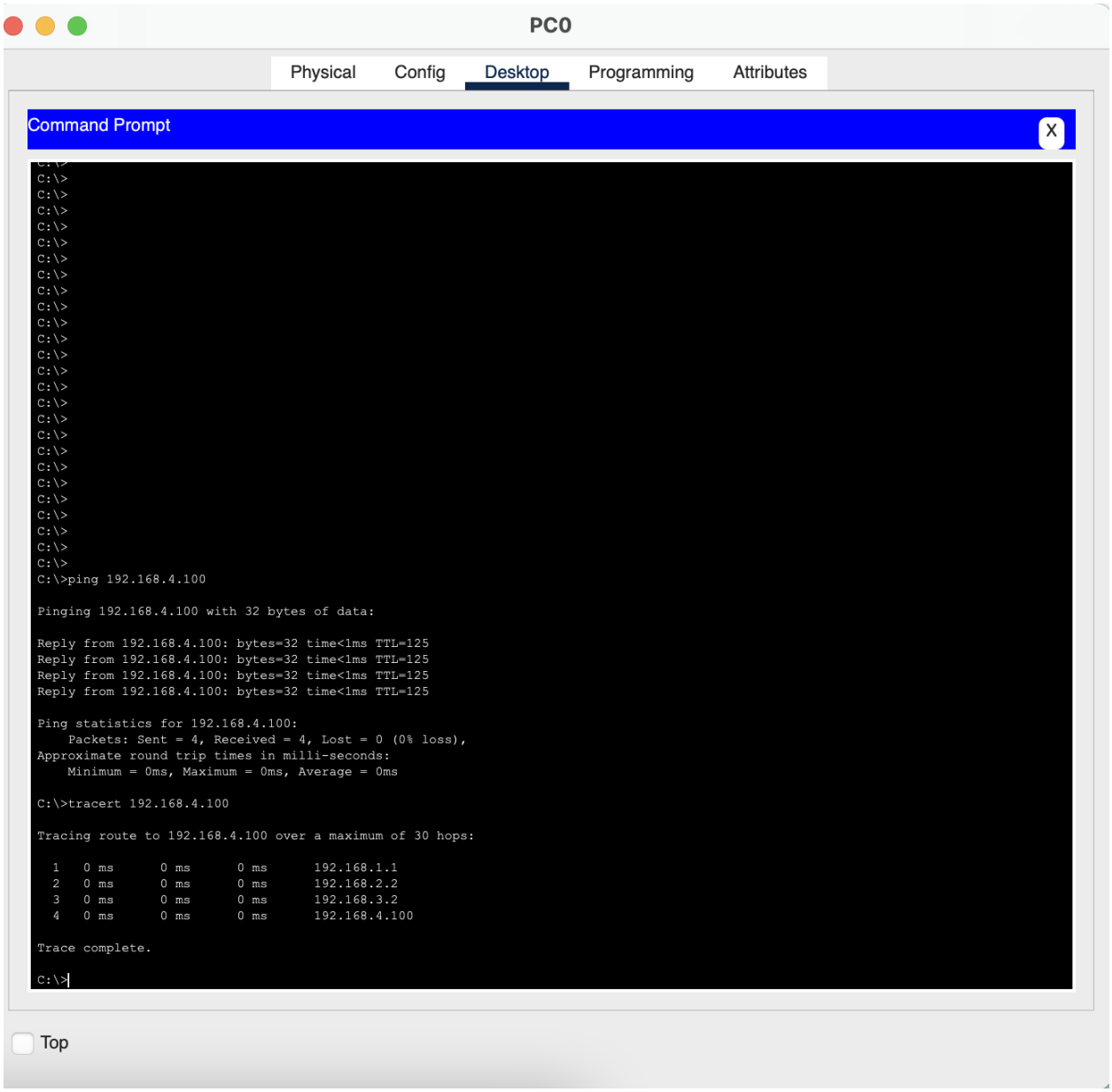


5. (2pts) On Server0, configure its IP address, netmask, and default gateway. In Simulation mode, note that PC0 cannot ping Server0 because one of the routers does not know where to forward the packet. Configure a needed static route on Router0, Router1, or Router2 in order that PC0 can ping Server0's IP address 192.168.4.100.

a. What additional static route did you have to add to a router's configuration? On which router was this static route added?

