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Assignment Submission II

Static Routing Simulation using Cisco Packet Tracer

Key Ideas

1) What is Static Routing ?

Static Routing is a kind of routing schema where the router is configured manually mainly. Meaning the routing information and IP configuration is done manually by the network engineer or network administrator.

2) What is Dynamic Routing ?

Dynamic Routing is the type of routing where the router can send and receive data based on the current circumstances of the network. It is also called adaptive routing since this schema can adapt to different situations of network flow.

3) Static and Dynamic Routing Difference

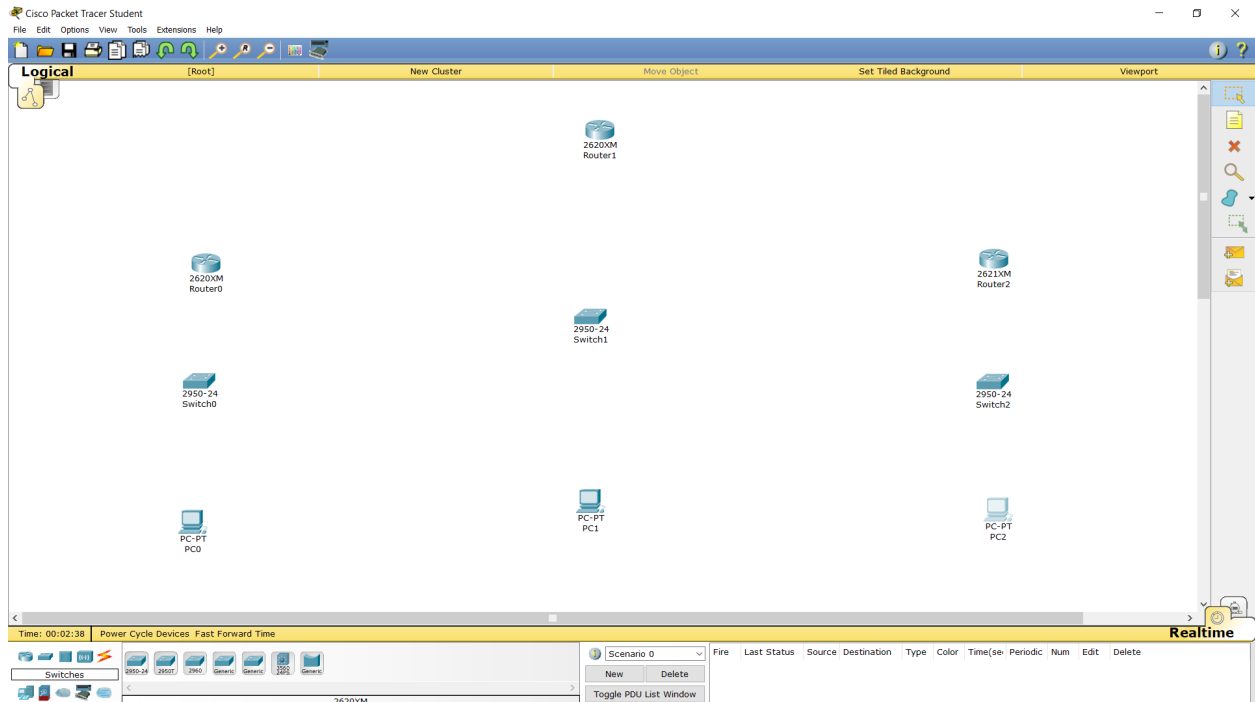
Static Routing	Dynamic Routing
Routing tables are updated manually.	Routing tables are updated automatically.
Good fit for small networks and star topologies.	Perfect fit for large networks.
Requires less bandwidth.	Requires large bandwidth.
Doesn't use any protocols or algorithms.	Uses complex protocols and algorithms for calculating routing operations.
Routers won't change when the network changes.	Routers change when the network changes.

4) What is Clock Rate ?

