CSE 1004

NETWORK AND COMMUNICATION

THEORY DIGITAL ASSIGNMENT

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REG NO. – 19BCB0015

SLOT – D2+TD2

SUBMITTED TO – DR. JAISANKAR N

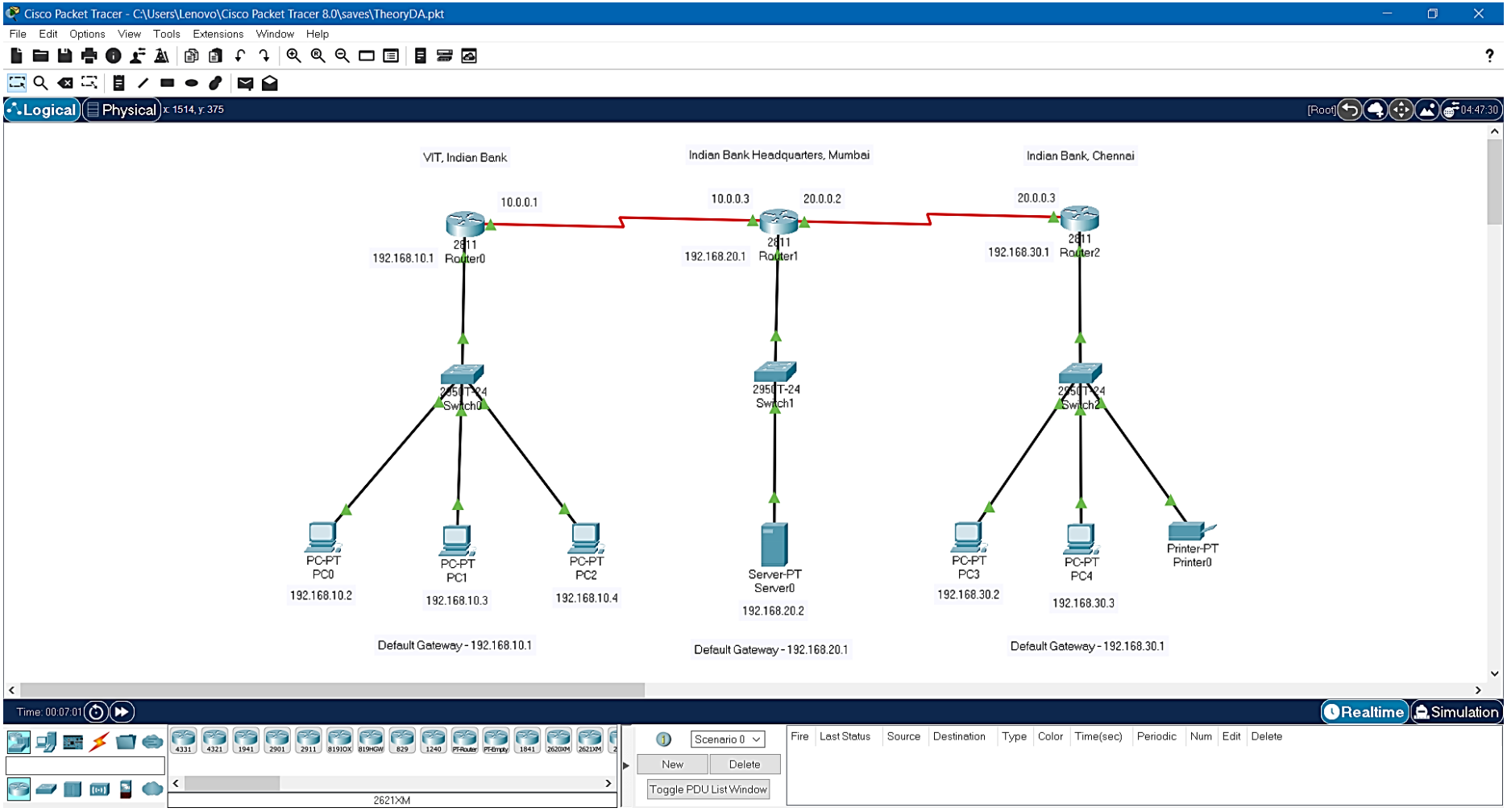
Implement any of networking concepts using cisco packet tracer or wireshark.

QUESTION 1:

Using Cisco Packet Tracer, design a network as stated:

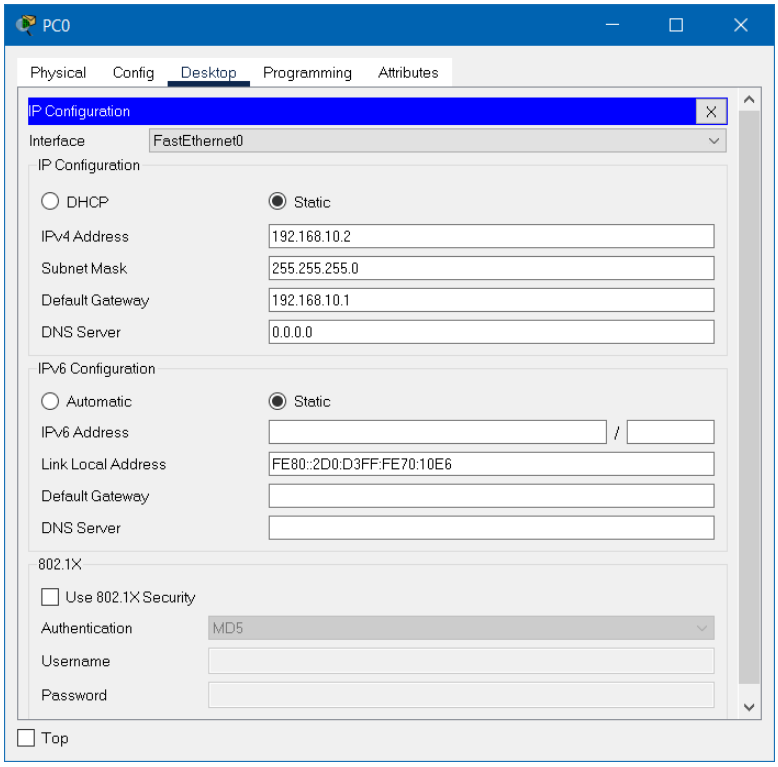
Suppose, you are the network admin of VIT, Indian Bank. The headquarters of Indian bank is located in Mumbai. There is another branch located in Chennai. Both the VIT branch and the Chennai branch has to be connected to the headquarters. Create a network between these three branches. Assume, VIT Indian Bank has three PCs. The headquarters has one server. At Chennai branch it has 2 PCs and a printer. Communication between Chennai branch and VIT branch is through the headquarters in Mumbai

1) Screen shot of the designed network

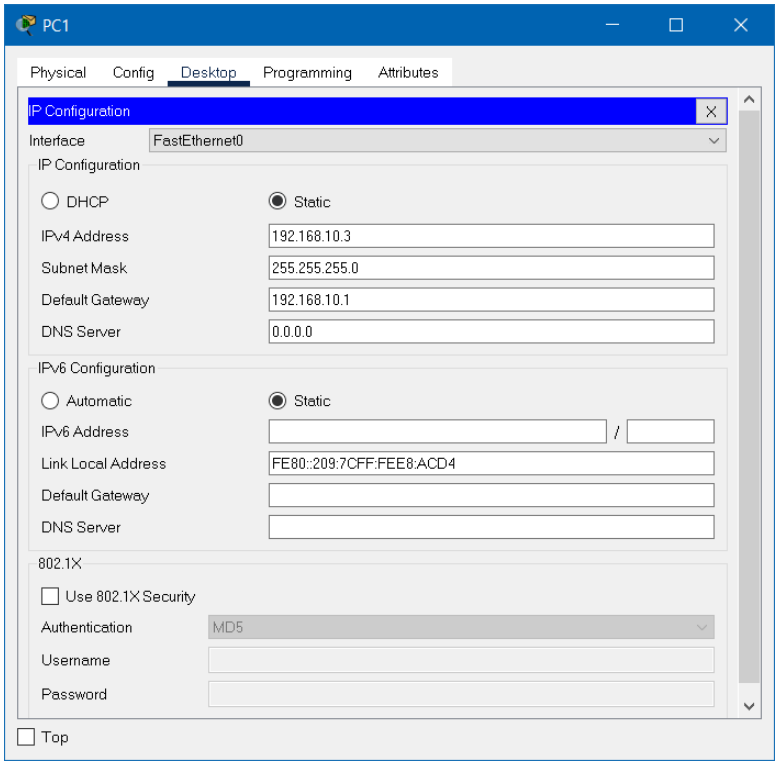


2) IP address configuration with default gateway for all PCs.

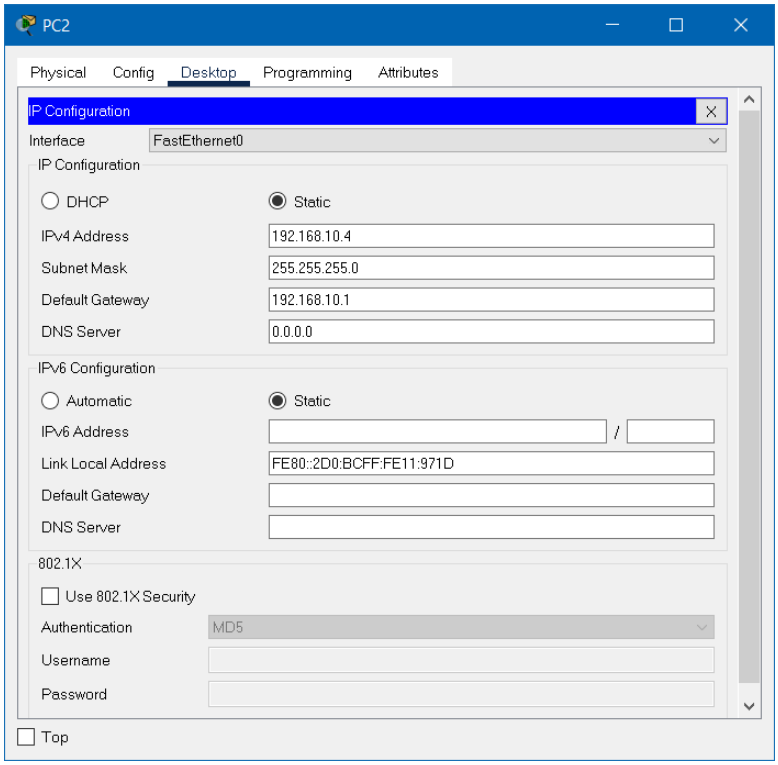
PC0:



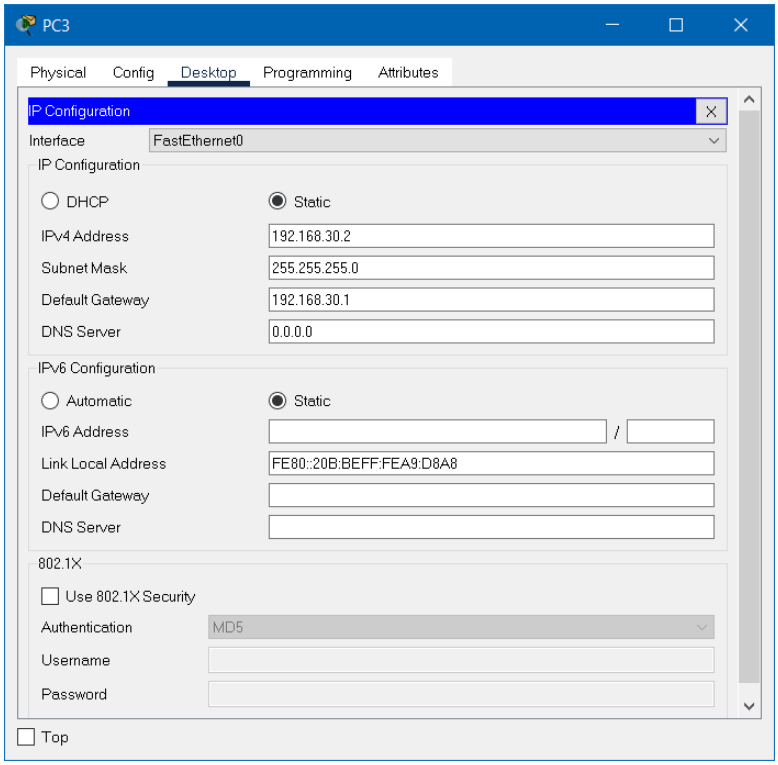
PC1:



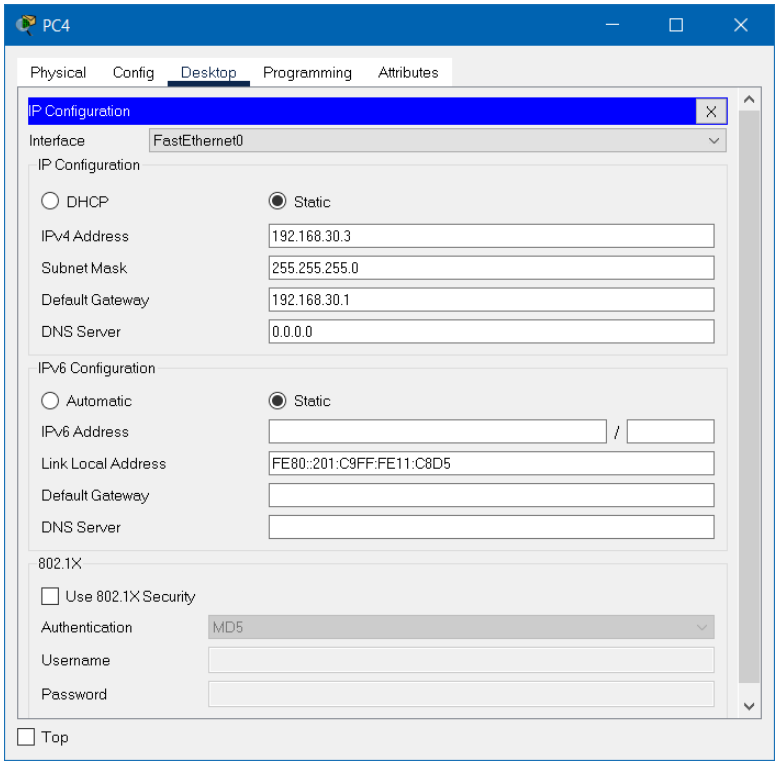
PC2:


PC2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.10.4
Subnet Mask
255.255.255.0
Default Gateway
192.168.10.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2D0:BCFF:FE11:971D
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

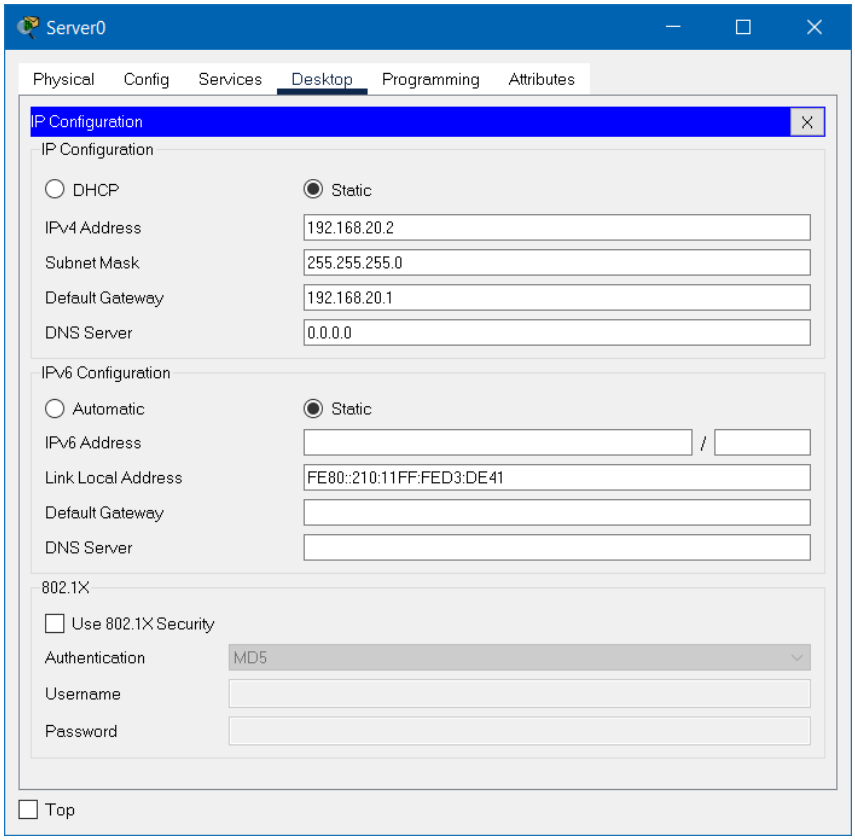
PC3:


PC3
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.30.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.30.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::20B:BEFF:FEA9:D8A8
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

PC4:

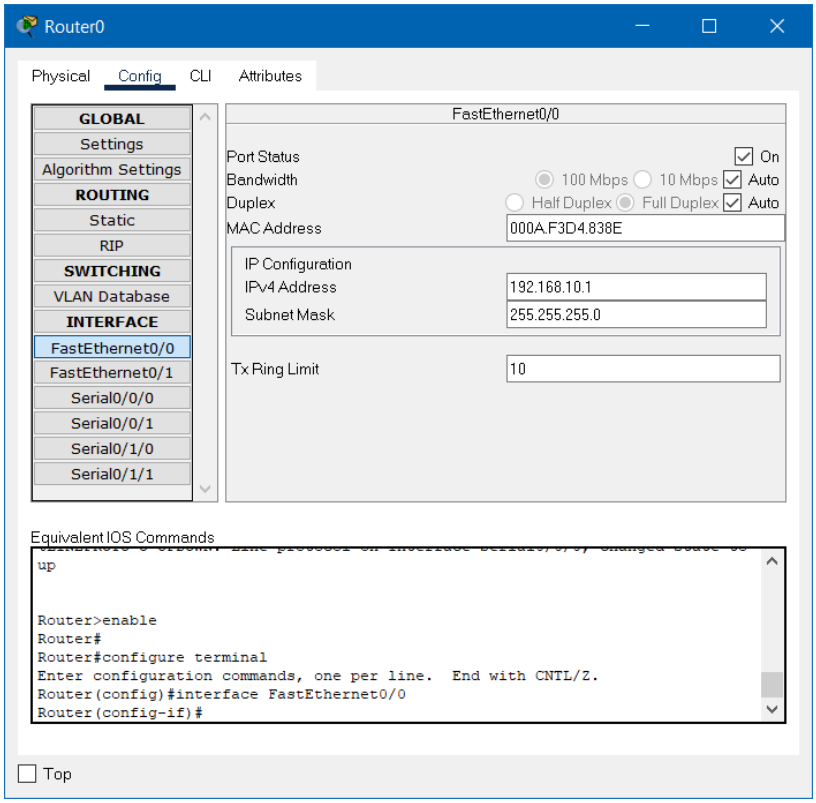


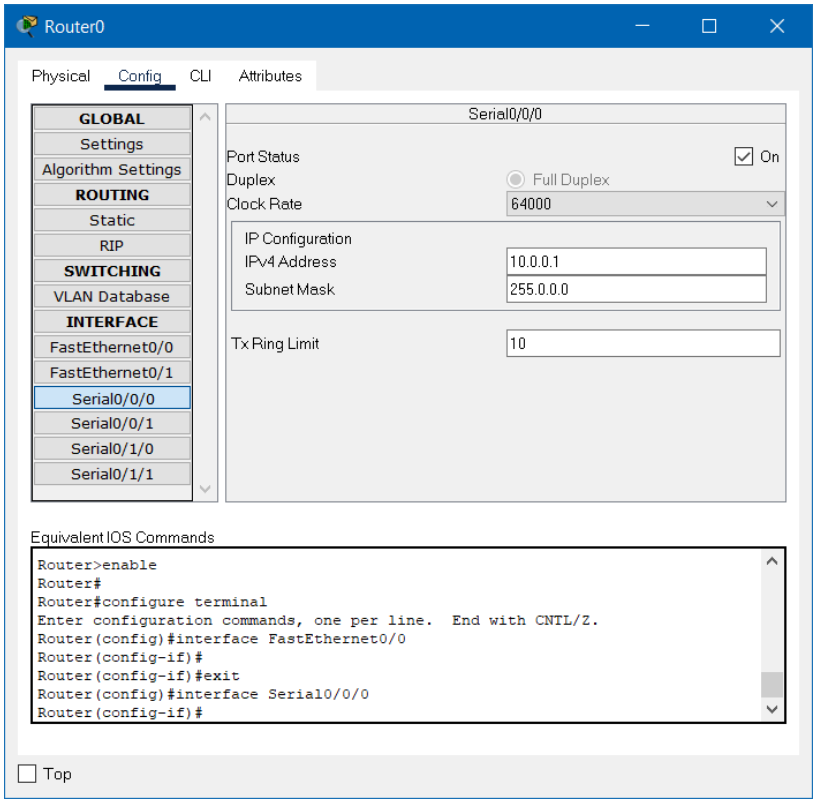
FOR Server0:



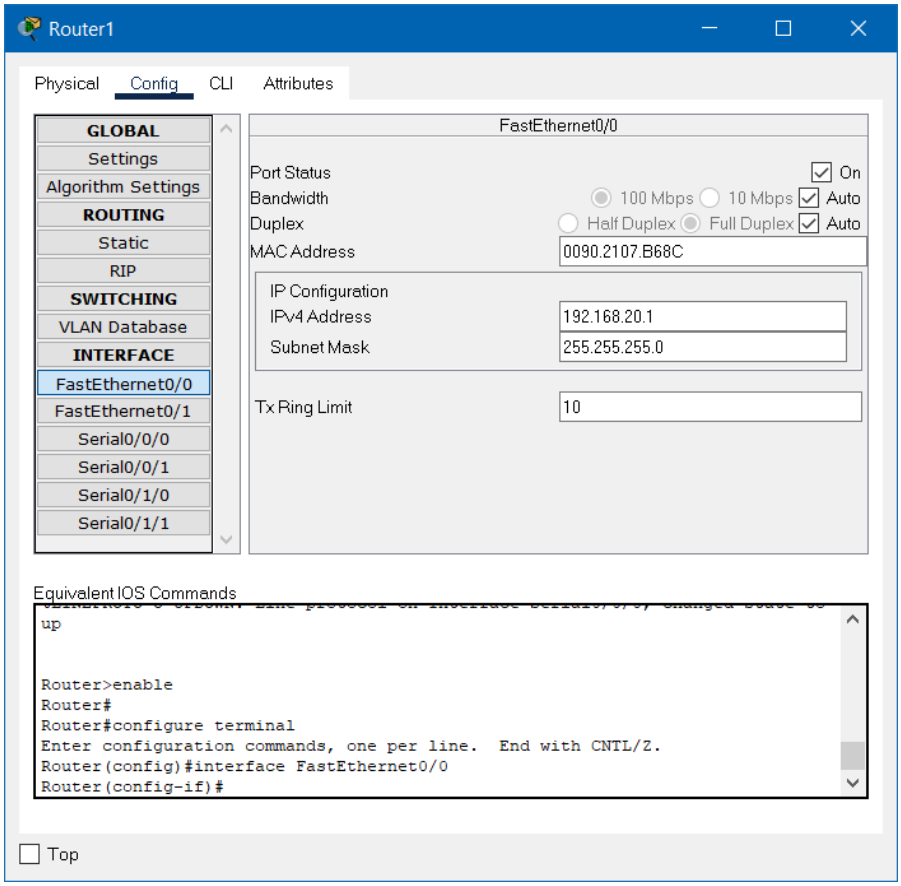
3) IP Configuration of Routers.

