

OSPF Routing Configuration

Disclaimer: this was the second practical exercise done in class. This activity belongs to Eduvos – I just wanted to show the skills learnt throughout my degree.

Step 1: Add and Connect the Devices

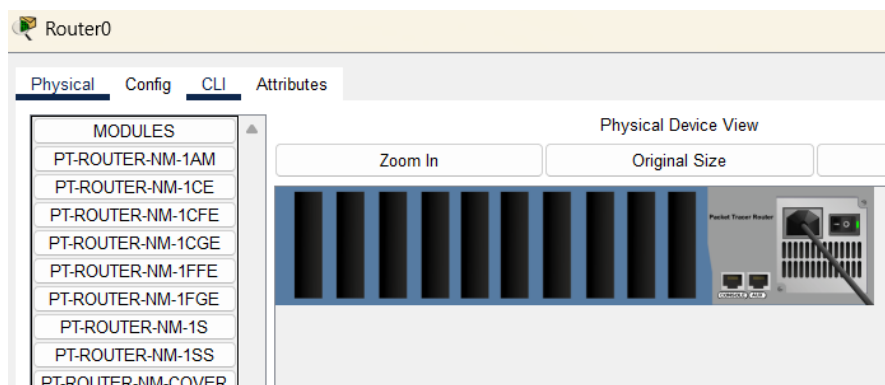
DEVICES:	DEFAULT NAME:	NEW NAME:
PT-Empty Router	Router0	R0
	Router1	R1
	Router2	R2
2960-24TT Switch	Switch0	S0
	Switch1	S1
	Switch2	S2
PC-PT PC	PC0	PC0
	PC1	PC1
	PC2	PC2
	PC3	PC3
	PC4	PC4
	PC5	PC5

Step 2: Add Ports in Routers

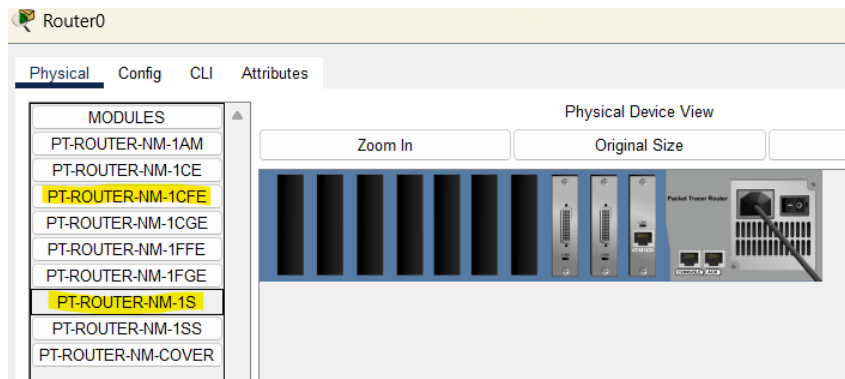
Steps:

1. Switch off the device.
2. Add the ports.
3. Switch on the devices.

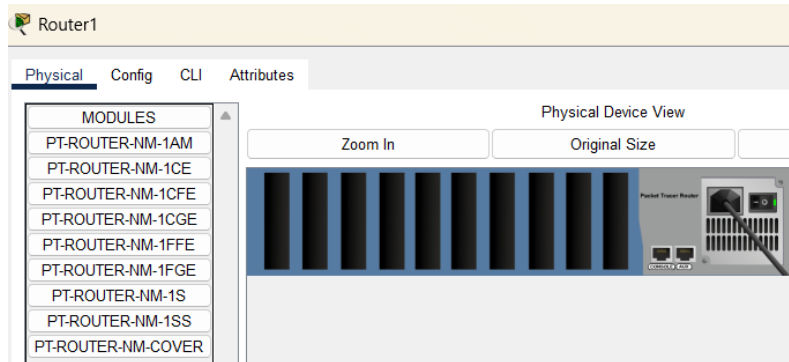
Router0 Before:



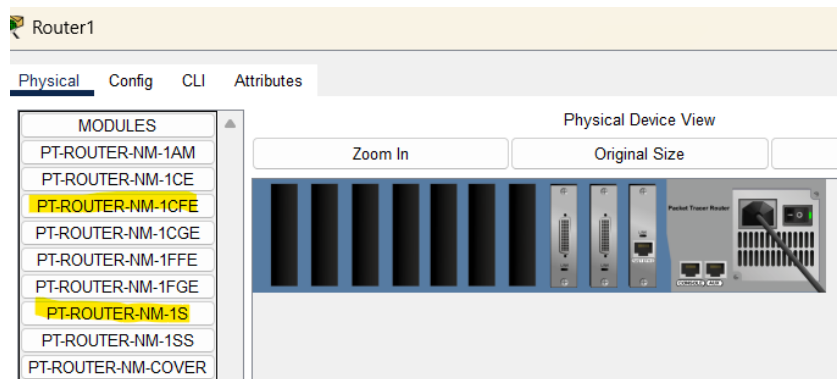
Router0 After:



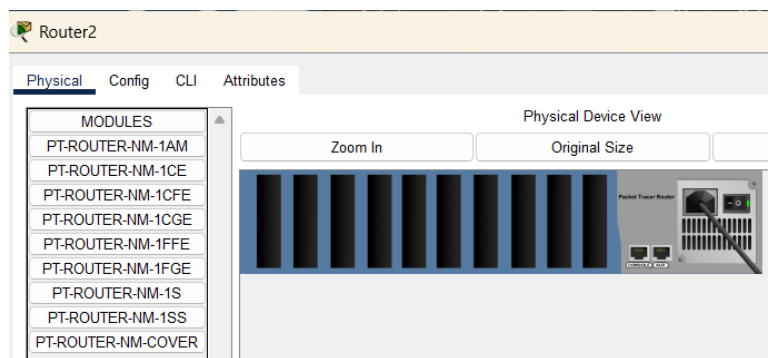
Router1 Before:



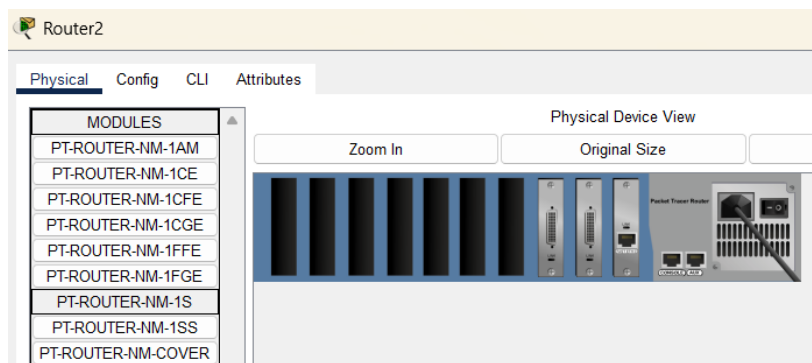
Router1 After:



Router2 Before:



Router2 After:



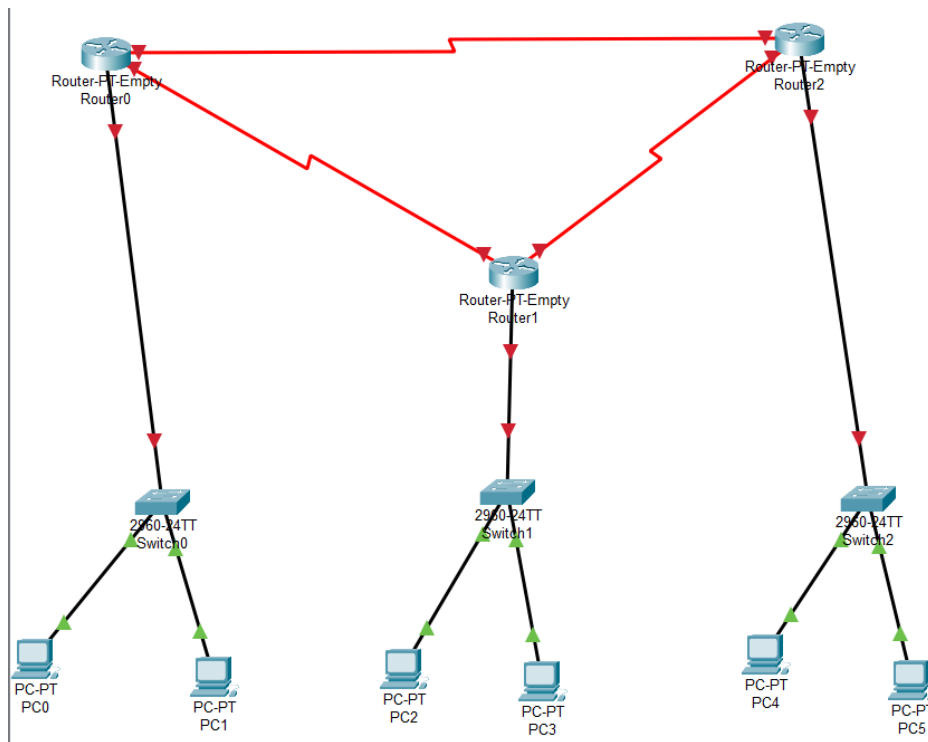
Step 3: Connect the Devices

Use a serial DCE for the routers and a copper straight-through cable was used to connect the other devices.

1. Router0 (Serial1/0) to Router1 (Serial1/0)
2. Router1 (Serial2/0) to Router2 (Serial1/0)
3. Router0 (Serial2/0) to Router2 (Serial2/0)
4. Switch0 (FastEthernet0/1) to PC0 (FastEthernet0)
5. Switch0 (FastEthernet0/2) to PC1 (FastEthernet0)
6. Switch1 (FastEthernet0/1) to PC2 (FastEthernet0)
7. Switch1 (FastEthernet0/2) to PC3 (FastEthernet0)
8. Switch2 (FastEthernet0/1) to PC4 (FastEthernet0)
9. Switch2 (FastEthernet0/2) to PC5 (FastEthernet0)
10. Router0 (FastEthernet0/0) to Switch0 (FastEthernet0/3)

11. Router1 (FastEthernet0/0) to Switch1 (FastEthernet0/3)

12. Router2 (FastEthernet0/0) to Switch2 (FastEthernet0/3)



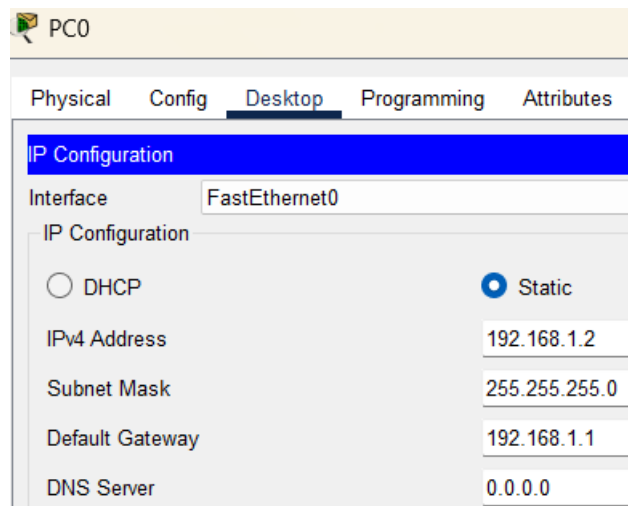
Step 4: Assign IP addresses to the PCs

PC > Desktop > IP Configuration > Enter IPv4 details

PC0:

1. **IPv4 Address:** 192.168.1.2
2. **Subnet Mask:** 255.255.255.0
3. **Default Gateway:** 192.168.1.1