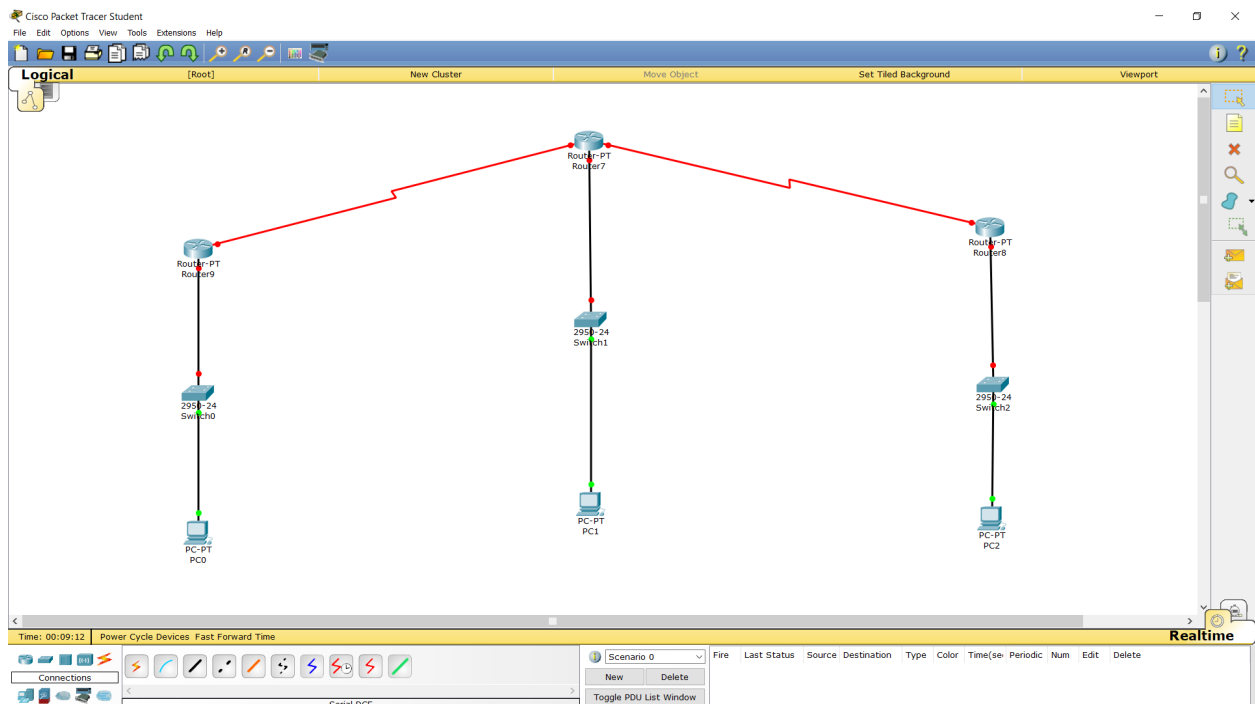
Used for synchronizing the receiver router on the other side of the network by generating transmission of signal in bits.

Simulating Static Routing using Cisco Packet Tracer

1) Place the network components on the workspace



2) Connect the components using the appropriate cables



- 3) Configure the IP address for the routers which will be used as a default gateway for the computers connected under them.

The screenshot shows the Router9 configuration window with the 'Config' tab selected. The left sidebar contains a tree view with categories: GLOBAL, ROUTING, and INTERFACE. Under INTERFACE, 'FastEthernet0/0' is selected. The main area displays the configuration for 'FastEthernet0/0'. The 'Port Status' is checked 'On'. 'Bandwidth' is set to '100 Mbps' and 'Duplex' is set to 'Full Duplex', both with 'Auto' checked. The 'MAC Address' is '0060.2F96.393D'. The 'IP Configuration' section shows 'IP Address' as '191.168.1.1' and 'Subnet Mask' as '255.255.0.0'. The 'Tx Ring Limit' is set to '10'. At the bottom, the 'Equivalent IOS Commands' section shows two commands: '%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up' and '%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up'.