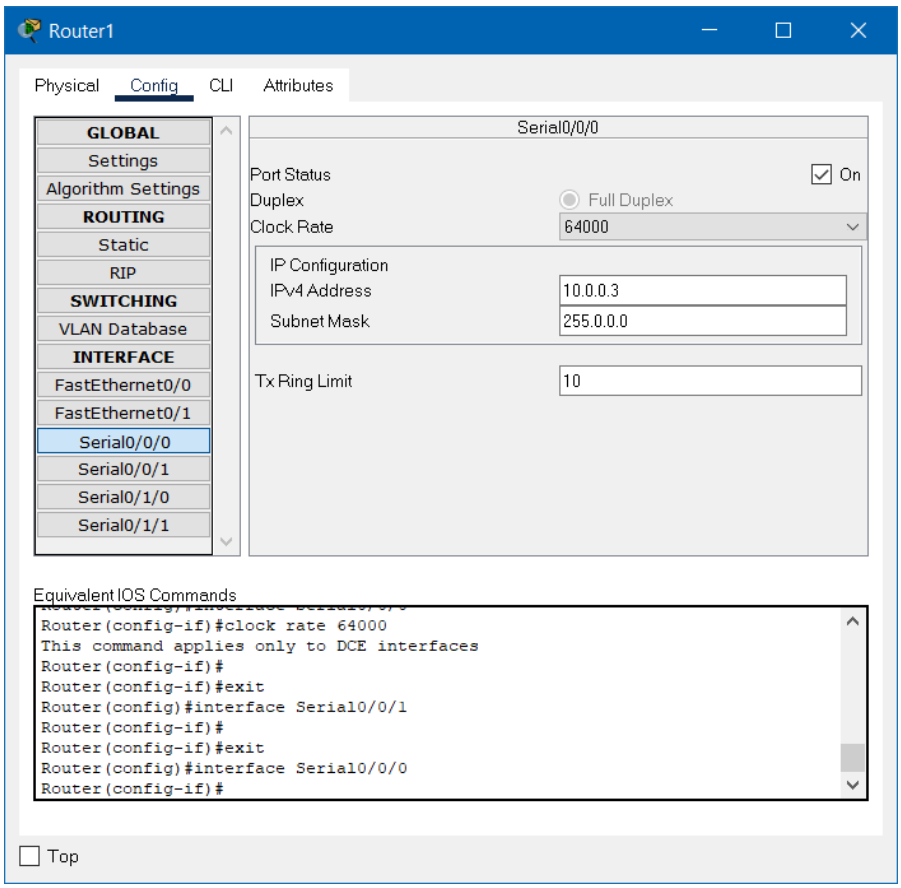
Router0:





Router1:


Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0090.2107.B68C
IP Configuration
IPv4 Address
192.168.20.1
Subnet Mask
255.255.255.0
Tx Ring Limit
10
Equivalent IOS Commands
up
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Top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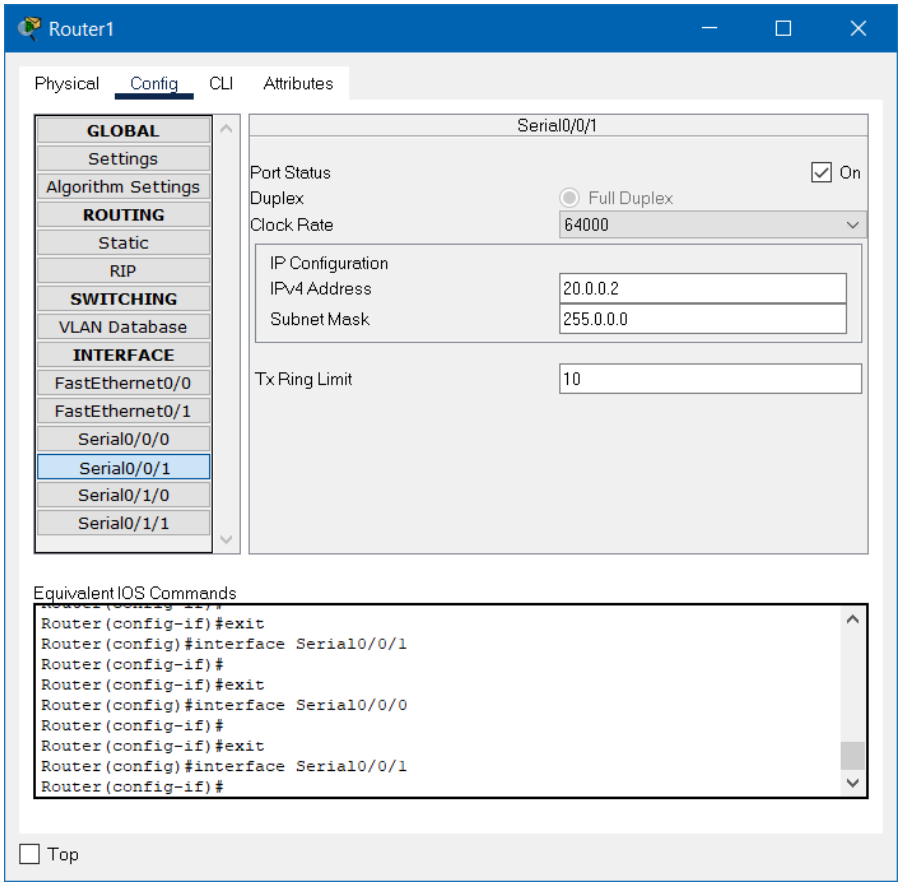
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
Serial0/0/0
Port Status
On
Duplex
Full Duplex
Clock Rate
64000
IP Configuration
IPv4 Address
10.0.0.3
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config-if)#clock rate 64000
This command applies only to DCE interfaces
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Top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FastEthernet0/0
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Serial0/0/1
Serial0/1/0
Serial0/1/1
Serial0/0/1
Port Status
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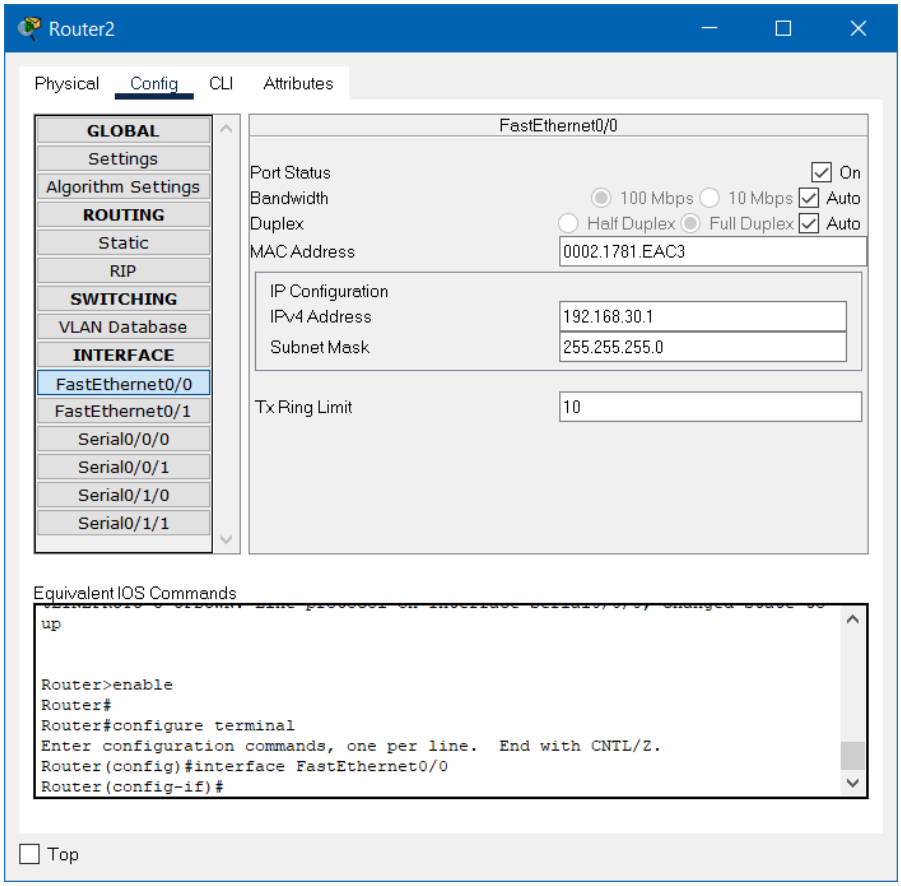
Duplex
Full Duplex
Clock Rate
64000
IP Configuration
IPv4 Address
20.0.0.2
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#
Top

Router2: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Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0002.1781.EAC3
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IPv4 Address
192.168.30.1
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Equivalent IOS Commands
up
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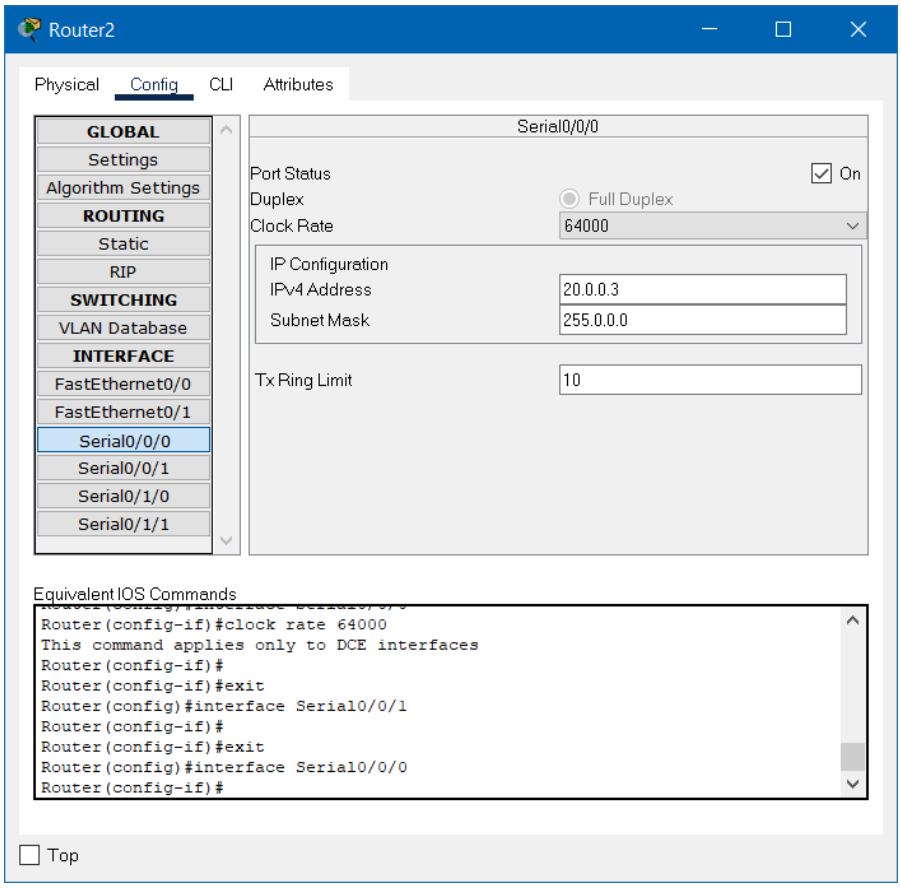
Router2
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Algorithm Settings
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INTERFACE
FastEthernet0/0
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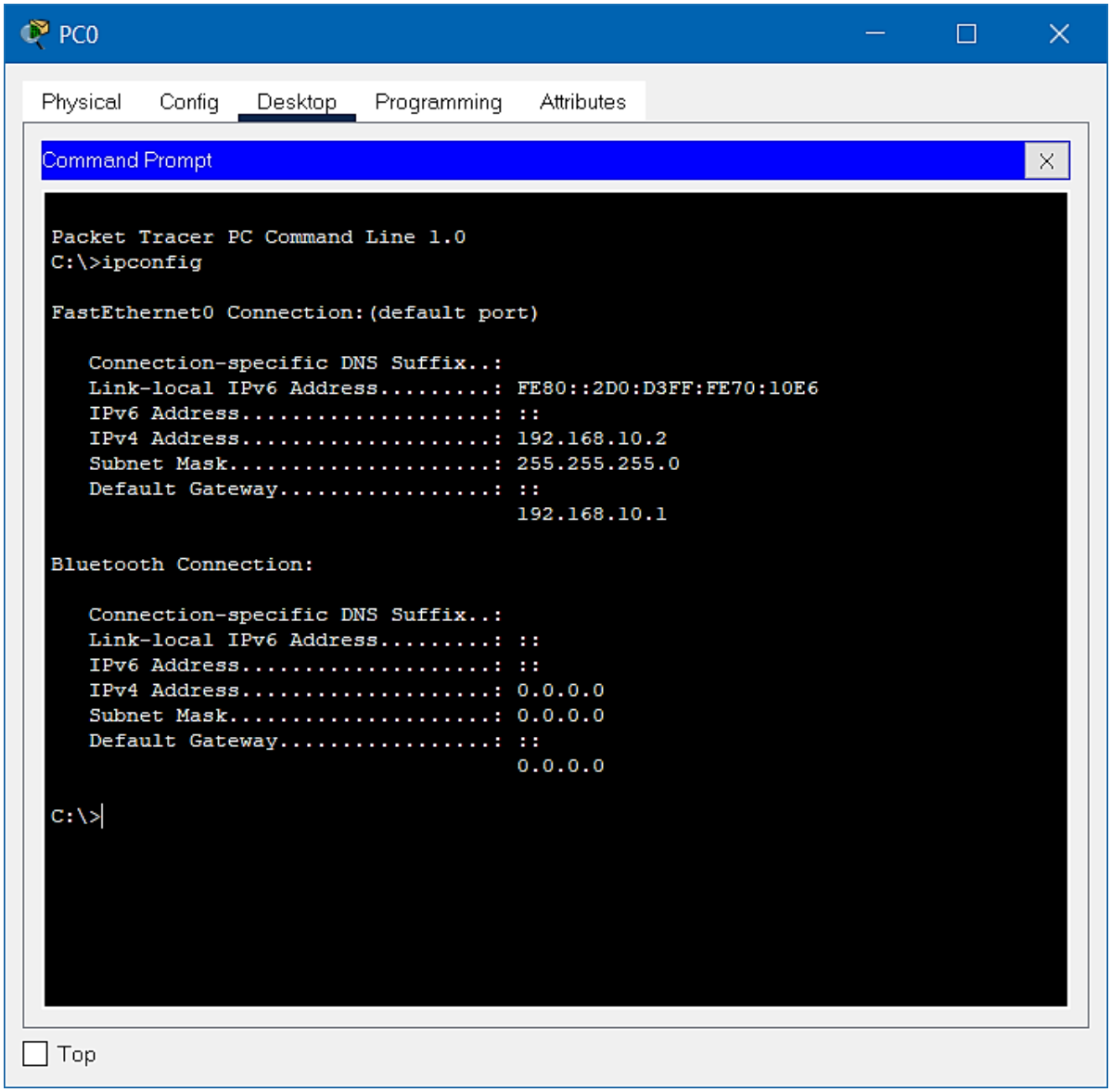
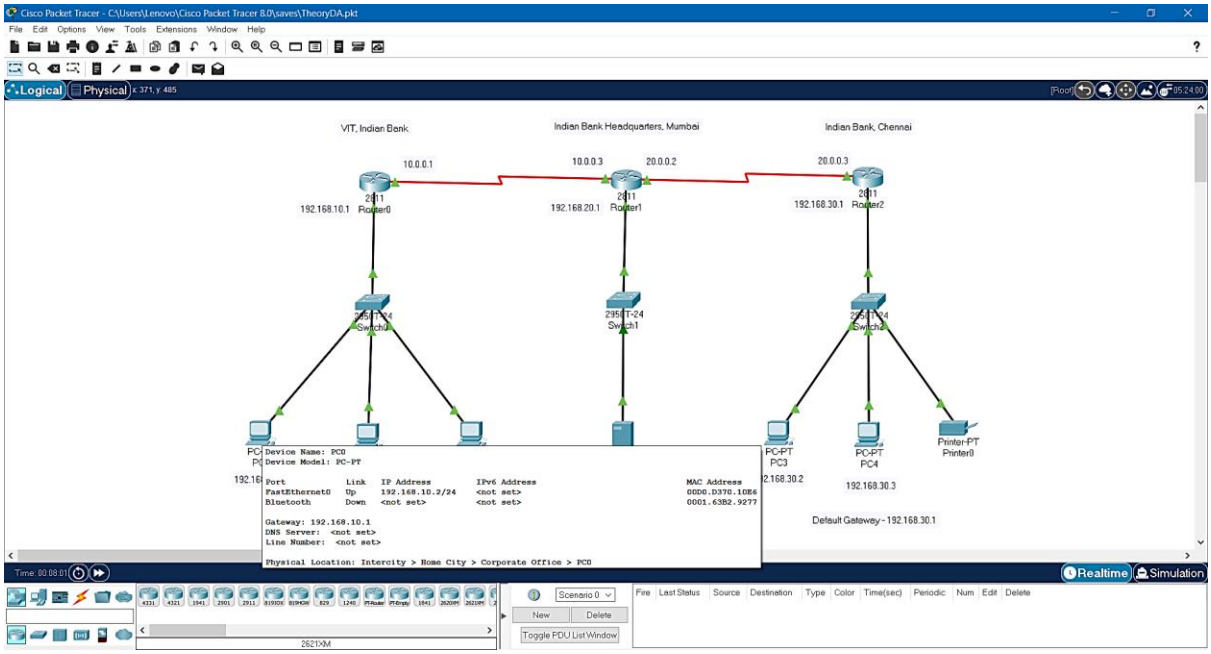
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Top

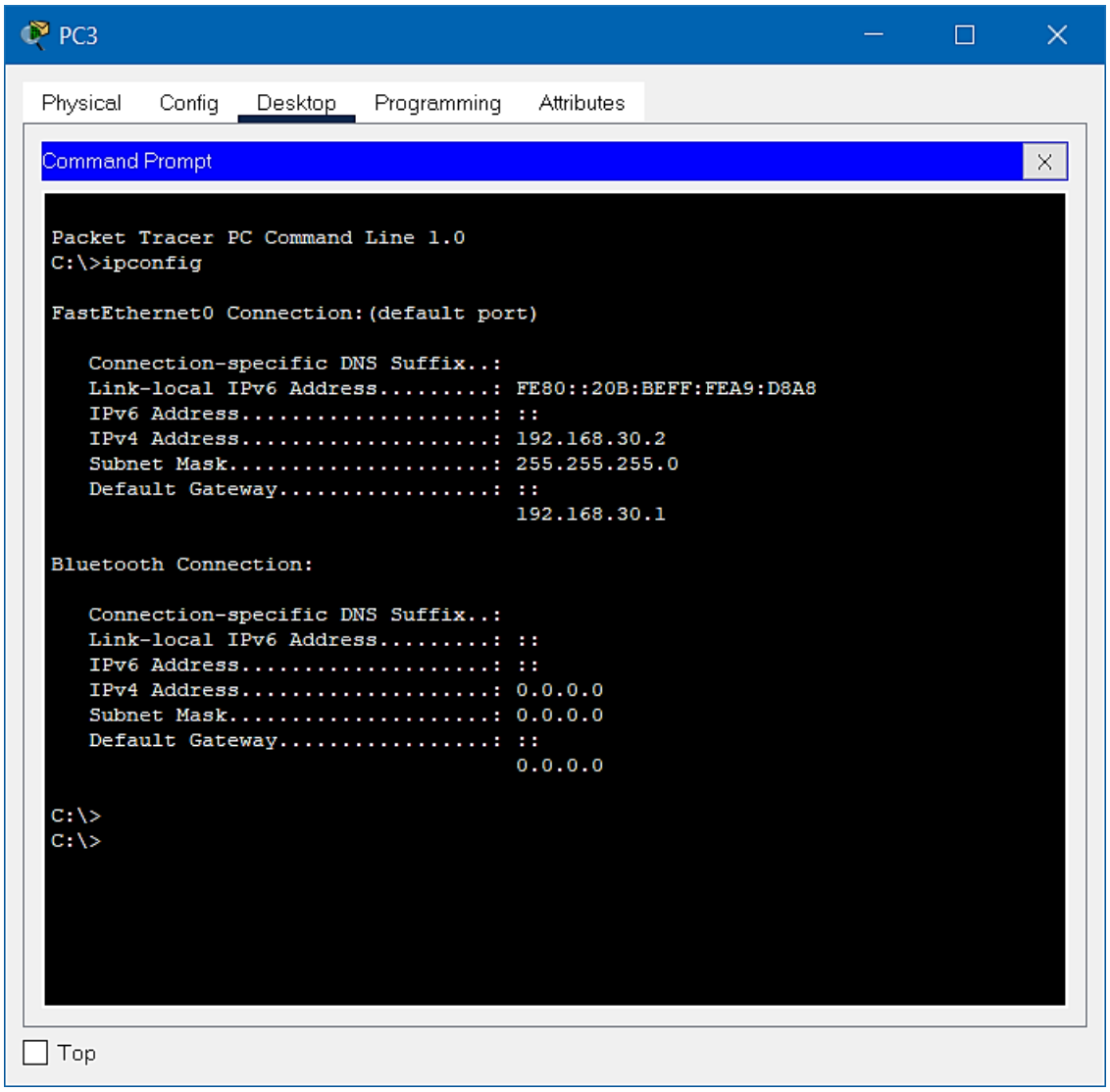
4) Collect the IPV4 information of PCs using ipconfig.