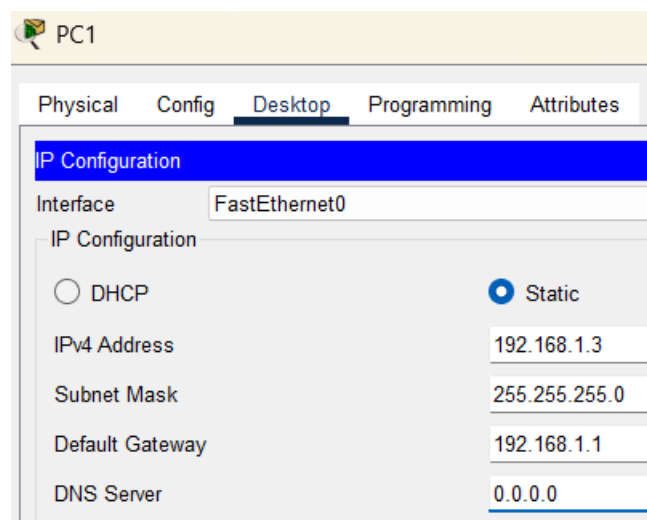
Screenshot of Output



PC1:

1. **IPv4 Address:** 192.168.1.3
2. **Subnet Mask:** 255.255.255.0
3. **Default Gateway:** 192.168.1.1

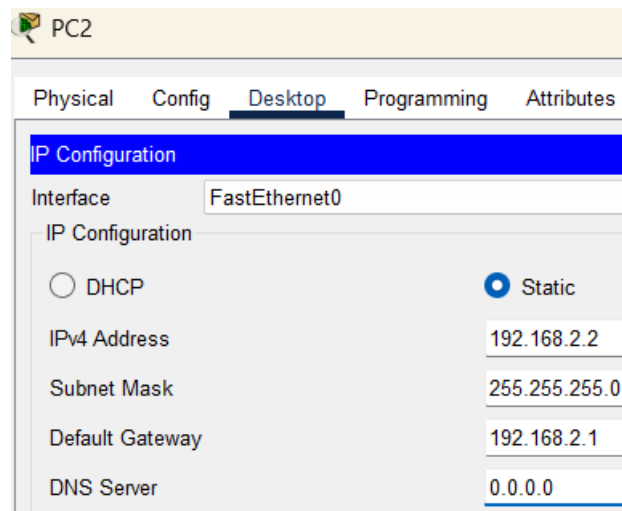
Screenshot of Output



PC2:

1. **IPv4 Address:** 192.168.2.2
2. **Subnet Mask:** 255.255.255.0
3. **Default Gateway:** 192.168.2.1

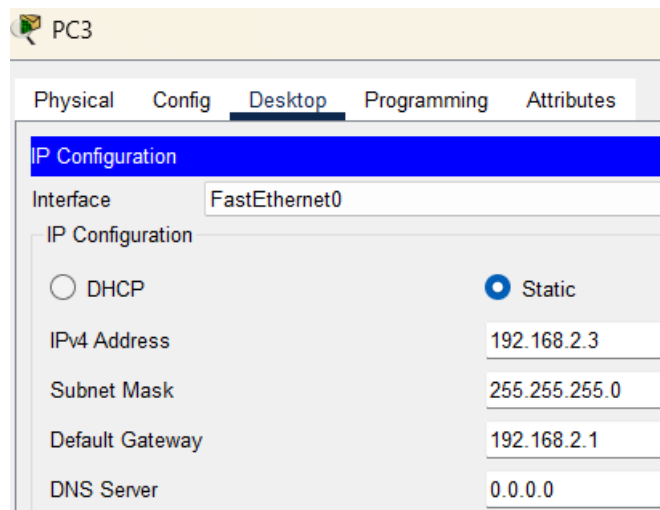
Screenshot of Output



PC3:

1. **IPv4 Address:** 192.168.2.3
2. **Subnet Mask:** 255.255.255.0
3. **Default Gateway:** 192.168.2.1