Router9

Physical Config CLI

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

INTERFACE

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

FastEthernet0/0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0060.2F96.393D

IP Configuration

IP Address 191.168.1.1

Subnet Mask 255.255.0.0

Tx Ring Limit 10

Equivalent IOS Commands

```
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up
```

Router7

Physical

Config

CLI

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

INTERFACE

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

FastEthernet0/0

Port Status ☒ On

Bandwidth ☒ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address

IP Configuration

IP Address

Subnet Mask

Tx Ring Limit

Equivalent IOS Commands

```
ip address 192.168.2.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
```

Router8

Physical Config CLI

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

INTERFACE

FastEthernet0/0

FastEthernet1/0

Serial2/0

Serial3/0

FastEthernet4/0

FastEthernet5/0

FastEthernet0/0

Port Status ☒ On

Bandwidth ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 0001.428B.88BA

IP Configuration

IP Address 192.168.3.1

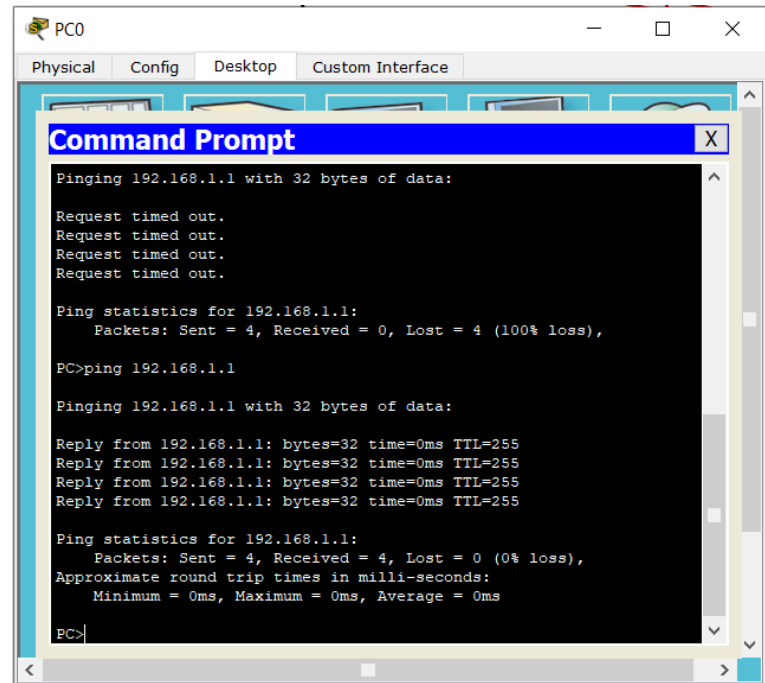
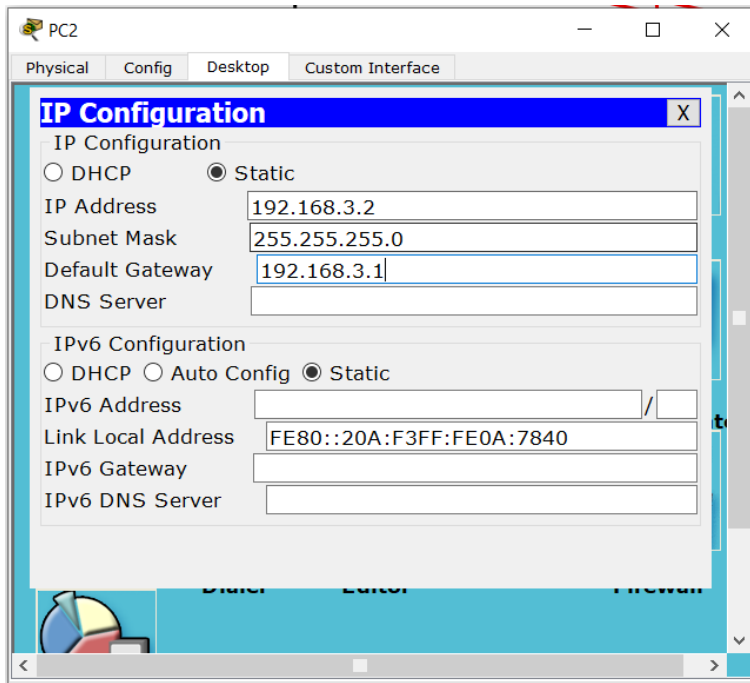
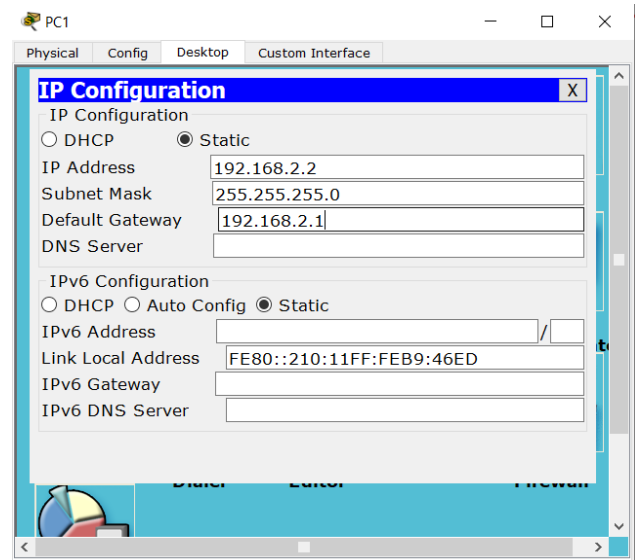
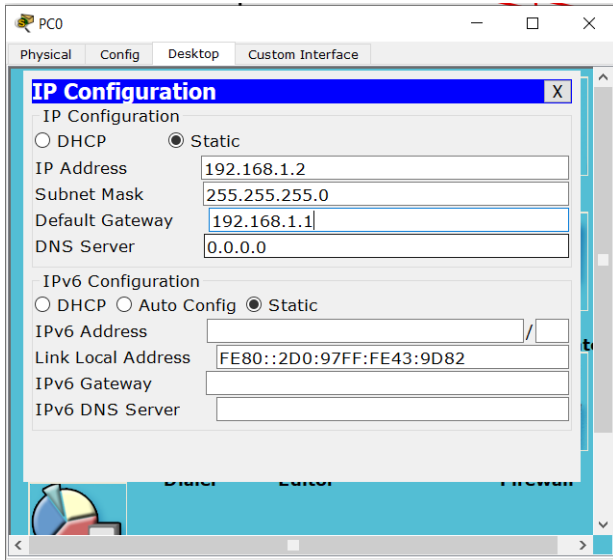
Subnet Mask 255.255.255.0