PC0 in VIT, Indian Bank:

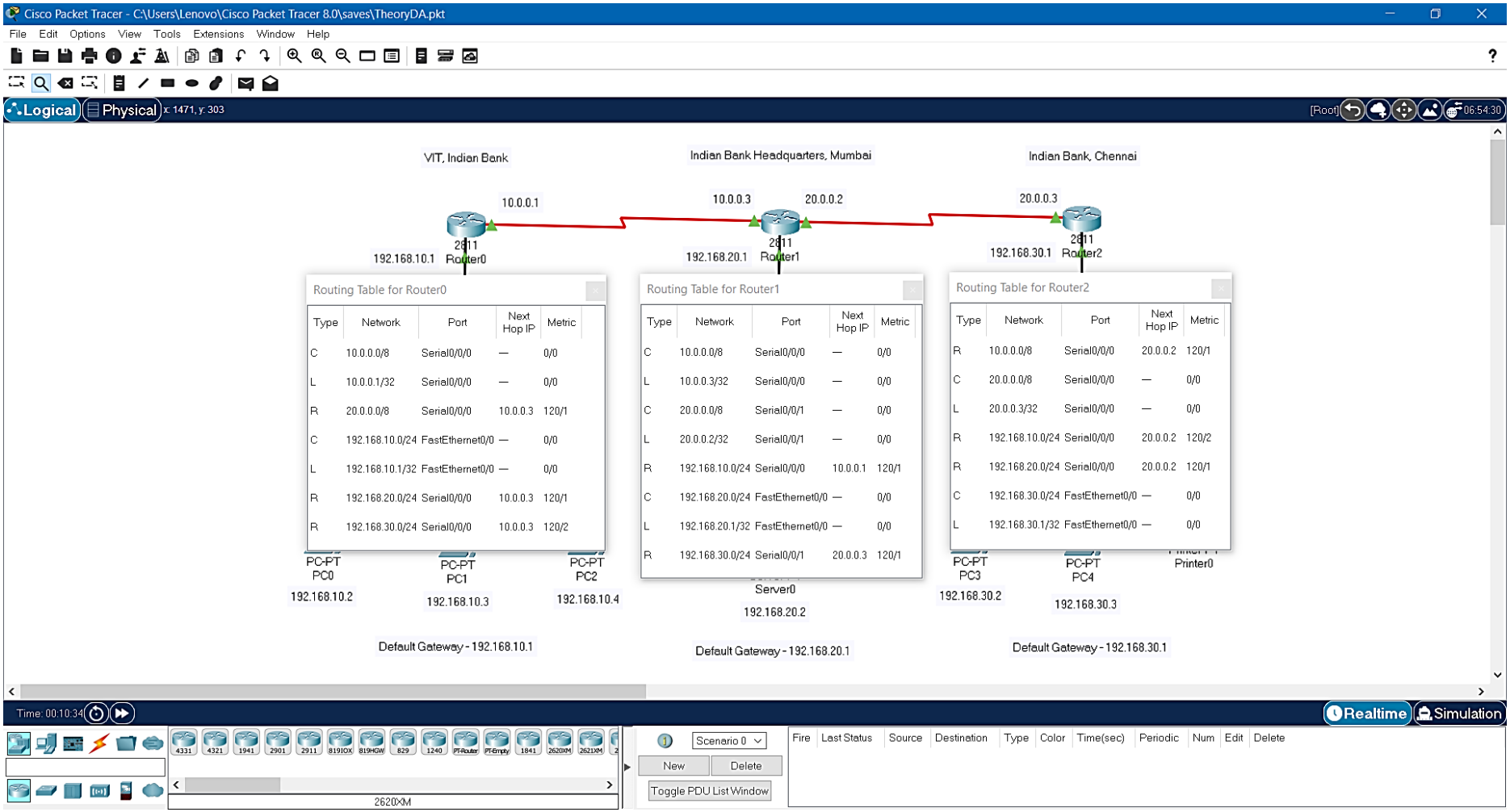




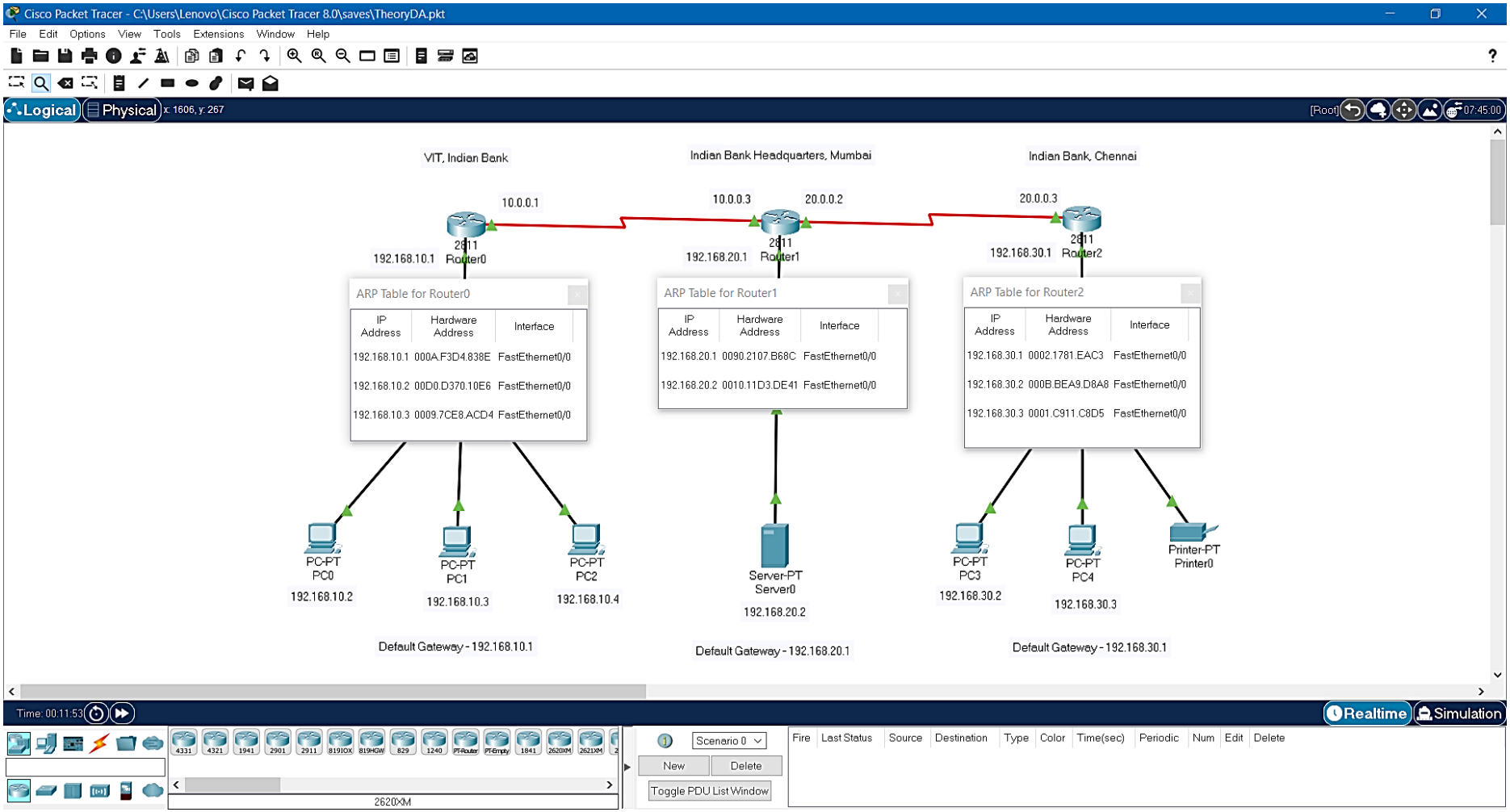
PC3 in Indian Bank, Chennai:



5) Display the routing tables for the routers.

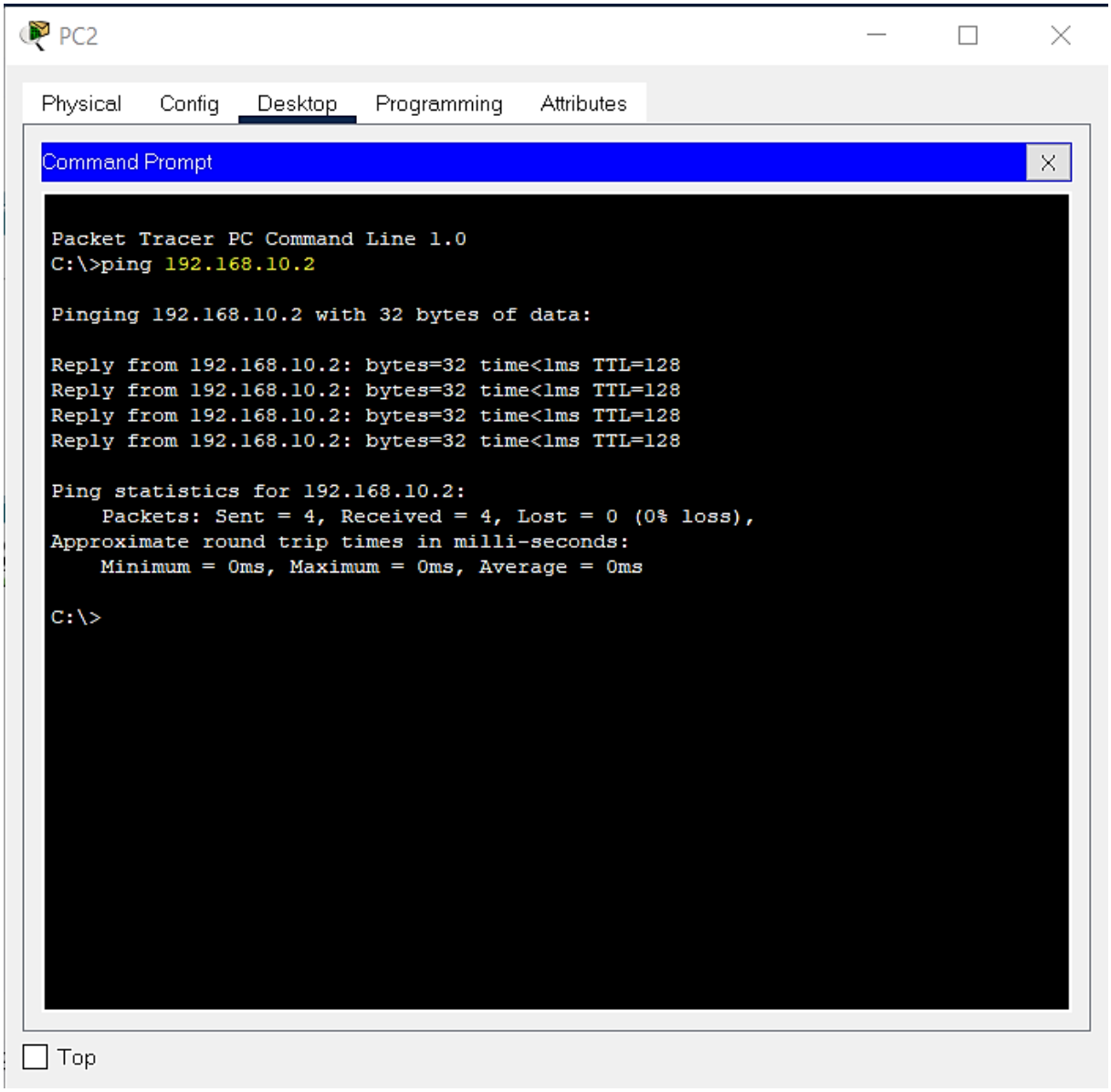


6) Display the ARP tables for the routers.



7) Test connectivity within the same VIT, Indian Bank PCs.

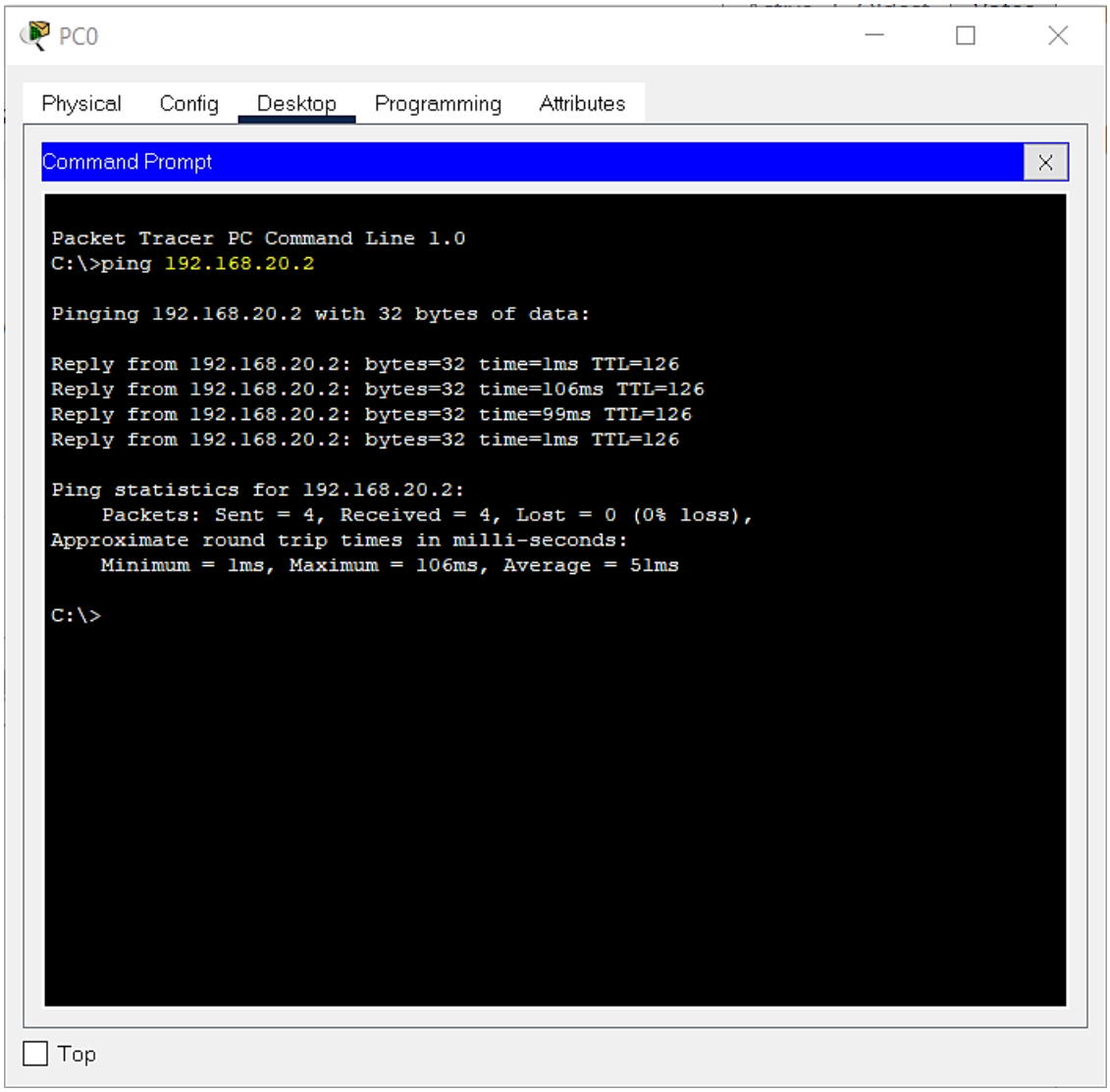
Testing connection between PC2 (192.168.10.4) and PC0 (192.168.10.2) using ping command:



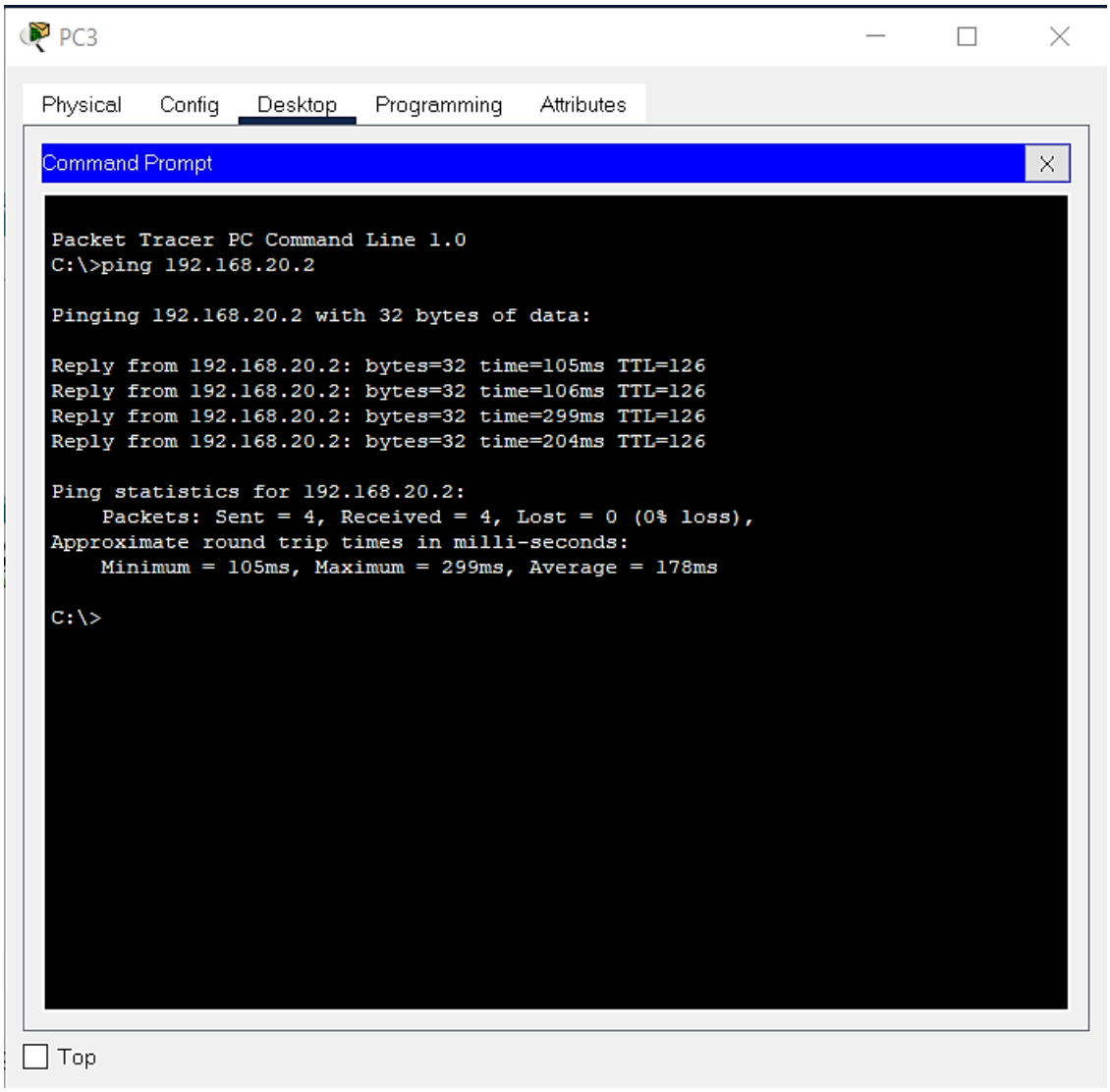
8) Test the connectivity between the server and the PCs.

i. Using ping command

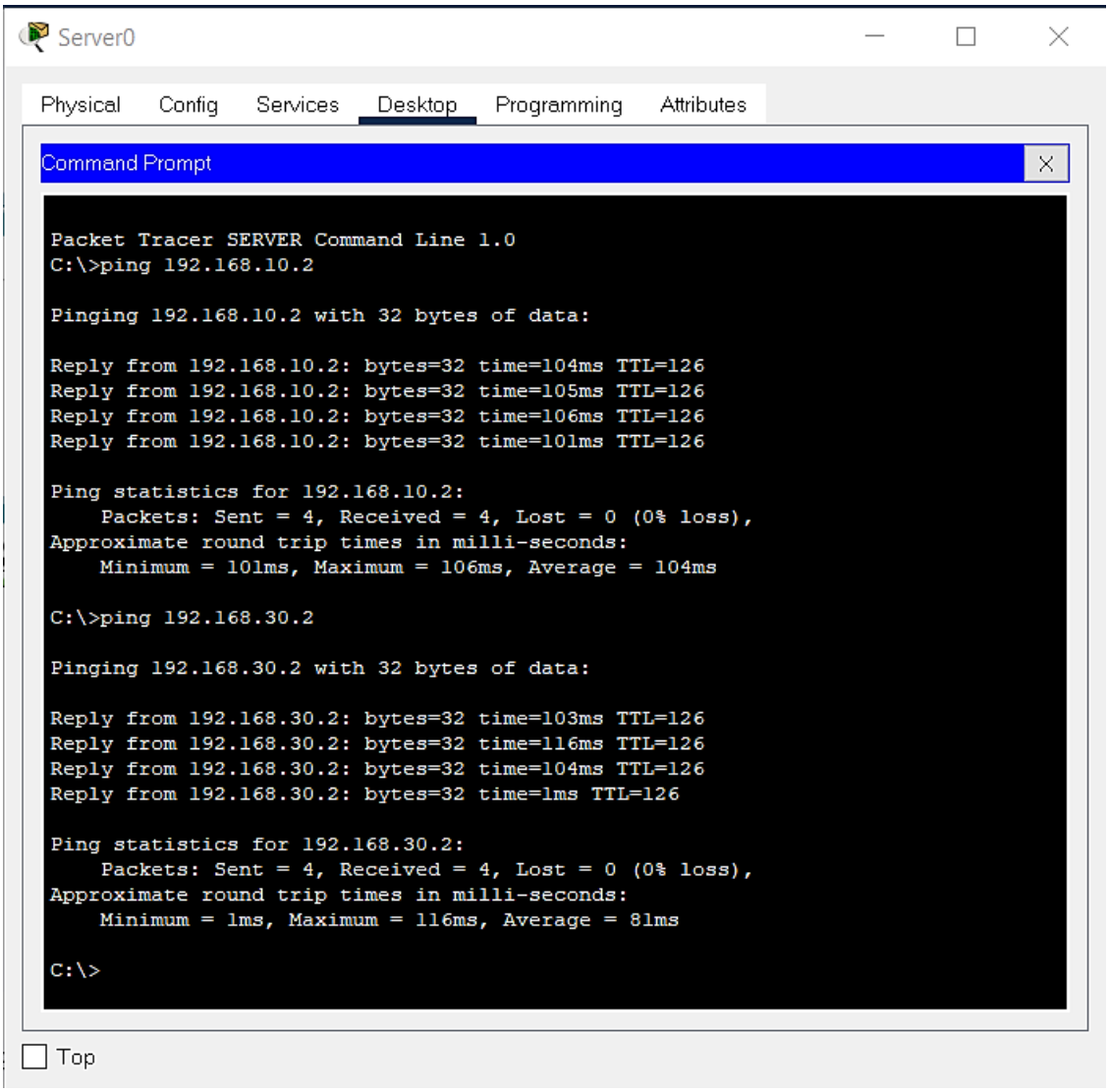
Testing connection between PC0 (192.168.10.2) and Server0 (192.168.20.2) using ping command:



Testing connection between PC3 (192.168.30.2) and Server0 (192.168.20.2) using ping command:

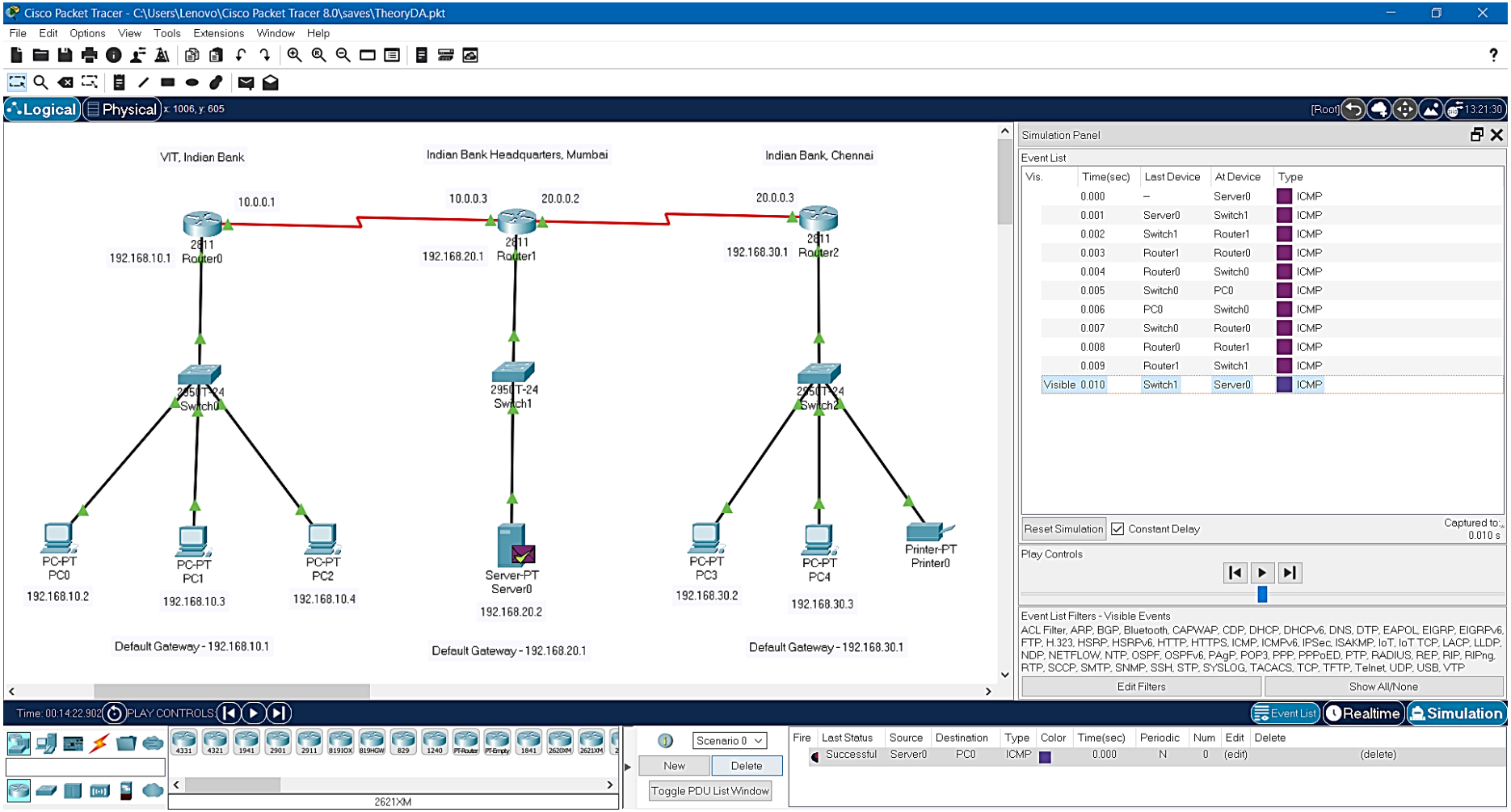


Testing connection between Server0 (192.168.20.2) with PC0 and PC3 using ping command:

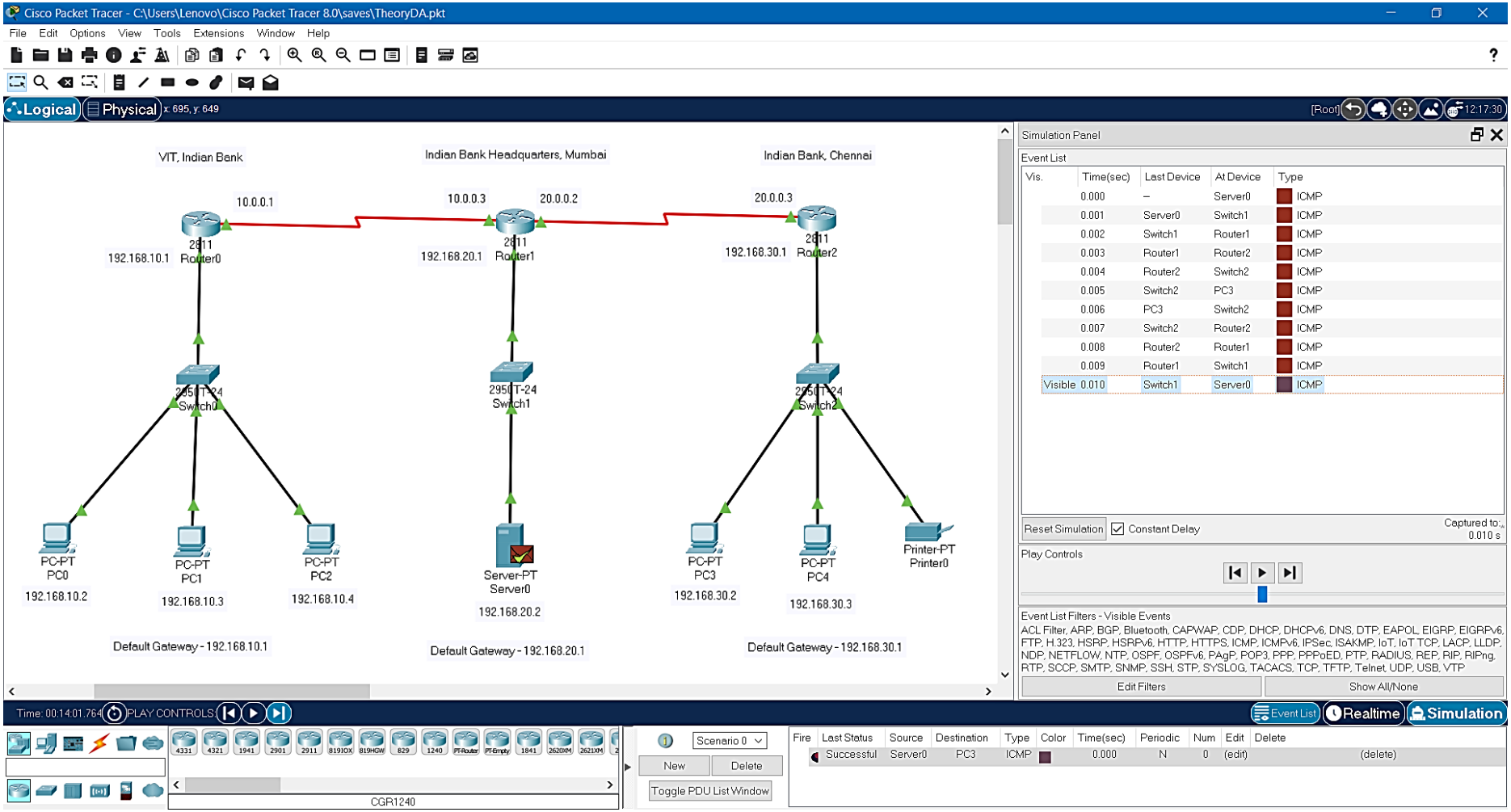


ii. Using PDU

Testing connection between Server0 (192.168.20.2) with PC0 (192.168.10.2) using PDU:



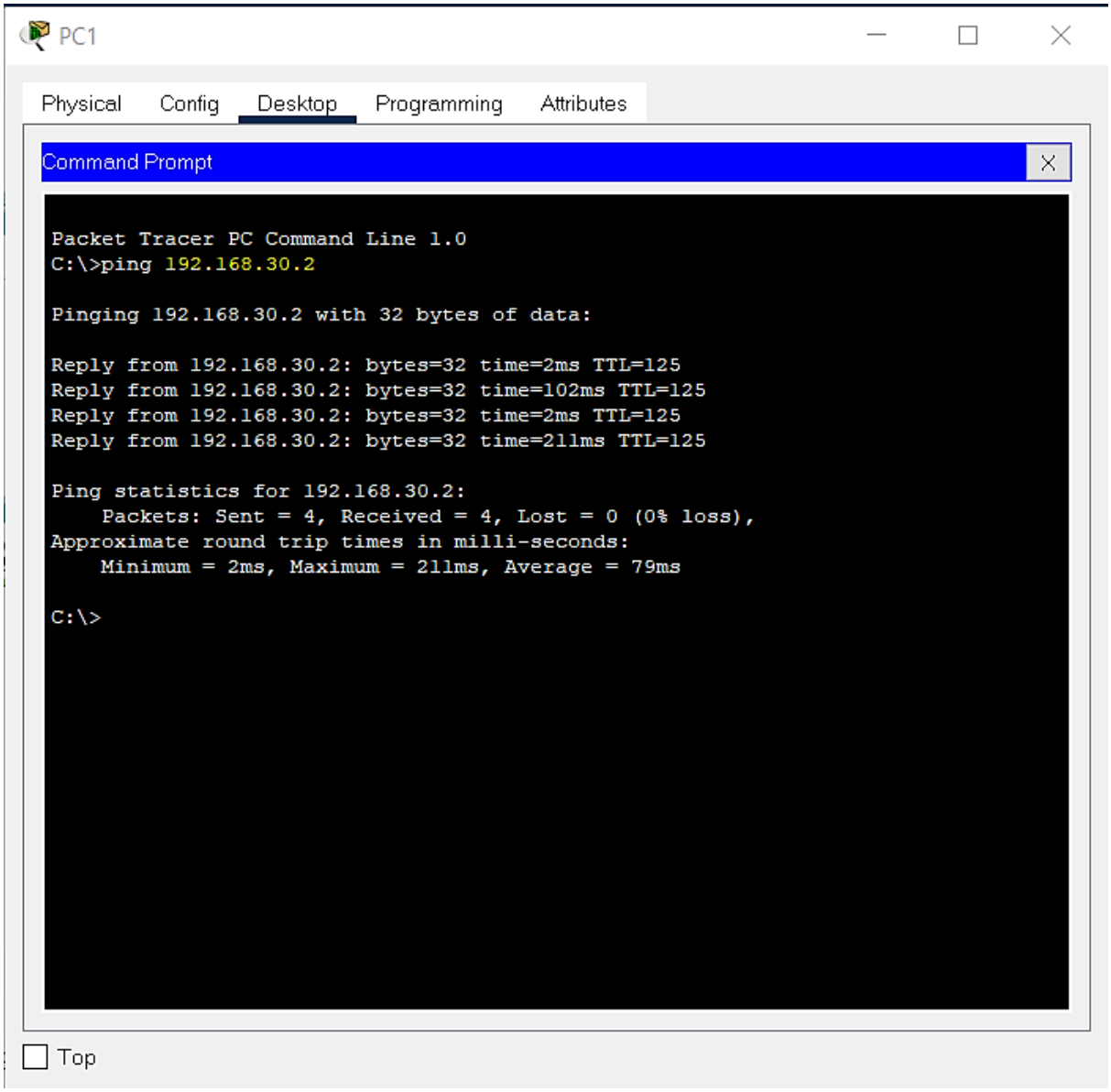
Testing connection between Server0 (192.168.20.2) with PC3 (192.168.30.2) using PDU:



9) Test the connectivity between one PC in one network to another PC in the other network.

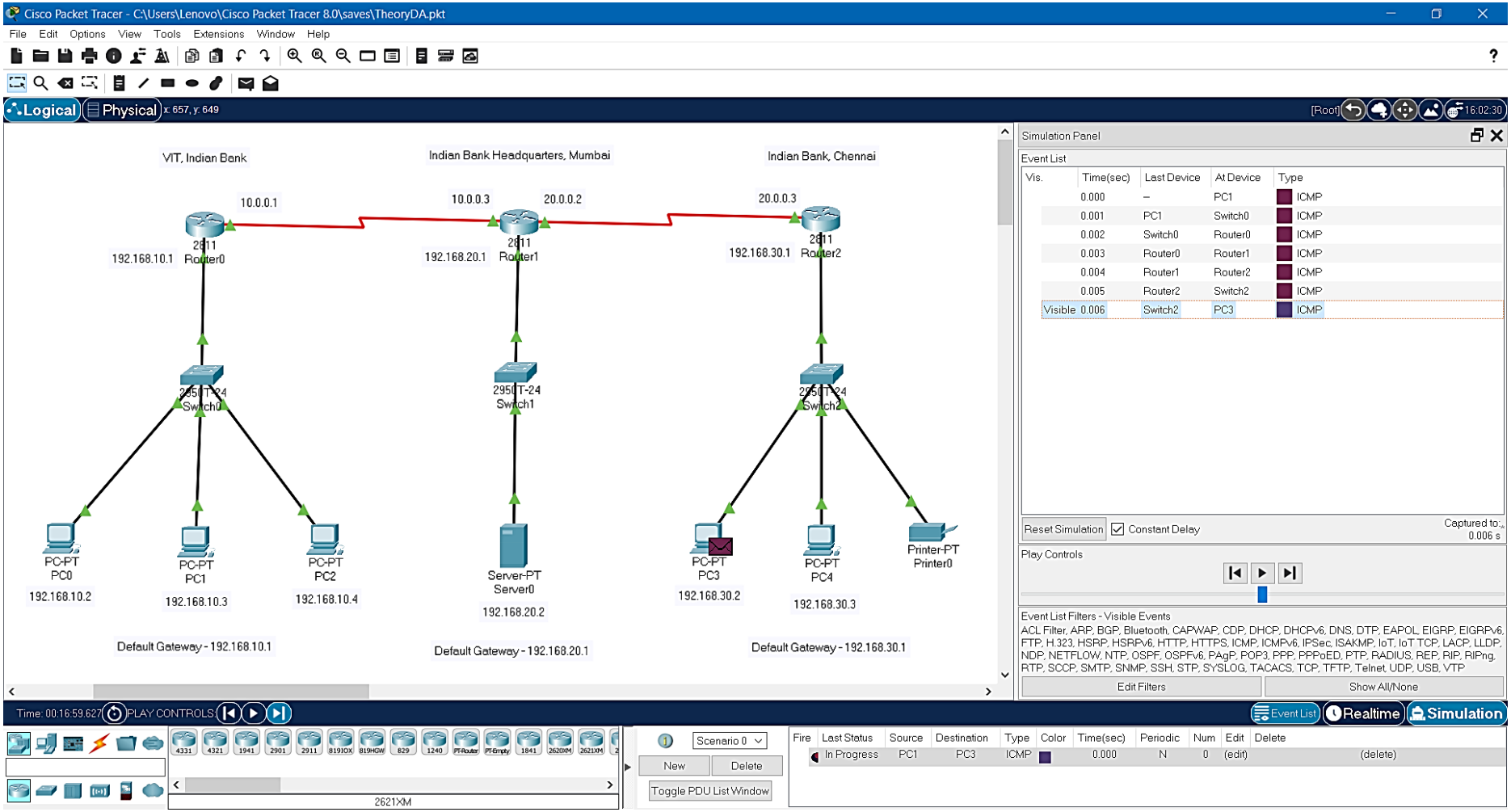
Using ping command:

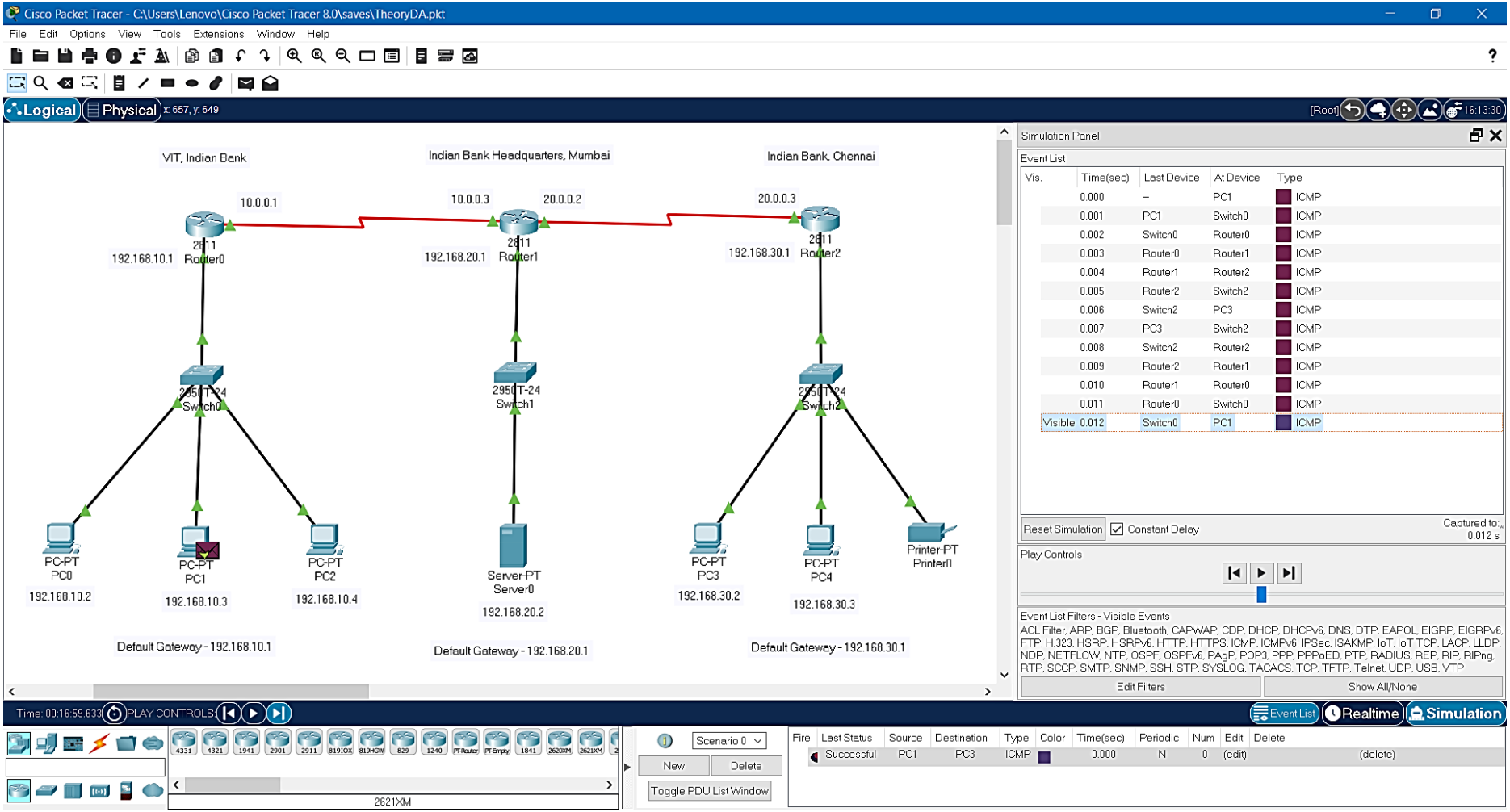
Testing connection between PC1 (192.168.10.3) and PC3 (192.168.30.2) using ping command:



10) Screenshot of PDU sent from one PC in one network to another PC in other network.

Testing connection between PC1 (192.168.10.3) and PC3 (192.168.30.2) using PDU:




Cisco Packet Tracer - C:\Users\Lenovo\Cisco Packet Tracer 8.0\saves\TheoryDA.pkt
File Edit Options View Tools Extensions Window Help
Logical Physical x: 657, y: 649
[Root] 16:13:30
VIT, Indian Bank
Indian Bank Headquarters, Mumbai
Indian Bank, Chennai
10.0.0.1
10.0.0.3
20.0.0.2
20.0.0.3
2811 Router0
2811 Router1
2811 Router2
192.168.10.1
192.168.20.1
192.168.30.1
2950T-24 Switch0
2950T-24 Switch1
2950T-24 Switch2
PC-PT PC0
PC-PT PC1
PC-PT PC2
Server-PT Server0
PC-PT PC3
PC-PT PC4
Printer-PT Printer0
192.168.10.2
192.168.10.3
192.168.10.4
192.168.20.2
192.168.30.2
192.168.30.3
Default Gateway - 192.168.10.1
Default Gateway - 192.168.20.1
Default Gateway - 192.168.30.1
Simulation Panel
Event List
Vis. Time(sec) Last Device At Device Type
0.000 – PC1 ICMP
0.001 PC1 Switch0 ICMP
0.002 Switch0 Router0 ICMP
0.003 Router0 Router1 ICMP
0.004 Router1 Router2 ICMP
0.005 Router2 Switch2 ICMP
0.006 Switch2 PC3 ICMP
0.007 PC3 Switch2 ICMP
0.008 Switch2 Router2 ICMP
0.009 Router2 Router1 ICMP
0.010 Router1 Router0 ICMP
0.011 Router0 Switch0 ICMP
Visible 0.012 Switch0 PC1 ICMP
Reset Simulation
Constant Delay
Captured to: 0.012 s
Play Controls
Event List Filters - Visible Events
ACL Filter, ARP, BGP, Bluetooth, CAPWAP, CDP, DHCP, DHCPv6, DNS, DTP, EAPOL, EIGRP, EIGRPv6, FTP, H.323, HSRP, HSRPv6, HTTP, HTTPS, ICMP, ICMPv6, IPSec, ISAKMP, IoT, IoT TCP, LACP, LLDP, NDP, NETFLOW, NTP, OSPF, OSPFv6, PAgP, POP3, PPP, PPPoED, PTP, RADIUS, REP, RIP, RIPng, RTP, SCCP, SMTP, SNMP, SSH, STP, SYSLOG, TACACS, TCP, TFTP, Telnet, UDP, USB, VTP
Edit Filters
Show All/None
Time: 00:16:59.633 PLAY CONTROLS:
Event List Realtime Simulation
2621XM
Scenario 0
New Delete
Toggle PDU List Window
Fire Last Status Source Destination Type Color Time(sec) Periodic Num Edit Delete
Successful PC1 PC3 ICMP 0.000 N 0 (edit) (delete)

QUESTION 2:

Implementing Distance Vector Routing:

Distance vector routing protocol is used to find the distance between different networks using different routers.