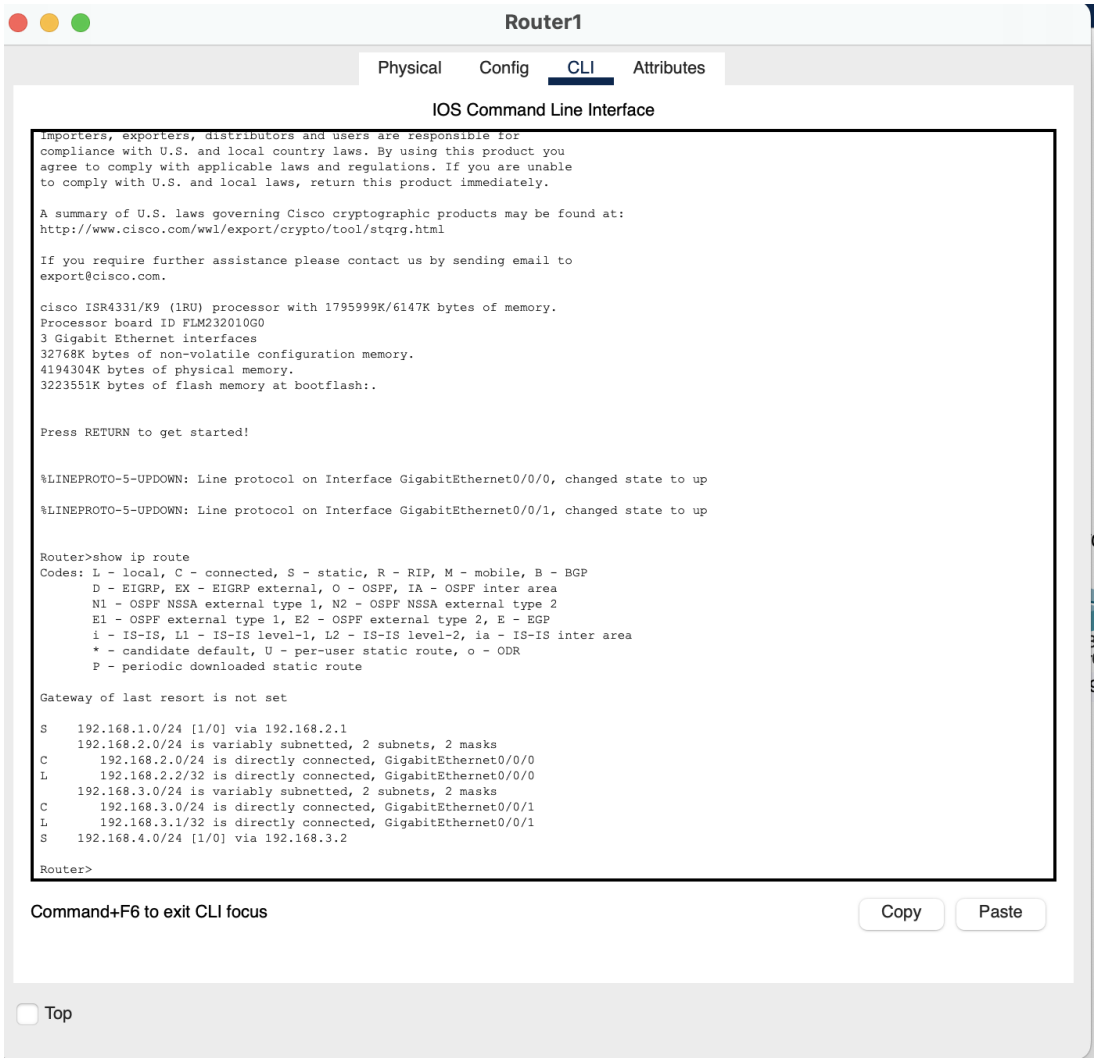
    - On Router0 we added the
    Network = 192.168.4.0
    Mask = 255.255.255.0
    Next Hop = 192.168.3.1

b. Submit screenshot(s) from PC0 showing that PC0 can successfully traceroute to 192.168.4.100.