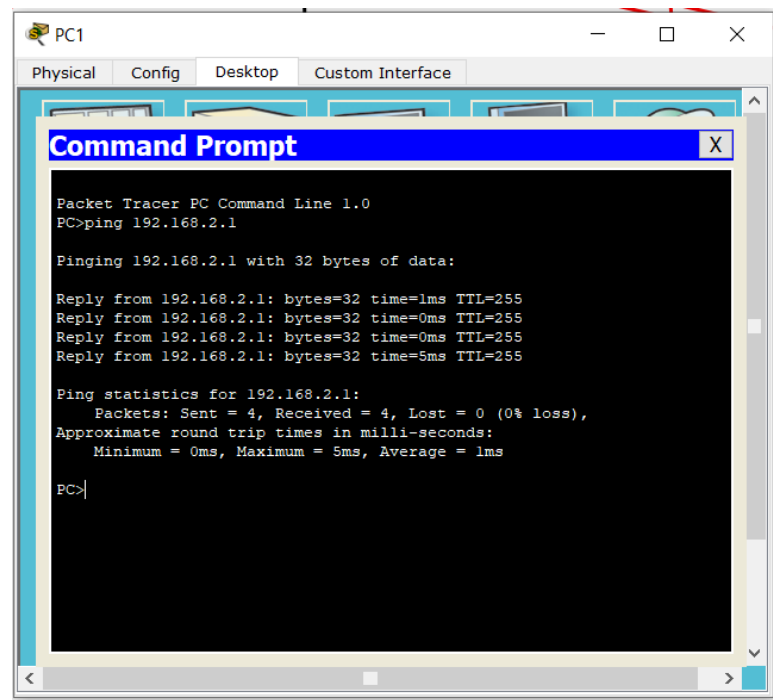
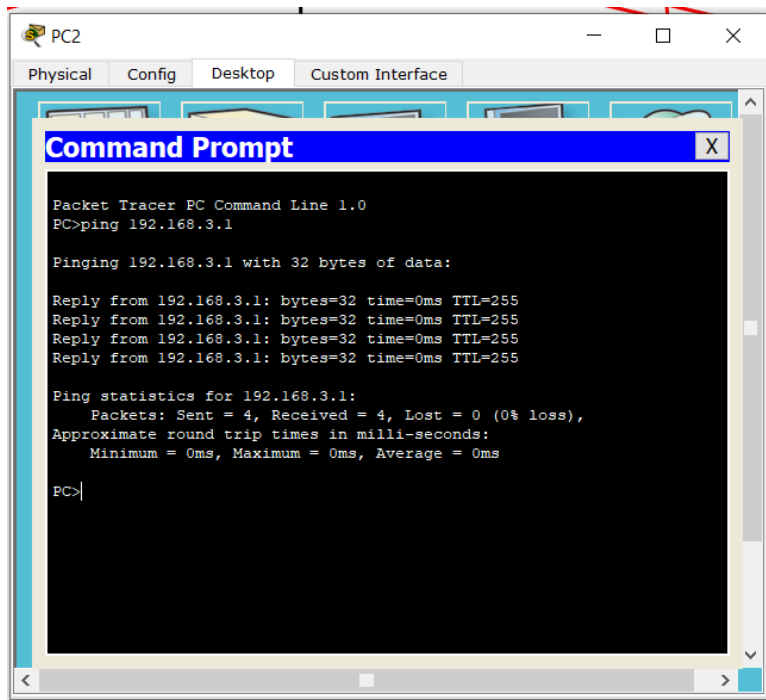
Tx Ring Limit 10