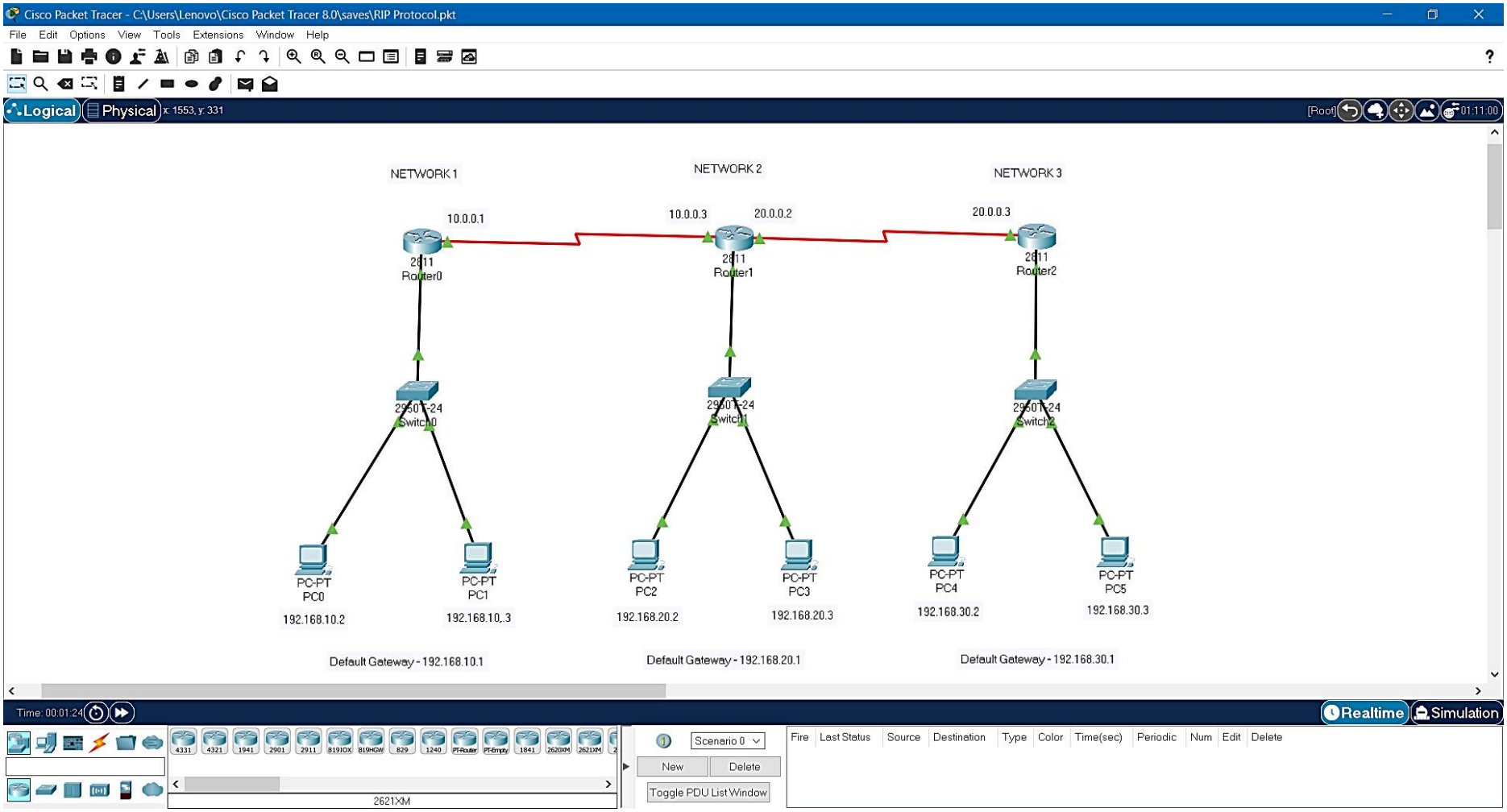
Very commonly used to find this is the RIP protocol (i.e., the Routing Information Protocol). This method is very common and popular for finding the distance vector.

So, I will be using this to determine the best route the reach the destination.

Hence, I will be using the RIP protocol for finding the distance between the different networks.

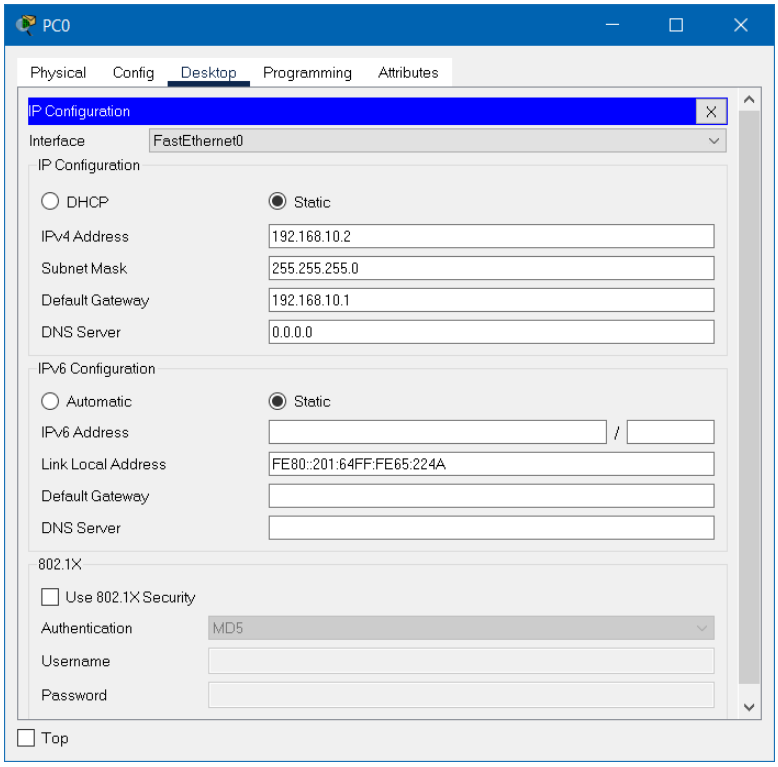
I will be designing it using three networks (i.e., three routers) each network having 2 PCs we will be finding the distance using RIP protocol.

1) Screen shot of the designed network

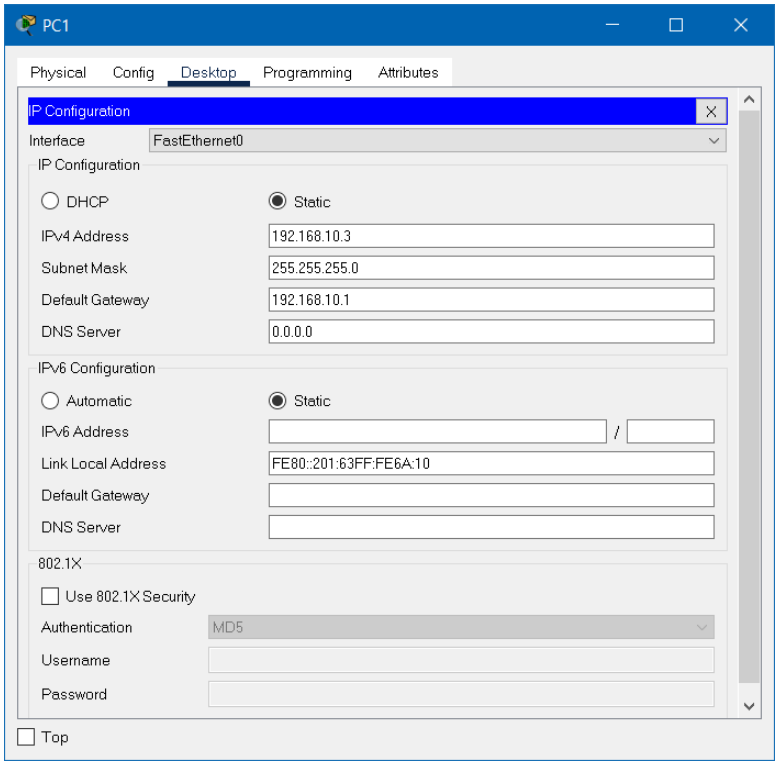


2) IP address configuration with default gateway for all PCs.

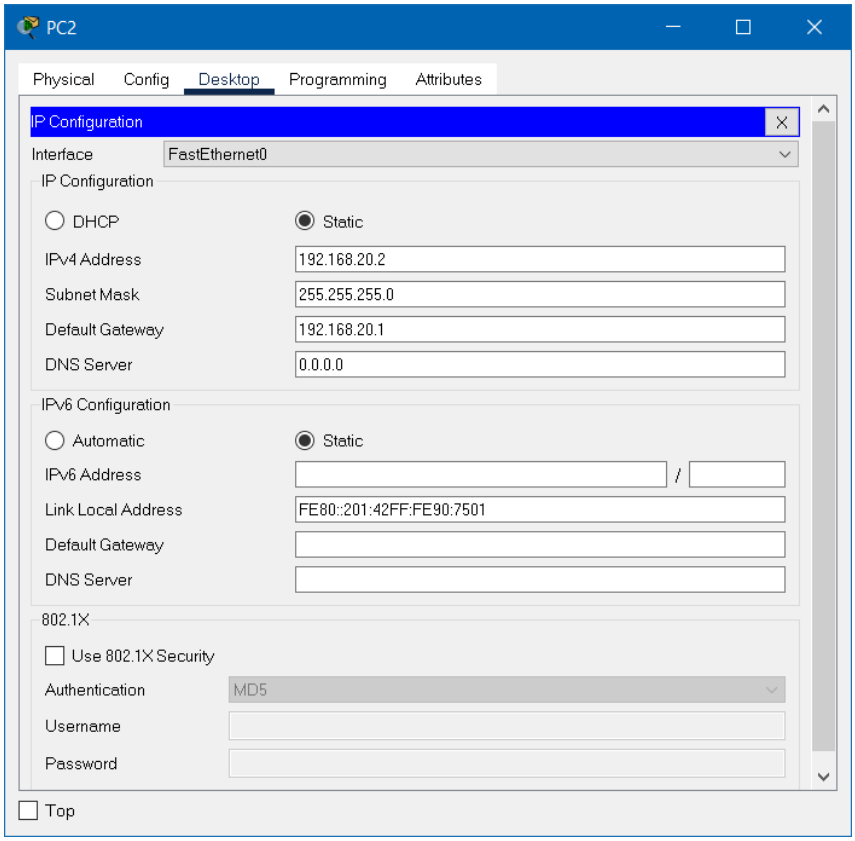
PC0:



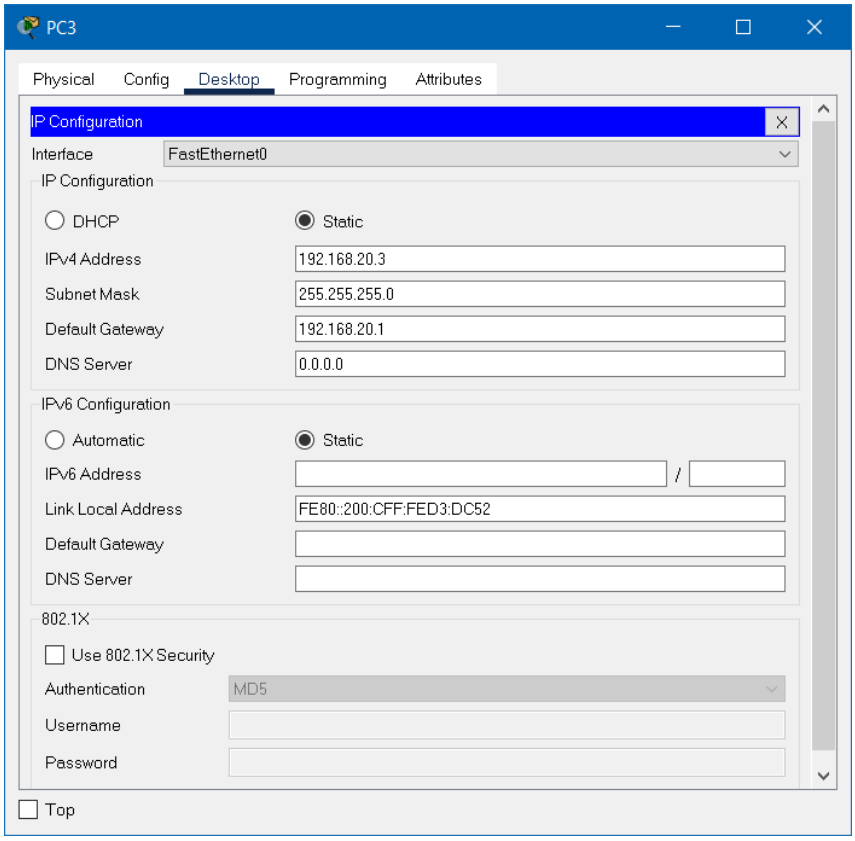
PC1:



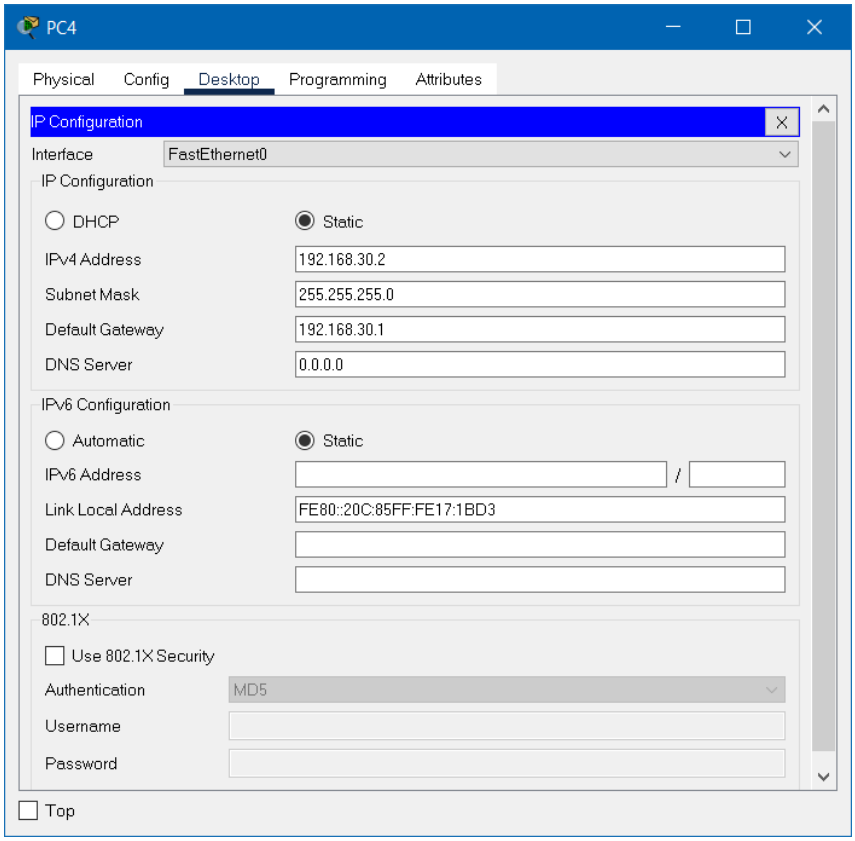
PC2:


PC2
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.20.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.20.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::201:42FF:FE90:7501
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

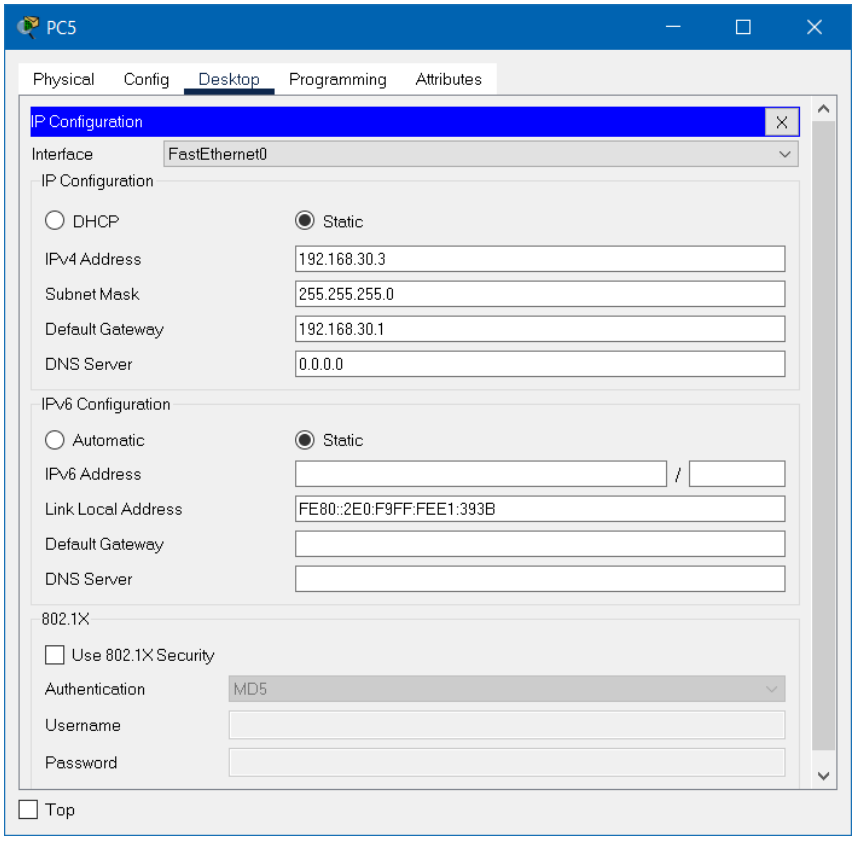
PC3:


PC3
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.20.3
Subnet Mask
255.255.255.0
Default Gateway
192.168.20.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::200:CFF:FED3:DC52
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

PC4:

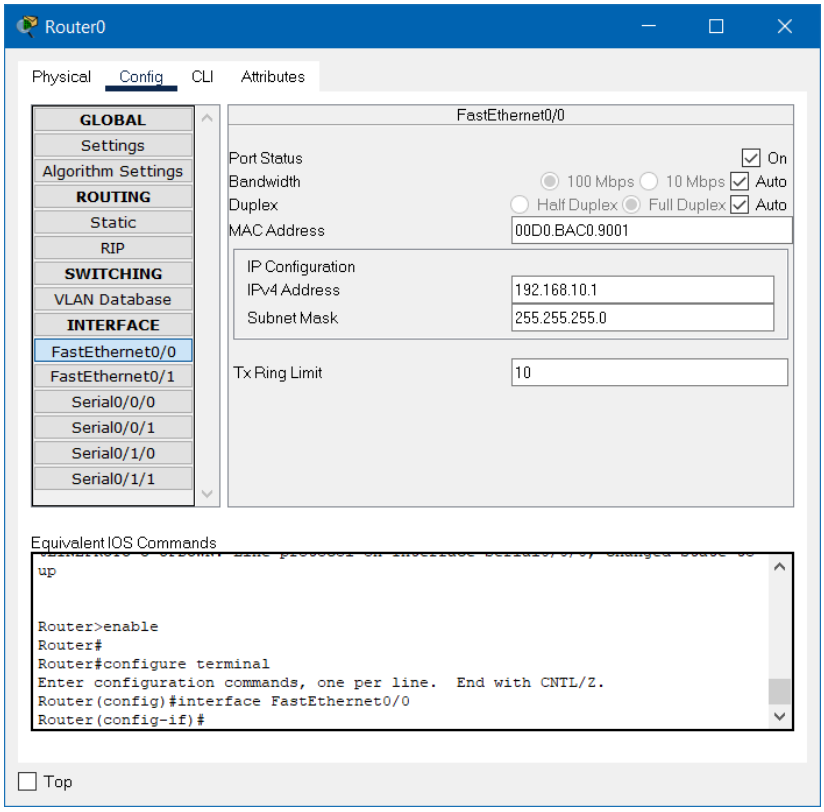

PC4
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.30.2
Subnet Mask
255.255.255.0
Default Gateway
192.168.30.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::20C:85FF:FE17:1BD3
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

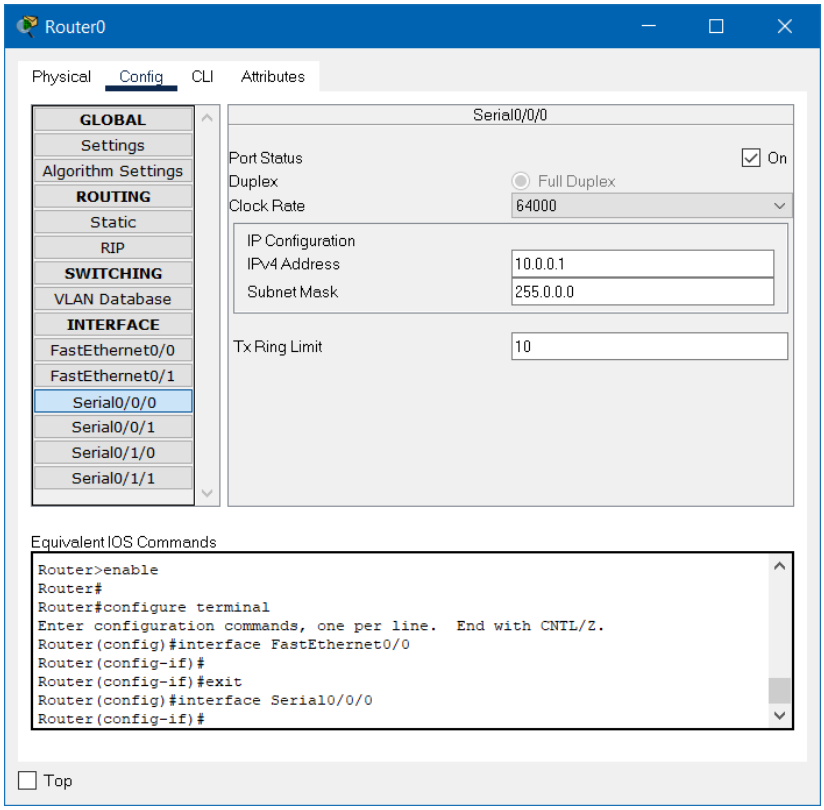
PC5:


PC5
Physical
Config
Desktop
Programming
Attributes
IP Configuration
Interface
FastEthernet0
IP Configuration
DHCP
Static
IPv4 Address
192.168.30.3
Subnet Mask
255.255.255.0
Default Gateway
192.168.30.1
DNS Server
0.0.0.0
IPv6 Configuration
Automatic
Static
IPv6 Address
Link Local Address
FE80::2E0:F9FF:FEE1:393B
Default Gateway
DNS Server
802.1X
Use 802.1X Security
Authentication
MD5
Username
Password
Top

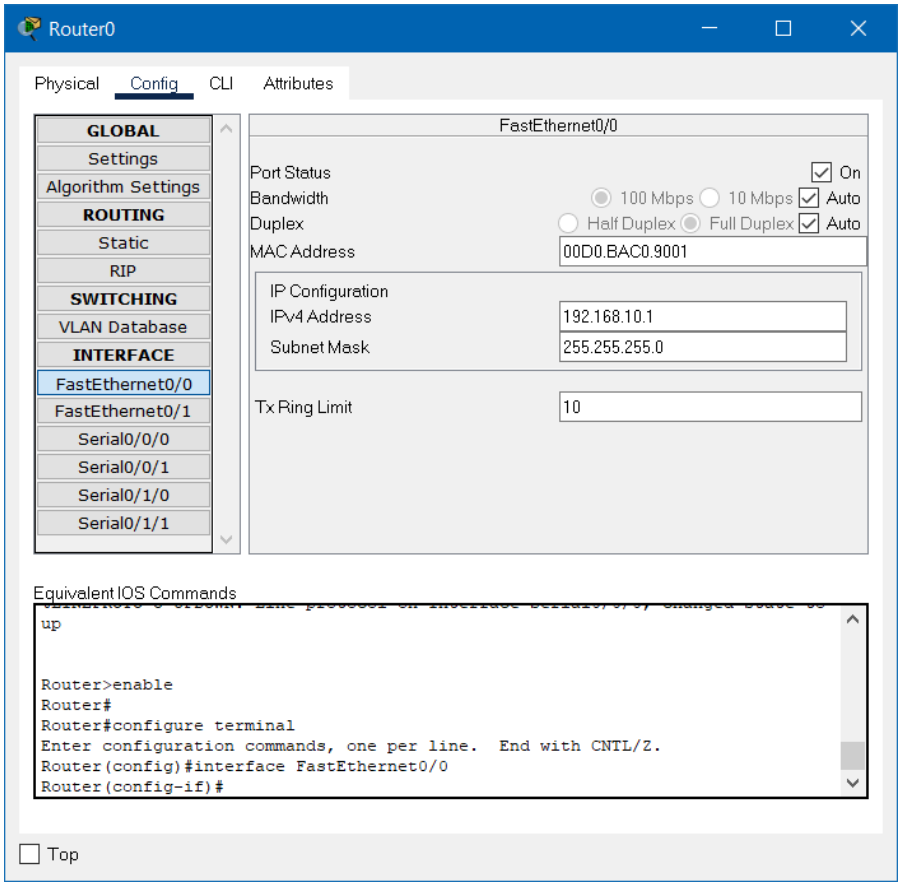
3) IP Configuration of Routers.

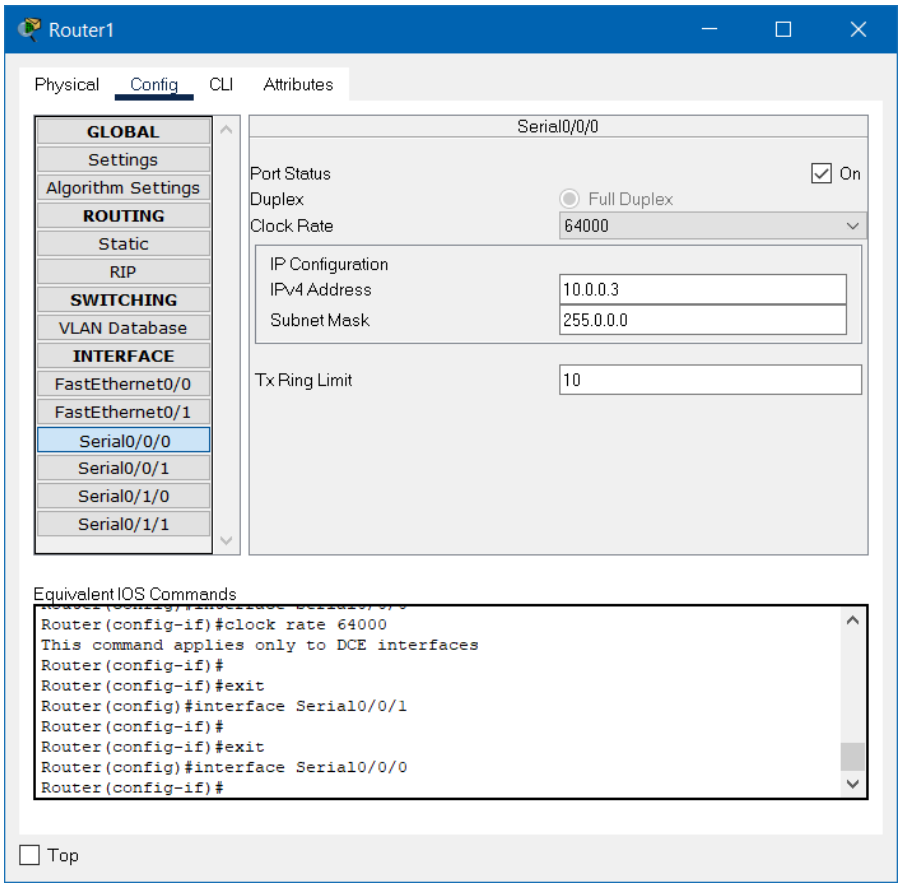
Router0:

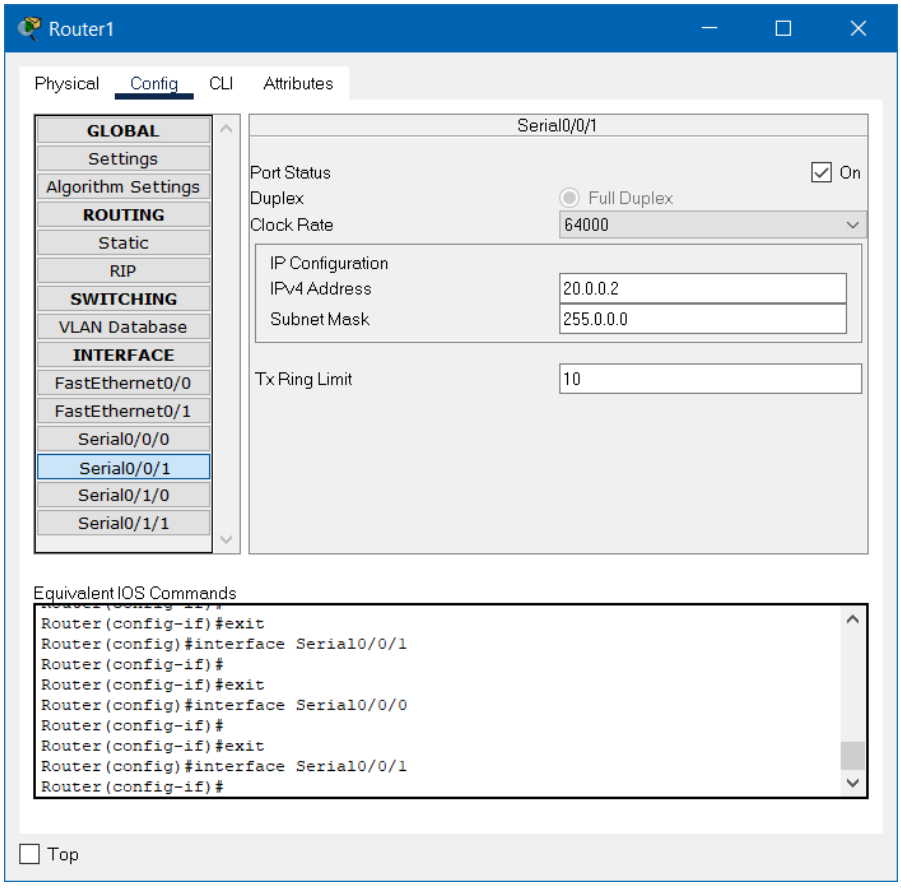




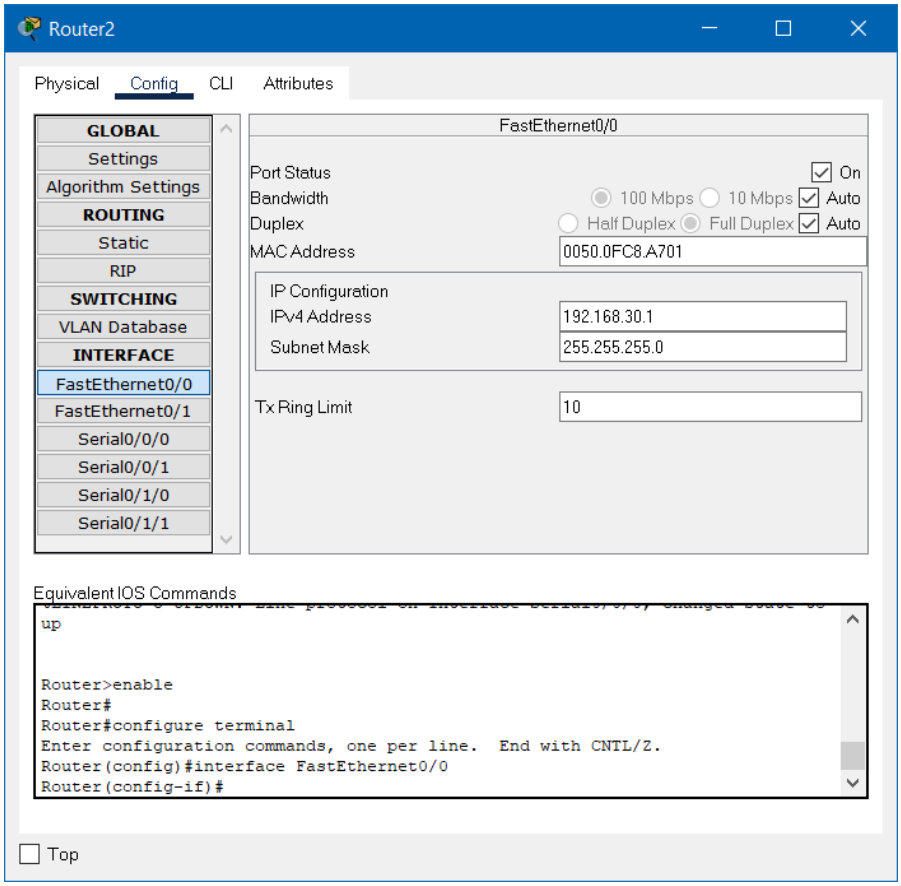
Router1:

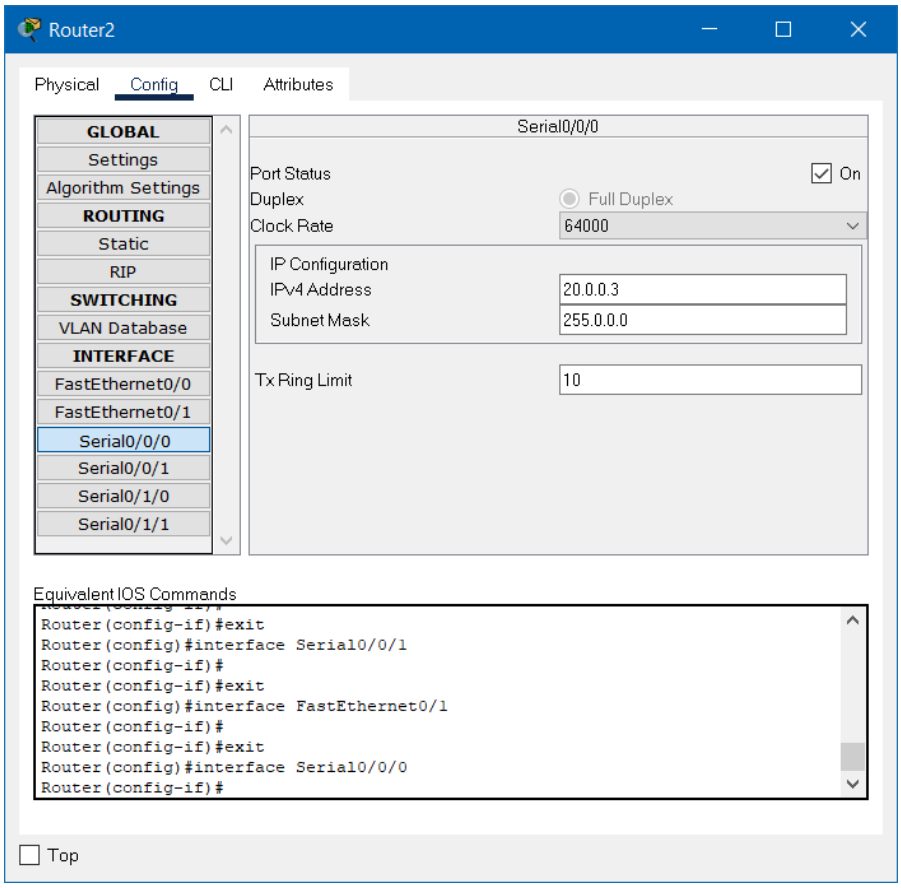

Router0
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
00D0.BAC0.9001
IP Configuration
IPv4 Address
192.168.10.1
Subnet Mask
255.255.255.0
Tx Ring Limit
10
Equivalent IOS Commands
up
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Top


Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
Serial0/0/0
Port Status
On
Duplex
Full Duplex
Clock Rate
64000
IP Configuration
IPv4 Address
10.0.0.3
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config-if)#clock rate 64000
This command applies only to DCE interfaces
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Top

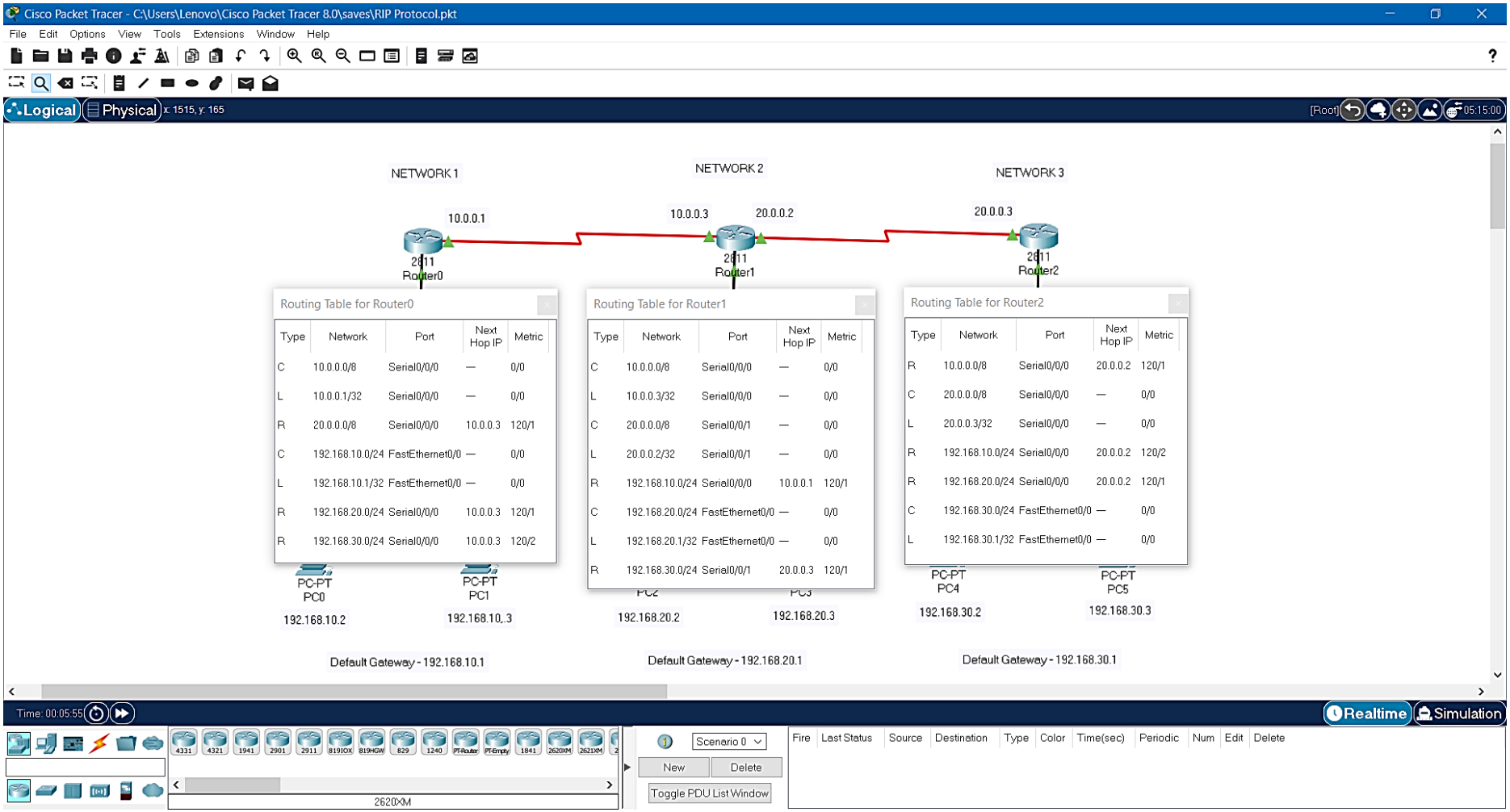

Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
Serial0/0/1
Port Status
On
Duplex
Full Duplex
Clock Rate
64000
IP Configuration
IPv4 Address
20.0.0.2
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#
Top

Router2:


Router2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
FastEthernet0/0
Port Status
On
Bandwidth
100 Mbps
10 Mbps
Auto
Duplex
Half Duplex
Full Duplex
Auto
MAC Address
0050.0FC8.A701
IP Configuration
IPv4 Address
192.168.30.1
Subnet Mask
255.255.255.0
Tx Ring Limit
10
Equivalent IOS Commands
up
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#
Top


Router2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
Serial0/0/0
Port Status
On
Duplex
Full Duplex
Clock Rate
64000
IP Configuration
IPv4 Address
20.0.0.3
Subnet Mask
255.0.0.0
Tx Ring Limit
10
Equivalent IOS Commands
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Top

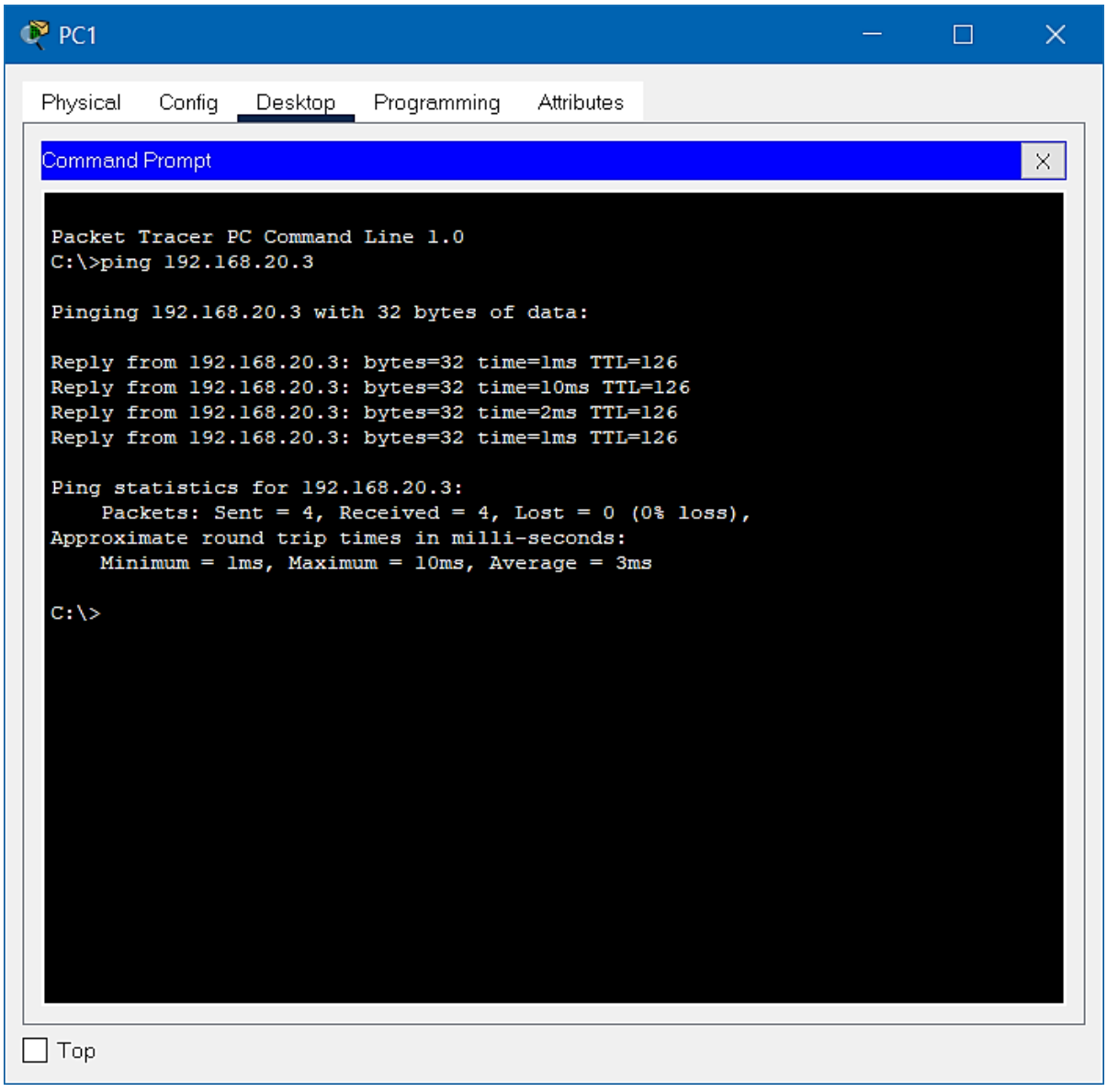
4) Display the routing tables for the routers.