6. (1.5pts) On each of the three routers submit screenshots of output of “show ip route”. Note that the routing tables should show how each router will forward IP packets destined to different subnets


Router0
Physical
Config
CLI
Attributes
IOS Command Line Interface
Importers, exporters, distributors and users are responsible for
compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.
A summary of U.S. laws governing Cisco cryptographic products may be found at:
http://www.cisco.com/wwl/export/crypto/tool/stqrg.html
If you require further assistance please contact us by sending email to
export@cisco.com.
cisco ISR4331/K9 (1RU) processor with 1795999K/6147K bytes of memory.
Processor board ID FLM232010G0
3 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
3223551K bytes of flash memory at bootflash:.
Press RETURN to get started!
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0/1, changed state to up
Router>show 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
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.1.0/24 is directly connected, GigabitEthernet0/0/0
L 192.168.1.1/32 is directly connected, GigabitEthernet0/0/0
192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.2.0/24 is directly connected, GigabitEthernet0/0/1
L 192.168.2.1/32 is directly connected, GigabitEthernet0/0/1
S 192.168.3.0/24 [1/0] via 192.168.2.2
S 192.168.4.0/24 [1/0] via 192.168.3.1
Router>
Command+F6 to exit CLI focus
Copy
Paste
Top


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
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compliance with U.S. and local country laws. By using this product you
agree to comply with applicable laws and regulations. If you are unable
to comply with U.S. and local laws, return this product immediately.
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http://www.cisco.com/wwl/export/crypto/tool/stqrg.html
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Press RETURN to get started!
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Router>show ip route
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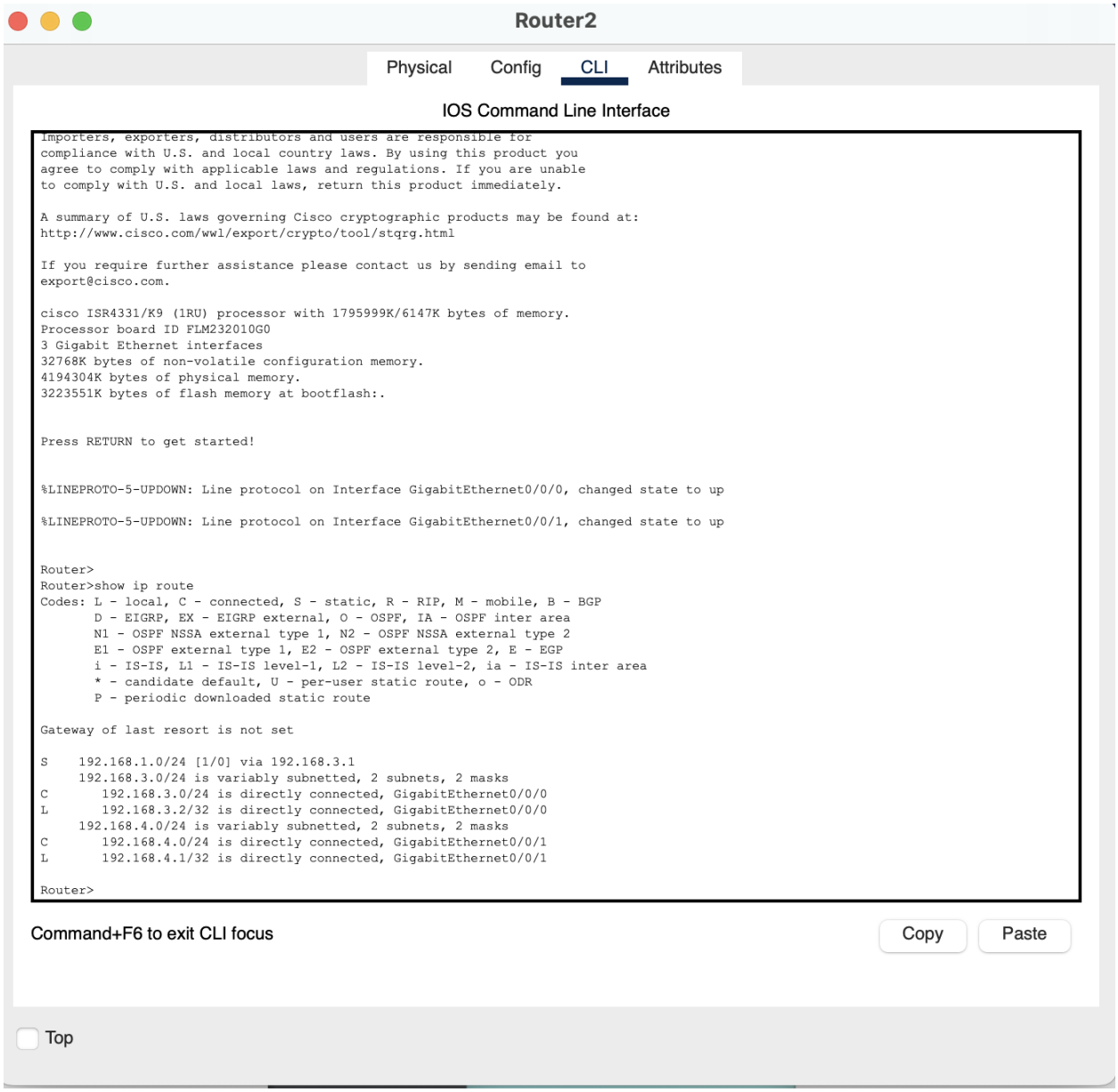
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route
Gateway of last resort is not set
S 192.168.1.0/24 [1/0] via 192.168.2.1
192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.2.0/24 is directly connected, GigabitEthernet0/0/0
L 192.168.2.2/32 is directly connected, GigabitEthernet0/0/0
192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.3.0/24 is directly connected, GigabitEthernet0/0/1
L 192.168.3.1/32 is directly connected, GigabitEthernet0/0/1
S 192.168.4.0/24 [1/0] via 192.168.3.2
Router>
Command+F6 to exit CLI focus
Copy
Paste
Top