Equivalent IOS Commands

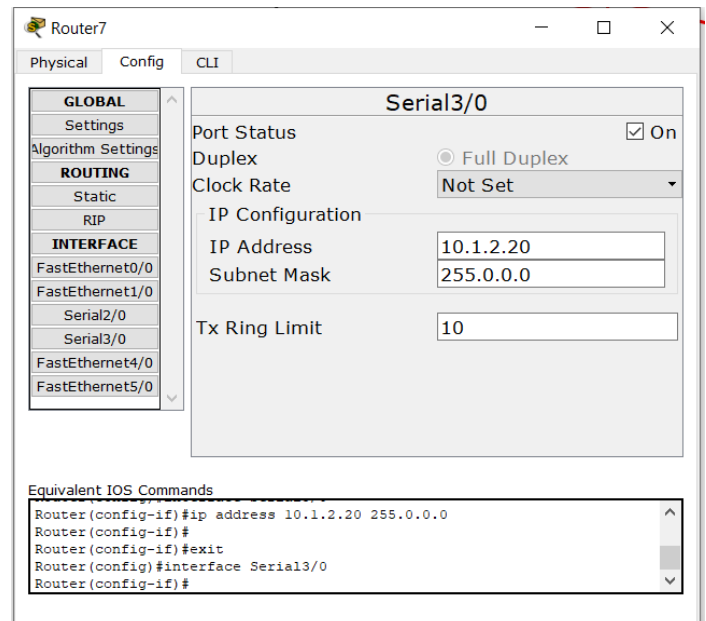
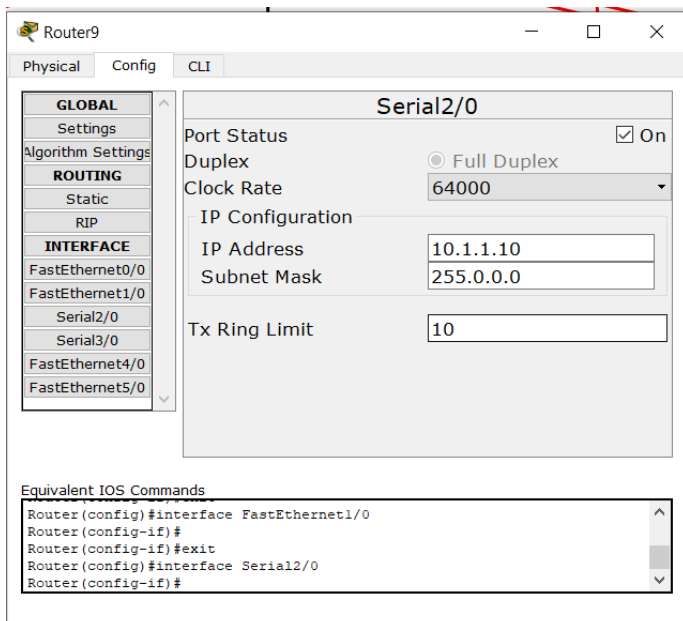
```
Router(config-if)#ip address 192.168.3.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet0/0
Router(config-if)#
```

3) Configure the individual computers IP address and try ping command to their default router gateway.