5) Test the connectivity between NETWORK 1 and NETWORK 2.

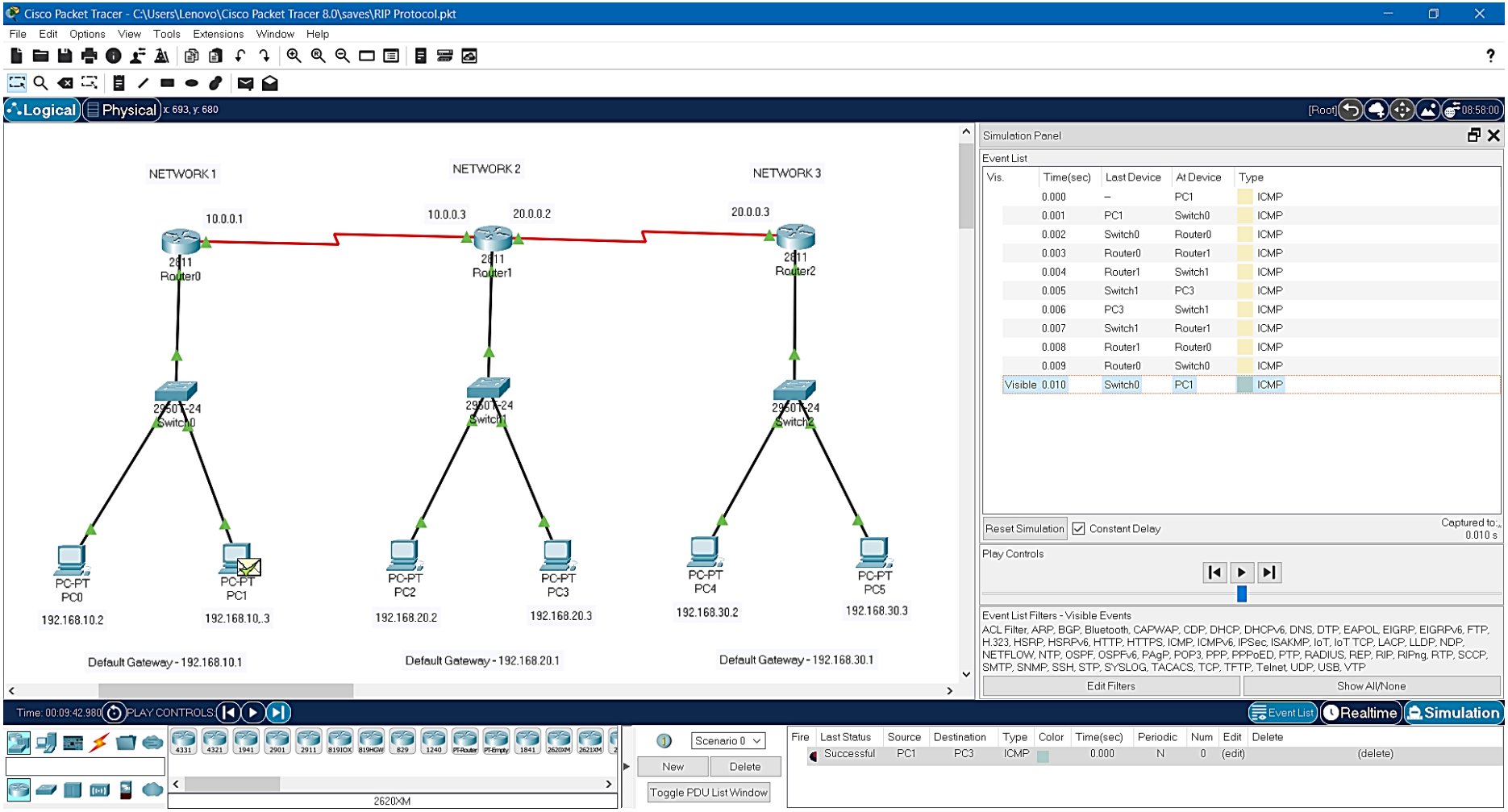
i) Using ping command

Testing connection between PC1 (192.168.10.3) and PC3 (192.168.20.3) using ping command:



ii) Using PDU

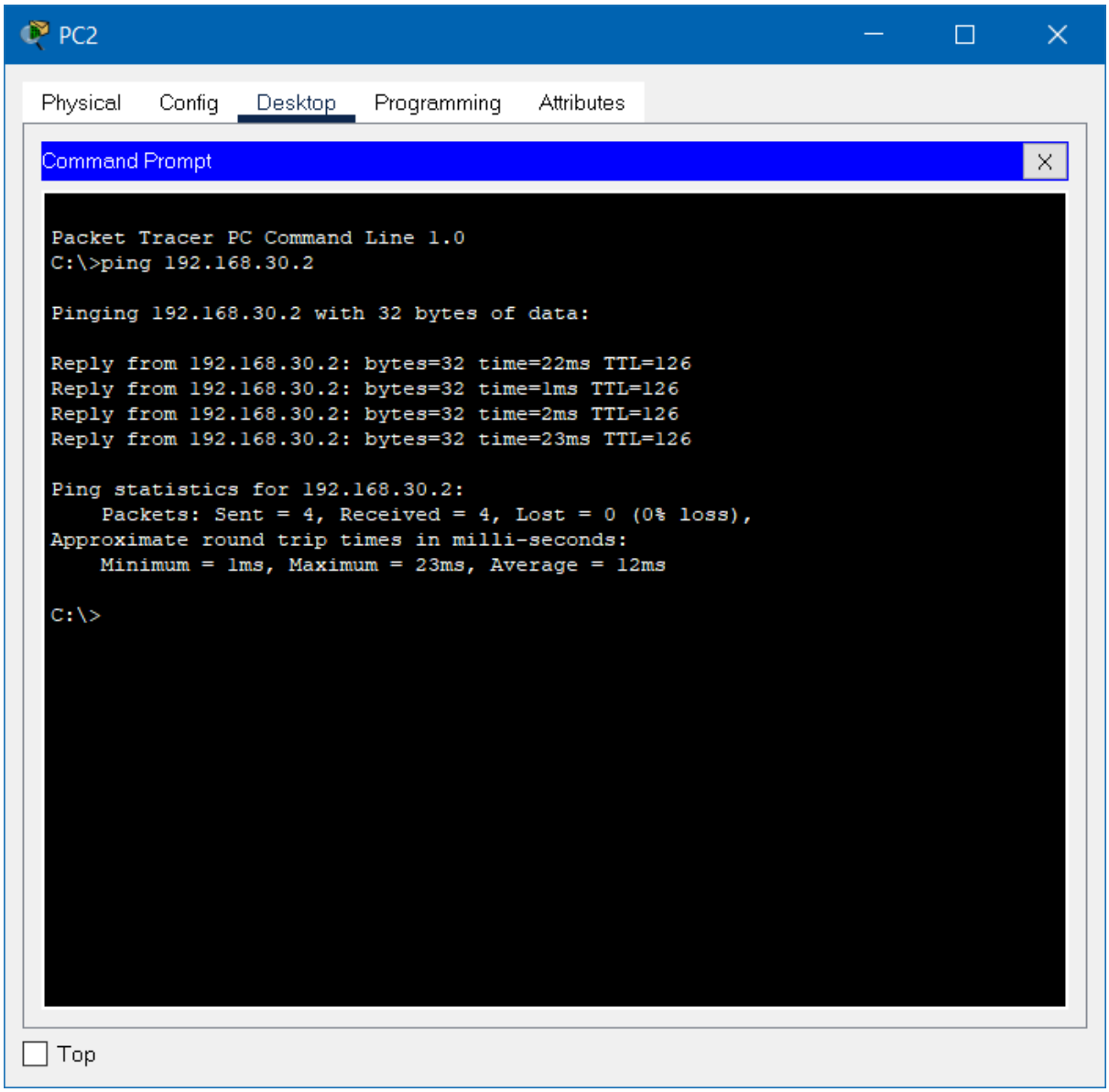
Testing connection between PC1 (192.168.10.3) and PC3 (192.168.20.3) using PDU:



6) Test the connectivity between NETWORK 2 and NETWORK 3.

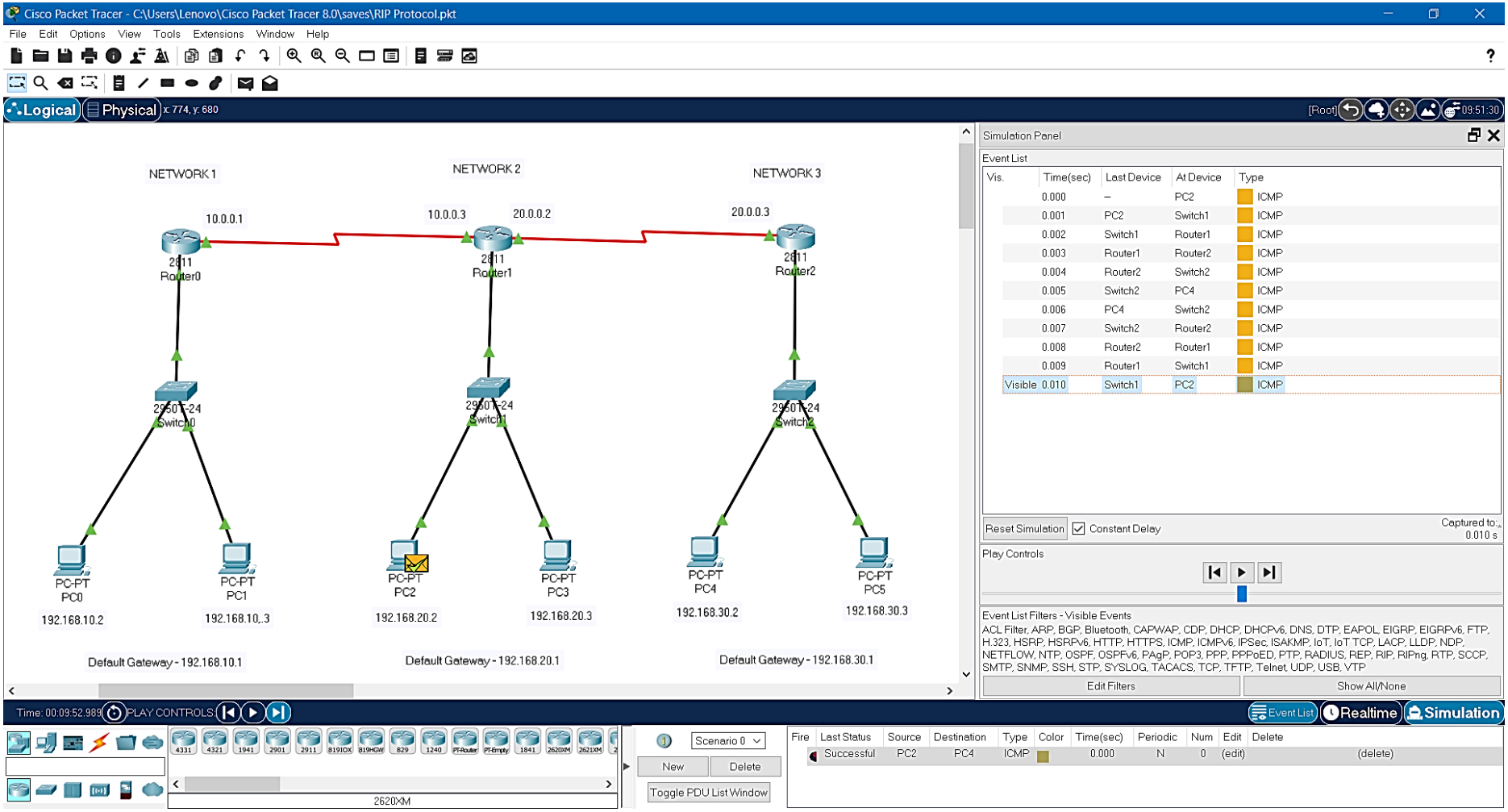
i) Using ping command

Testing connection between PC2 (192.168.20.2) and PC4 (192.168.30.2) using ping command:



ii) Using PDU

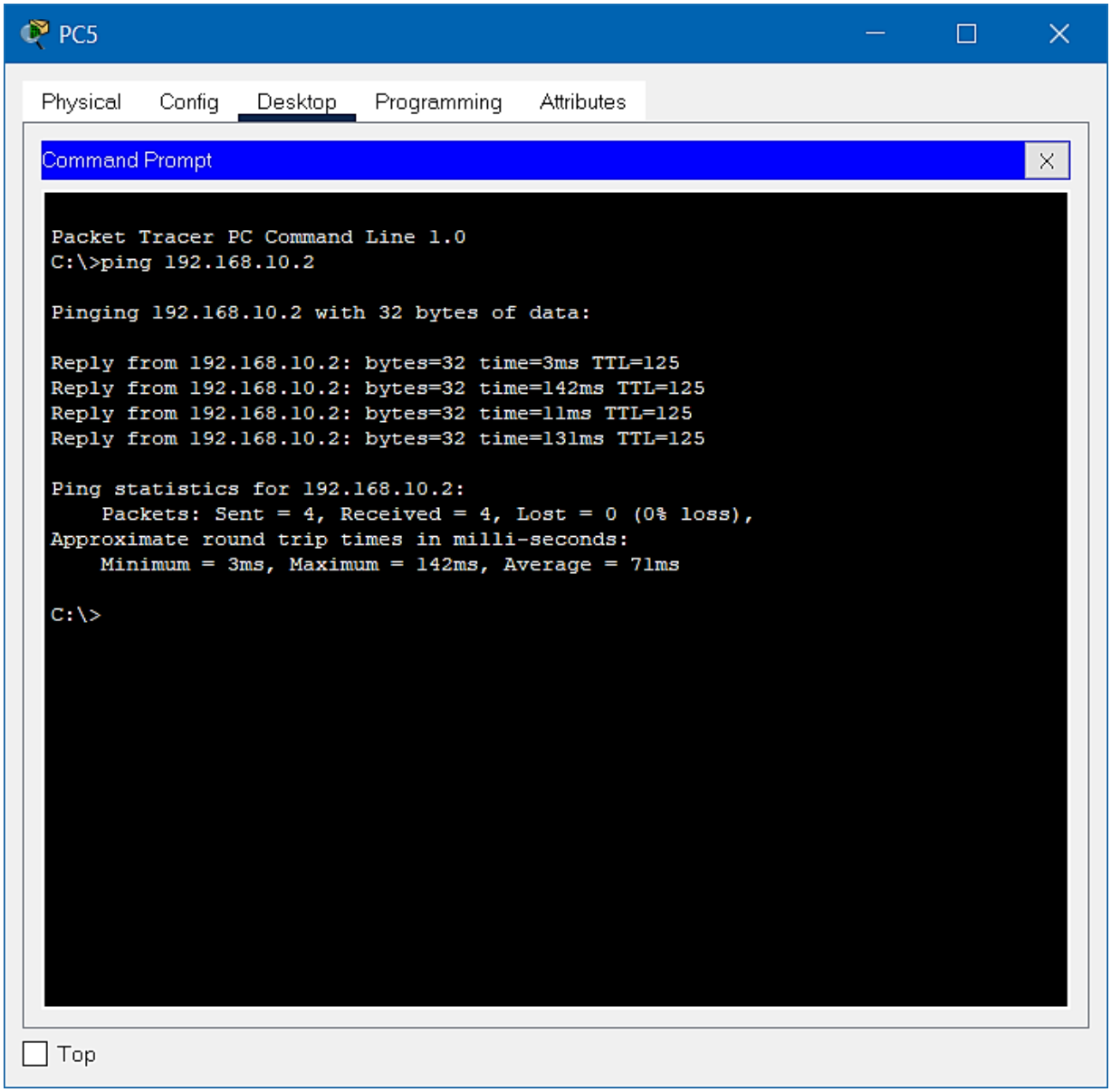
Testing connection between PC2 (192.168.20.2) and PC4 (192.168.30.2) using PDU:



7) Test the connectivity between NETWORK 3 and NETWORK 1.

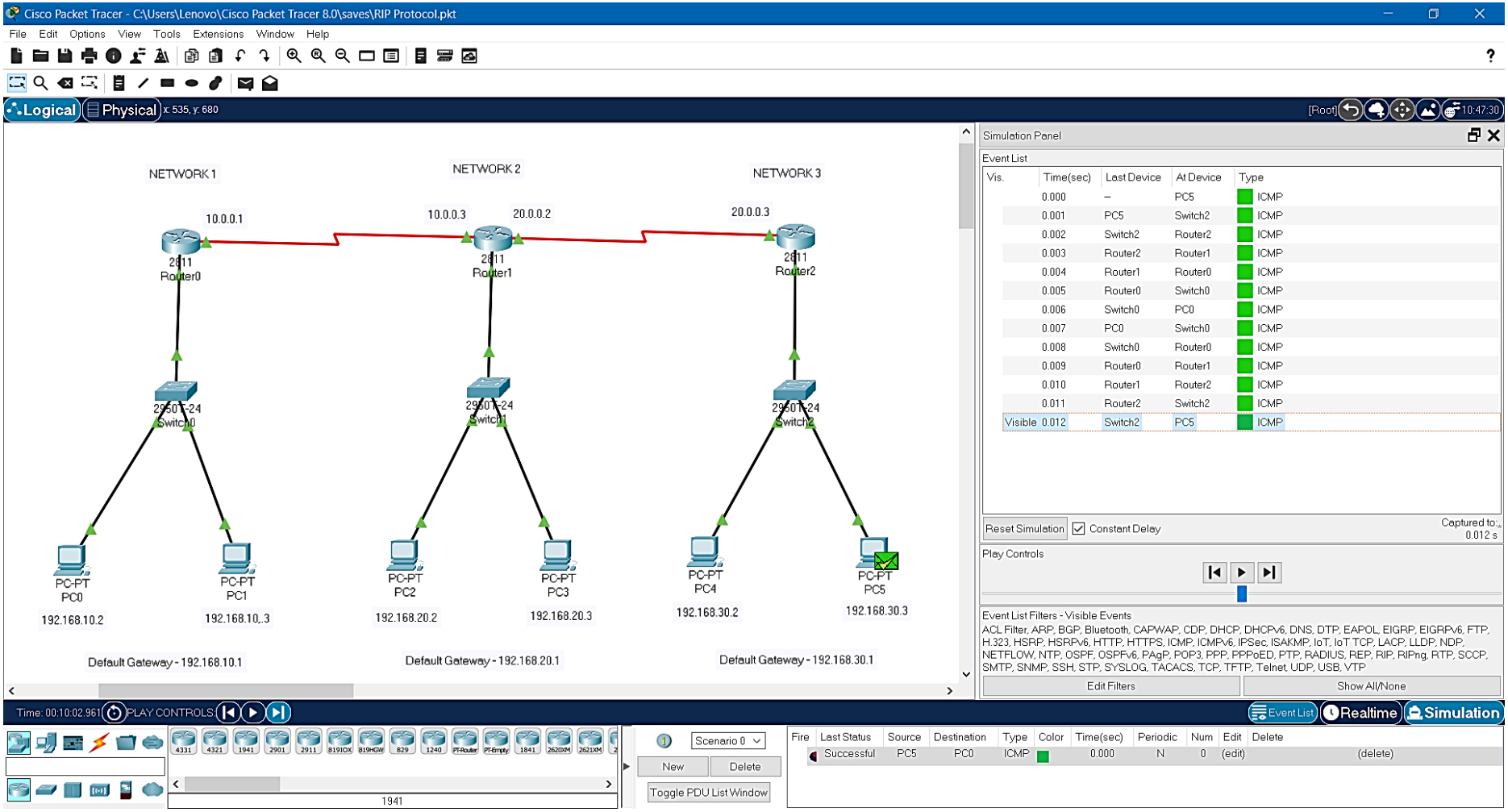
i) Using ping command

Testing connection between PC5 (192.168.30.3) and PC0 (192.168.10.2) using ping command:



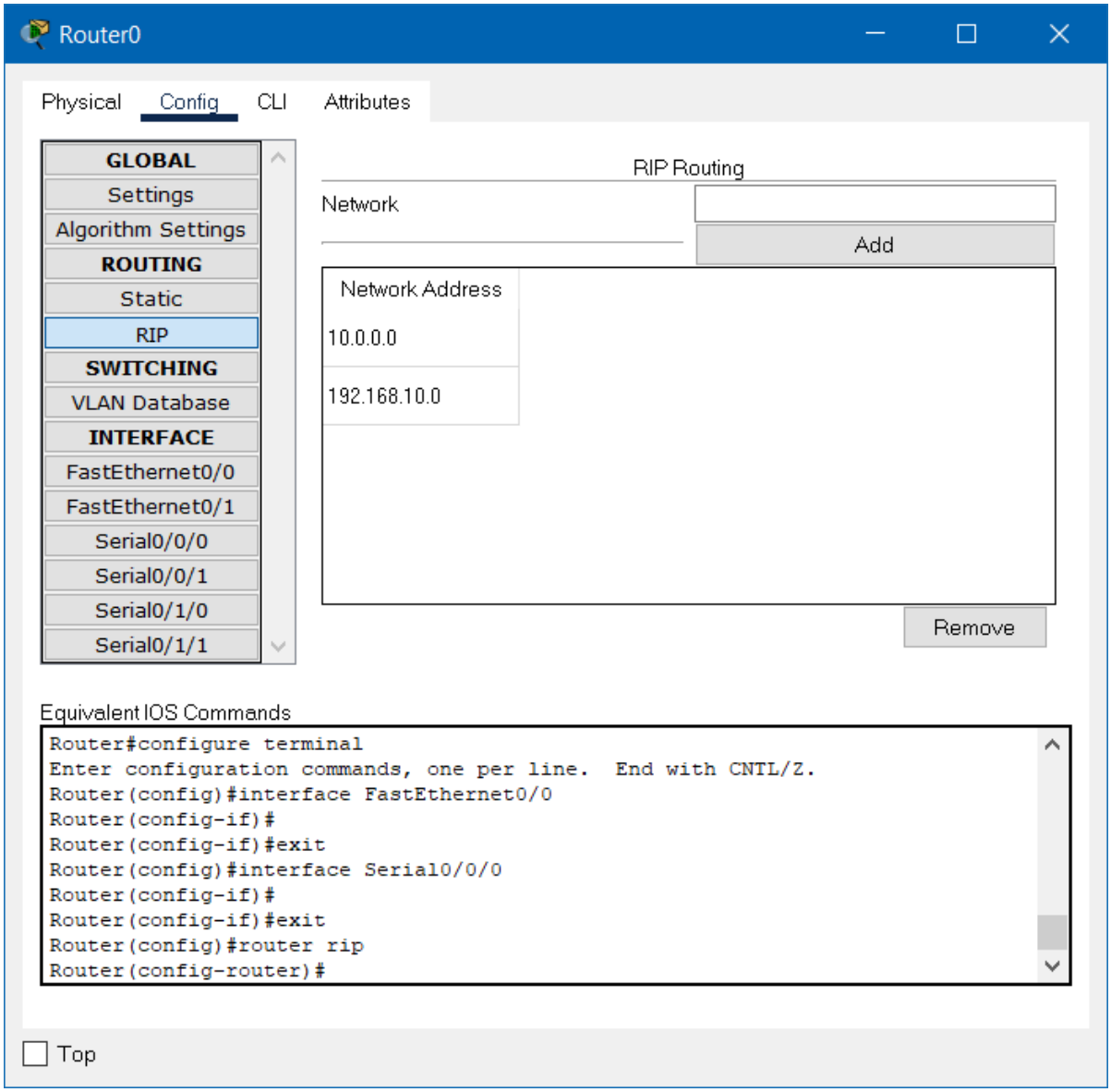
ii) Using PDU

Testing connection between PC5 (192.168.30.3) and PC0 (192.168.10.2) using PDU:

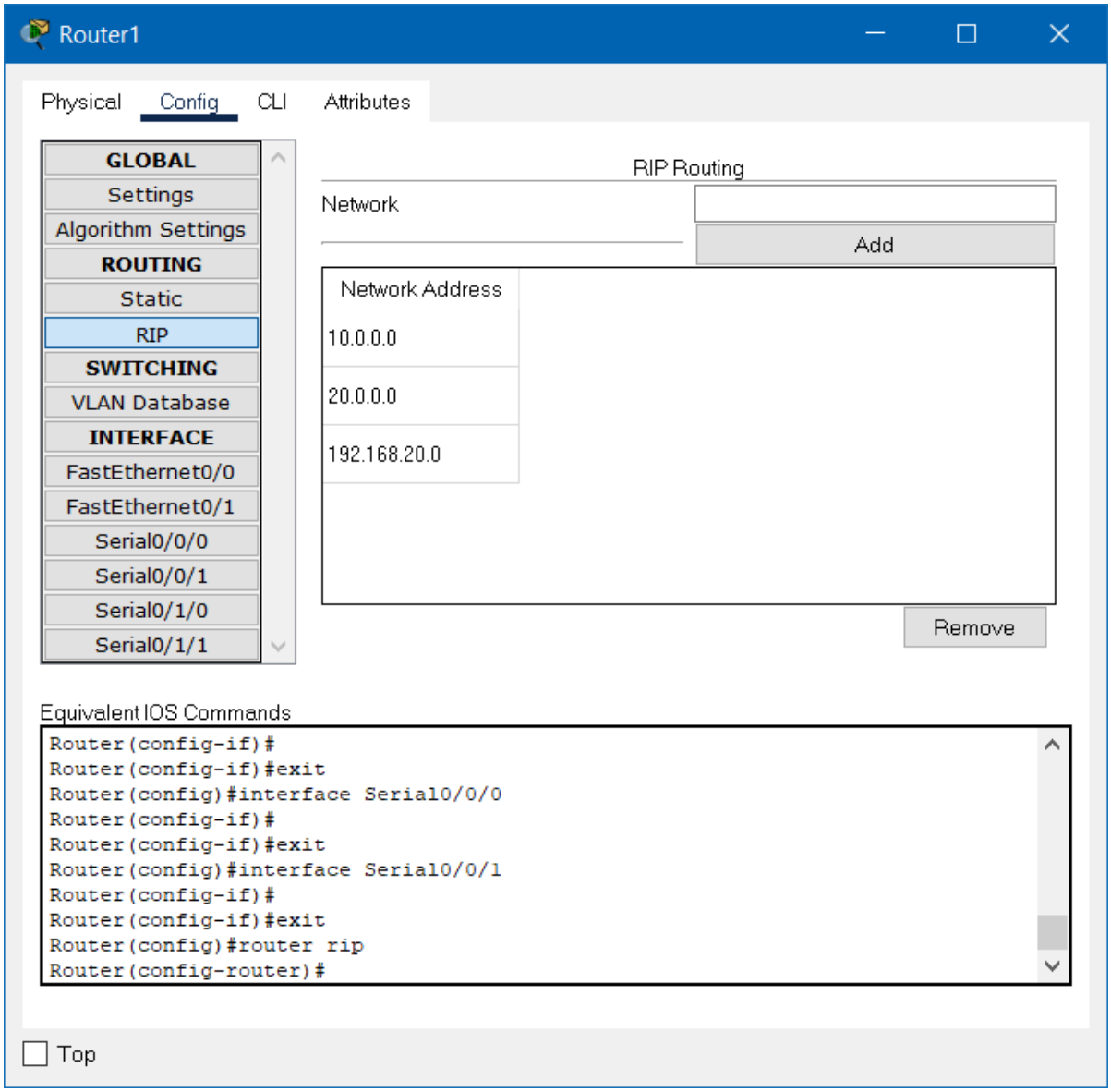


8) Configuration of RIP Routing for the Routers.

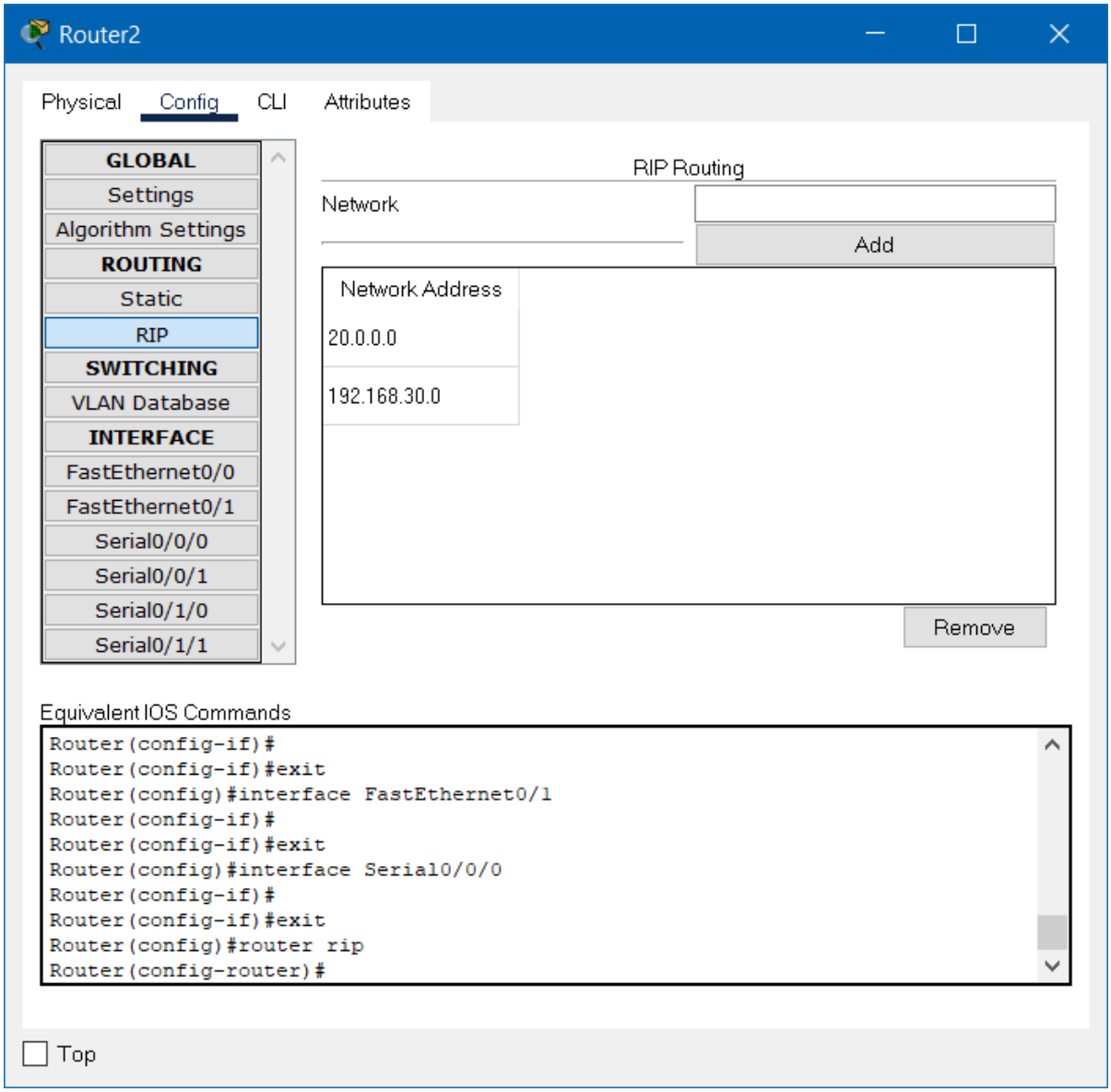
Router0:



Router1:


Router1
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
RIP Routing
Network
Add
Network Address
10.0.0.0
20.0.0.0
192.168.20.0
Remove
Equivalent IOS Commands
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#
Top

Router2:

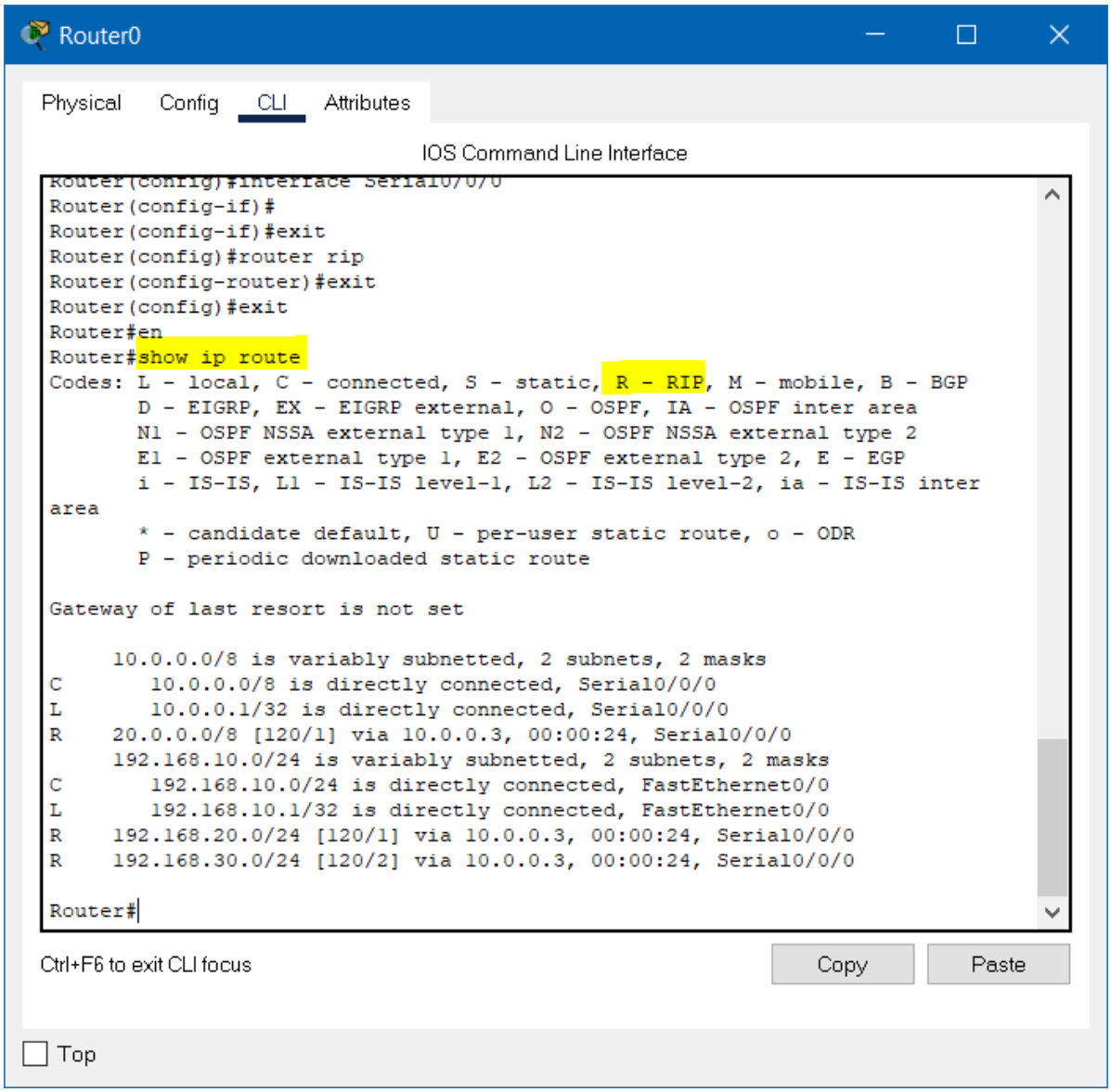

Router2
Physical
Config
CLI
Attributes
GLOBAL
Settings
Algorithm Settings
ROUTING
Static
RIP
SWITCHING
VLAN Database
INTERFACE
FastEthernet0/0
FastEthernet0/1
Serial0/0/0
Serial0/0/1
Serial0/1/0
Serial0/1/1
RIP Routing
Network
Add
Network Address
20.0.0.0
192.168.30.0
Remove
Equivalent IOS Commands
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/1
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#
Top

9) IMPLEMENTATION OF THE RIP.

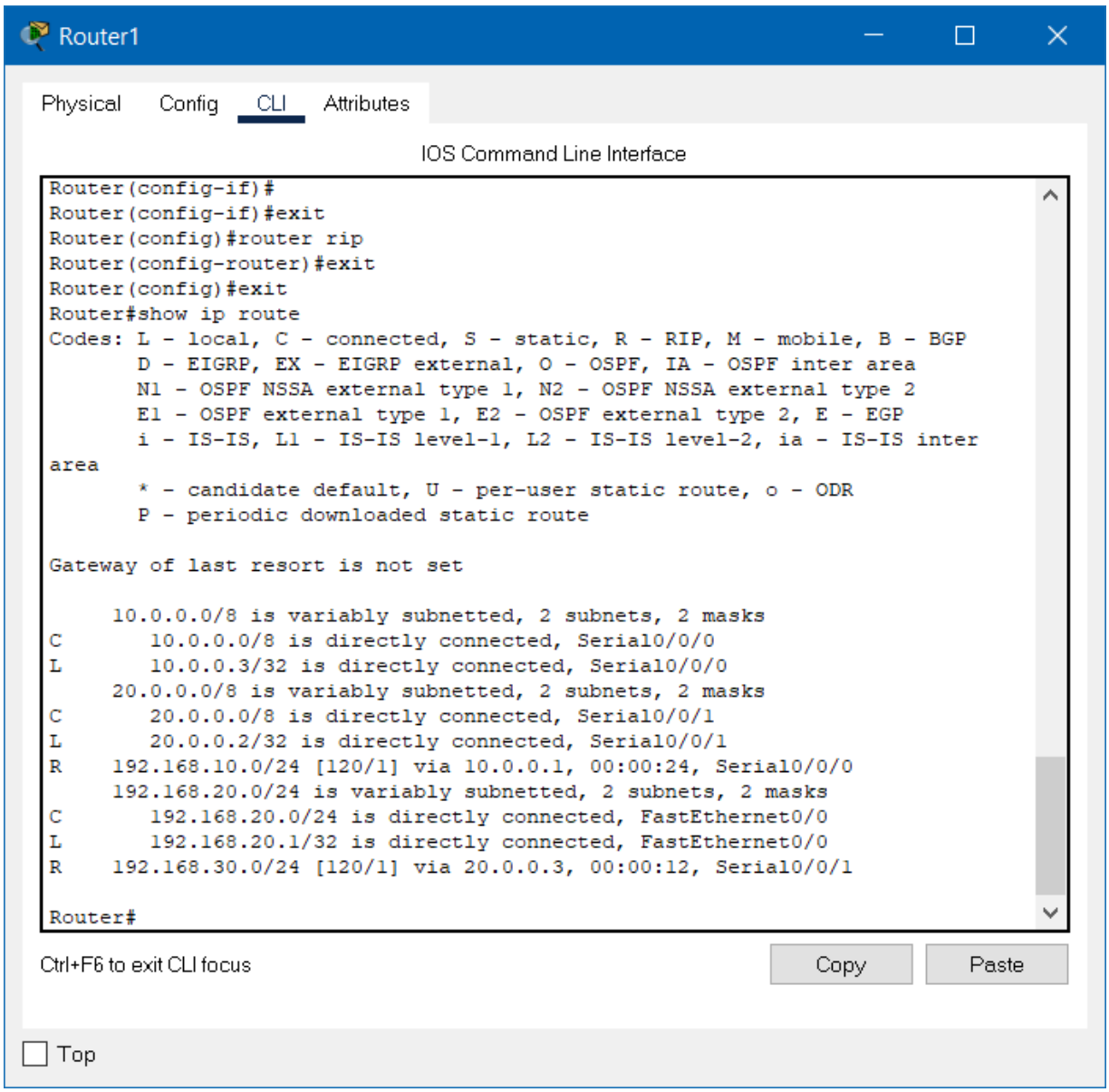
Screenshots of the CLI for the Routers showing the route for the routers.

Command used: show ip route

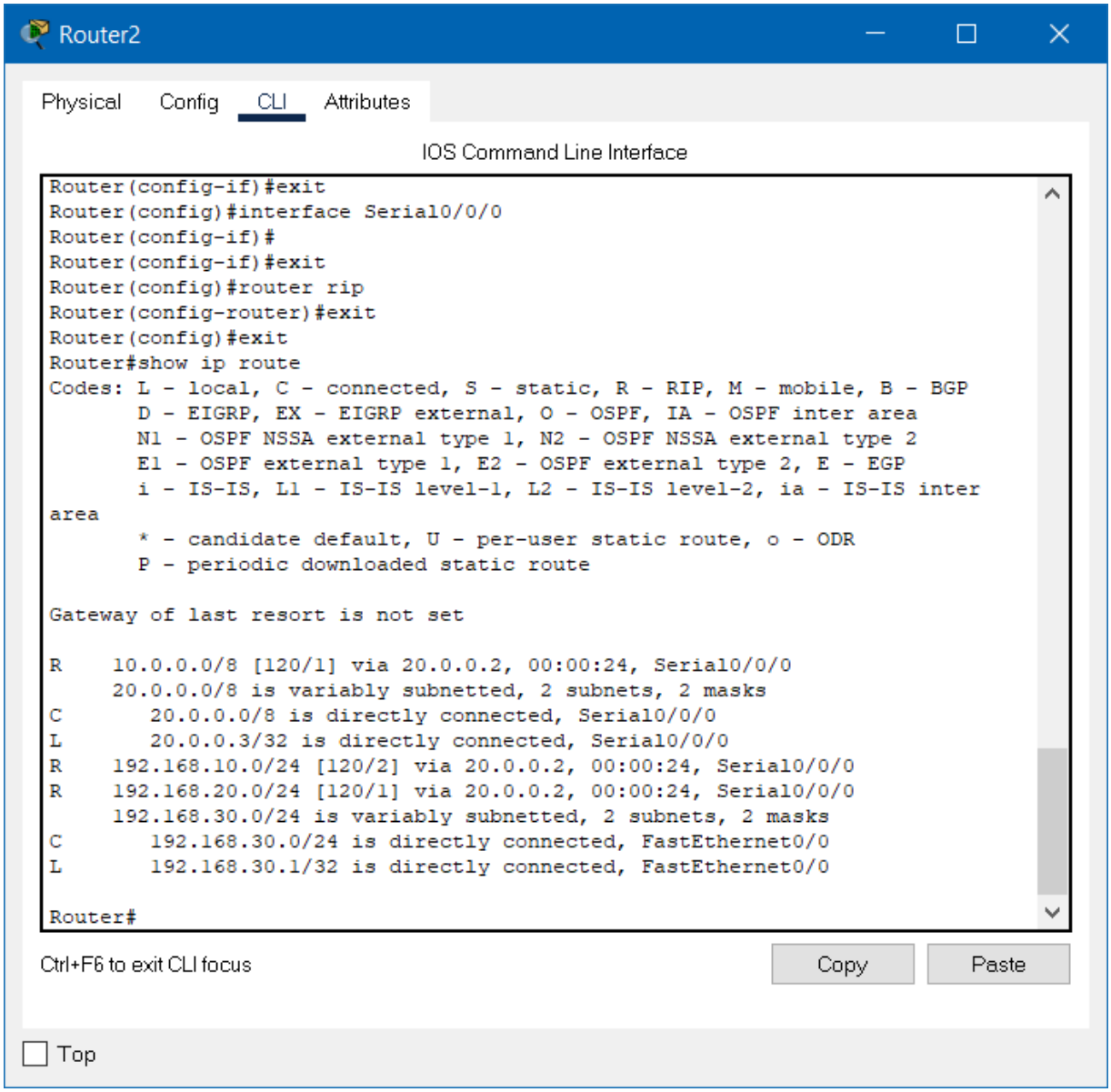
Router0:



Router1:


Router1
Physical
Config
CLI
Attributes
IOS Command Line Interface
Router(config-if)#
Router(config-if)#exit
Router(config)#router rip
Router(config-router)#exit
Router(config)#exit
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
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 10.0.0.0/8 is directly connected, Serial0/0/0
L 10.0.0.3/32 is directly connected, Serial0/0/0
20.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 20.0.0.0/8 is directly connected, Serial0/0/1
L 20.0.0.2/32 is directly connected, Serial0/0/1
R 192.168.10.0/24 [120/1] via 10.0.0.1, 00:00:24, Serial0/0/0
192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
C 192.168.20.0/24 is directly connected, FastEthernet0/0
L 192.168.20.1/32 is directly connected, FastEthernet0/0
R 192.168.30.0/24 [120/1] via 20.0.0.3, 00:00:12, Serial0/0/1
Router#
Ctrl+F6 to exit CLI focus
Copy
Paste
Top

Router2:



THANK YOU