7. (1.5pts) Submit the entire configuration file of each of the three routers (copy and paste output of “show running-config”).

Router0

Router#show running-config
Building configuration...

Current configuration : 781 bytes
!
version 15.4

```
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 GigabitEthernet0/0/0
ip address 192.168.1.1 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/0/1
```

```
ip address 192.168.2.1 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Vlan1
no ip address
shutdown
!
router rip
!
ip classless
ip route 192.168.3.0 255.255.255.0 192.168.2.2
ip route 192.168.4.0 255.255.255.0 192.168.3.1
!
ip flow-export version 9
!
!
!
!
!
!
!
!
line con 0
!
line aux 0
!
line vty 0 4
login
!
!
!
end
```

Router1

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

Current configuration : 781 bytes
!
version 15.4
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 GigabitEthernet0/0/0
ip address 192.168.2.2 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/0/1
ip address 192.168.3.1 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Vlan1
no ip address
shutdown
!
router rip
!
ip classless
ip route 192.168.1.0 255.255.255.0 192.168.2.1
ip route 192.168.4.0 255.255.255.0 192.168.3.2
!
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 : 733 bytes
!
version 15.4
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 GigabitEthernet0/0/0
ip address 192.168.3.2 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/0/1
ip address 192.168.4.1 255.255.255.0
duplex auto
speed auto
!
interface GigabitEthernet0/0/2
no ip address
duplex auto
speed auto
shutdown
!
interface Vlan1
no ip address
shutdown
!
router rip
!
ip classless
ip route 192.168.1.0 255.255.255.0 192.168.3.1
!
ip flow-export version 9
!
!
!
!
!
```

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