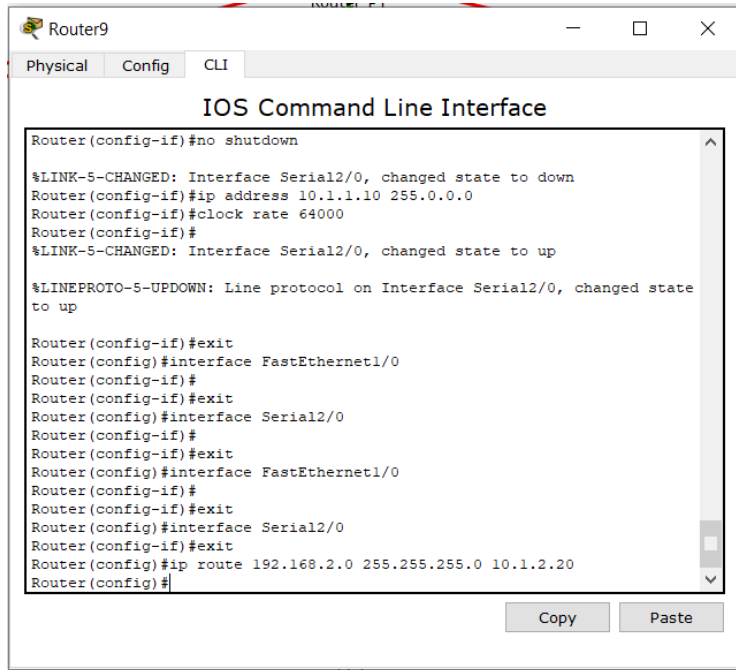




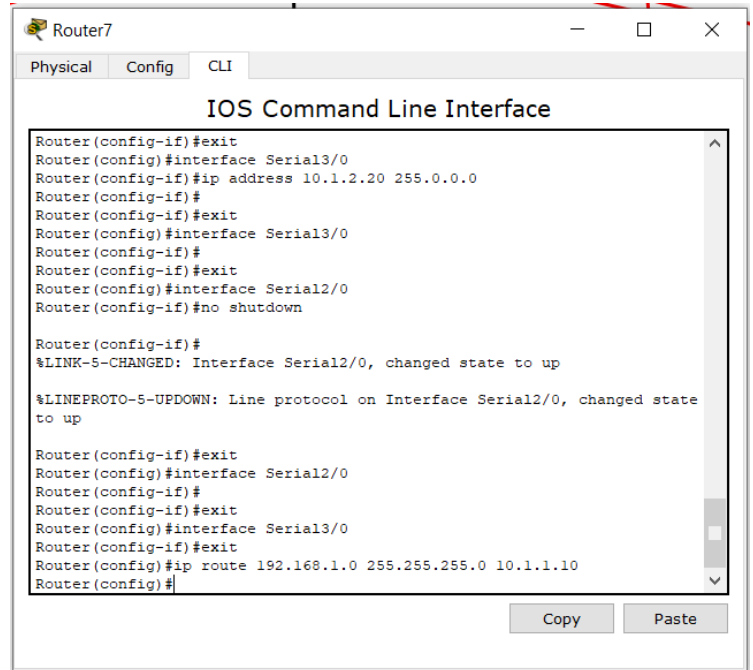
4) Configure the routers and prepare them for static routing.



4) Use static routing to configure the routers. Basic command for static routing is *ip route <destination network id> <destination subnet mask> <destination public ip>*

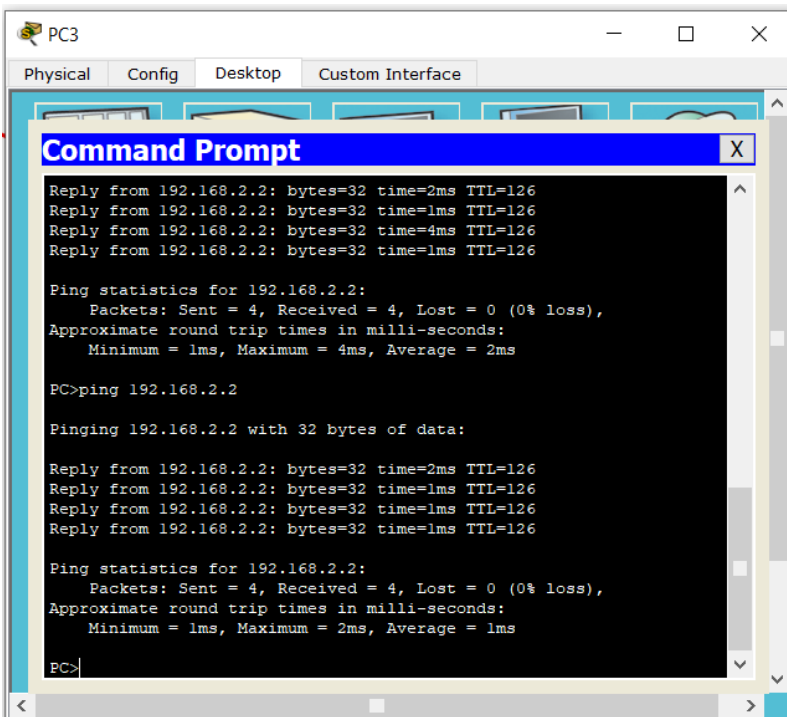


```
Router9
Physical Config CLI
IOS Command Line Interface
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial2/0, changed state to down
Router(config-if)#ip address 10.1.1.10 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface FastEthernet1/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#exit
Router(config)#ip route 192.168.2.0 255.255.255.0 10.1.2.20
Router(config)#
```



```
Router7
Physical Config CLI
IOS Command Line Interface
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#ip address 10.1.2.20 255.0.0.0
Router(config-if)#
Router(config)#interface Serial3/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#no shutdown
%LINK-5-CHANGED: Interface Serial2/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial2/0, changed state to up
Router(config-if)#exit
Router(config)#interface Serial2/0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial3/0
Router(config-if)#exit
Router(config)#ip route 192.168.1.0 255.255.255.0 10.1.1.10
Router(config)#
```

4) Using the ping command will show us the connection success



```
PC3
Physical Config Desktop Custom Interface
Command Prompt
Reply from 192.168.2.2: bytes=32 time=2ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=4ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 4ms, Average = 2ms

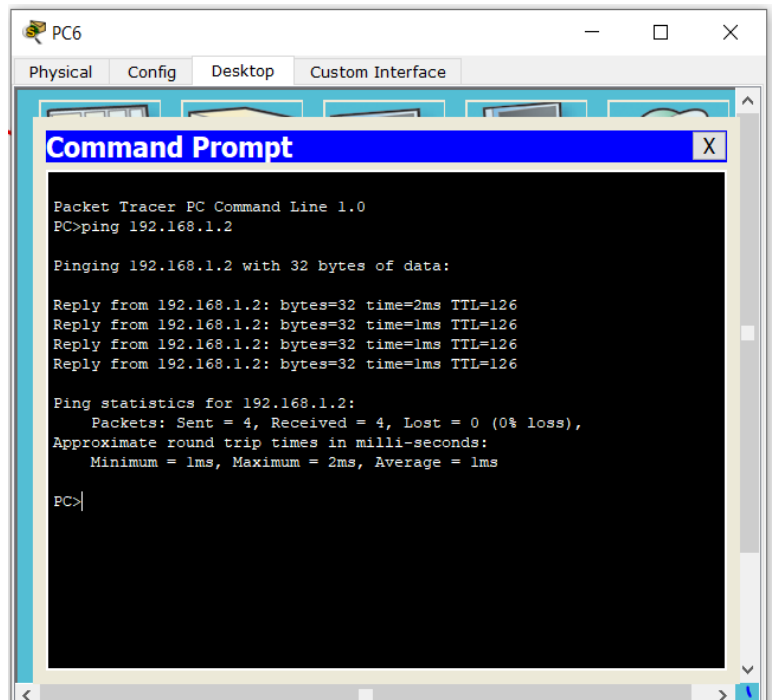
PC>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=2ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126
Reply from 192.168.2.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

PC>
```



```
PC6
Physical Config Desktop Custom Interface
Command Prompt
Packet Tracer PC Command Line 1.0
PC>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=2ms TTL=126
Reply from 192.168.1.2: bytes=32 time=1ms TTL=126
Reply from 192.168.1.2: bytes=32 time=1ms TTL=126
Reply from 192.168.1.2: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 2ms, Average = 1ms

PC>
```

The final network structure will look something like below