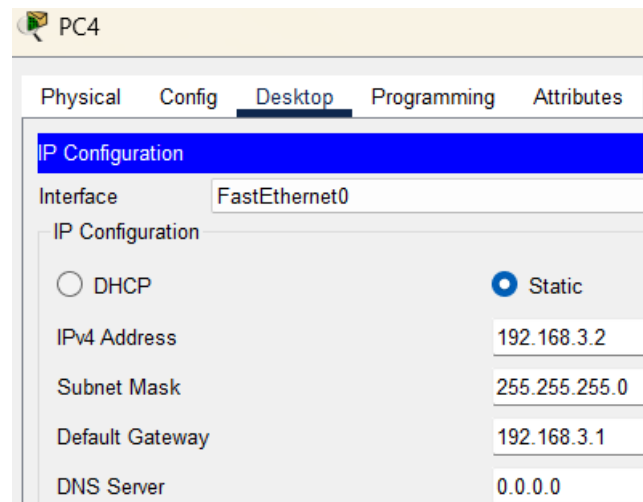
Screenshot of Output



PC4:

1. **IPv4 Address:** 192.168.3.2
2. **Subnet Mask:** 255.255.255.0
3. **Default Gateway:** 192.168.3.1

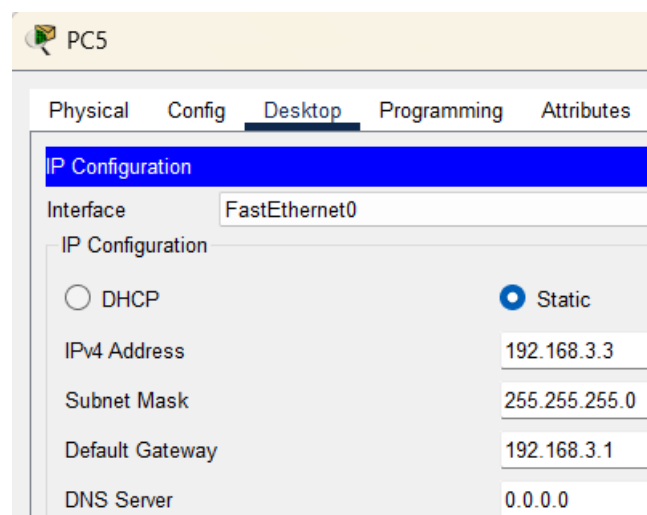
Screenshot of Output



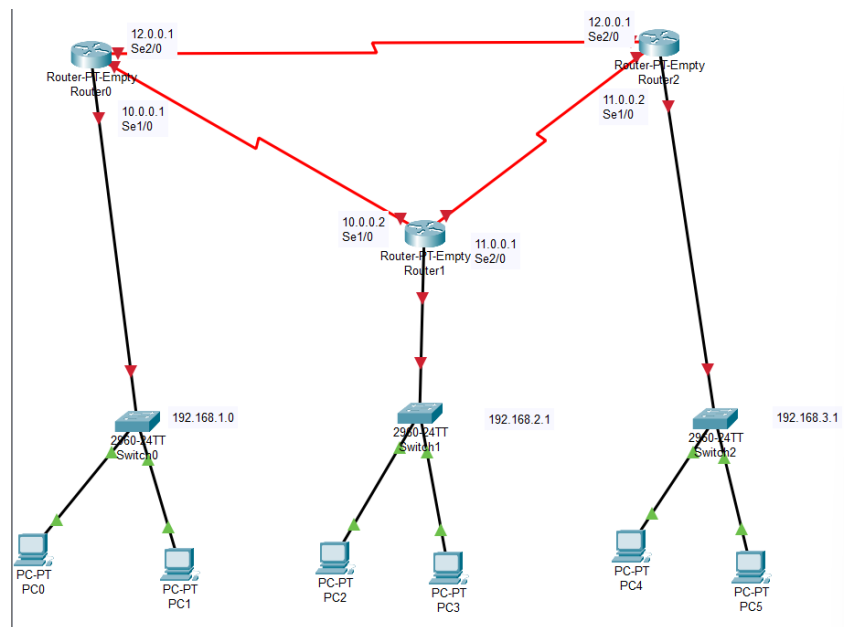
PC5:

1. **IPv4 Address:** 192.168.3.3
2. **Subnet Mask:** 255.255.255.0
3. **Default Gateway:** 192.168.3.1

Screenshot of Output



Step 5: Assign IP Addresses to the cable interfaces



Step 6: Change the Interfaces

Router0 to Router1:

These configurations were done in the Router1 CLI.

Commands Used

```
Router> en
```

```
Router# config
```

```
Router(config)# interface serial1/0
```

```
Router(config-if)# no shutdown
```

```
Router(config-if)# end
```


Screenshot of Output

```
Router>en
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial1/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial1/0, changed state to up

Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0, changed state to up
```

Router1 to Router2:

These configurations were done in the Router2 CLI.

Commands Used

```
Router> en
Router# config
Router(config)# interface serial1/0
Router(config-if)# no shutdown
Router(config-if)# end
```

Screenshot of Output

```
Router>en
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface serial1/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial1/0, changed state to up

Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```

Router0 to Router2:

These configurations were done in the Router2 CLI.

Commands Used

```
Router> en
```

```
Router# config
```

```
Router(config)# interface serial2/0
```

```
Router(config-if)# no shutdown
```

```
Router(config-if)# end
```

Screenshot of Output

```
Router>en
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface serial2/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface Serial2/0, changed state to up

Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
```

Router1 to Switch1:

These configurations were done in the Router1 CLI.

Commands Used

```
Router> en
```

```
Router# config
```

```
Router(config)# interface FastEthernet0/0
```

```
Router(config-if)# no shutdown
```

```
Router(config-if)# end
```

Screenshot of Output

```
Router(config-if)#exit
Router(config)#interface gigabitethernet0/0
%Invalid interface type and number
Router(config)#interface fastethernet0/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```

Router1 to Switch1:

These configurations were done in the Router2 CLI.

Commands Used

Router> en

Router# config

Router(config)# interface FastEthernet0/0

Router(config-if)# no shutdown

Router(config-if)# end

Screenshot of Output

```
Router>en
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface fastethernet0/0
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

Router(config-if)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#
```

Step 7: Configure the Interfaces in Router0

Commands Used

```
R0> en
```

```
R0# config
```

```
R0(config)# interface FastEthernet0/0
```

```
R0(config-if)# ip address 192.168.1.1 255.255.255.0
```

```
R0(config-if)# no shutdown
```

```
R0(config-if)# exit
```

```
R0(config)# interfaceserial1/0
```

```
R0(config-if)# ip address 10.0.0.1 255.0.0.0
```

```
R0(config-if)# clock rate 64000
```

```
R0(config-if)# no shutdown
```

```
R0(config-if)# exit
```

```
R0(config)# interfaceserial2/0
```

```
R0(config-if)# ip address 12.0.0.1 255.0.0.0
```

```
R0(config-if)# clock rate 64000
```

```
R0(config-if)# no shutdown
```

```
R0(config-if)# exit
```

Screenshot of Output

```
R0>en
R0#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
R0(config)#interface fastethernet0/0
R0(config-if)#ip address 192.168.1.1 255.255.255.0
R0(config-if)#no shutdown

R0(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

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

R0(config-if)#exit
R0(config)#interface serial0/0
%Invalid interface type and number
R0(config)#interface serial1/0
R0(config-if)#ip address 10.0.0.1 255.0.0.0
R0(config-if)#clock rate 64000
This command applies only to DCE interfaces
R0(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial1/0, changed state to down
R0(config-if)#
R0(config-if)#interface serial1/0
R0(config-if)#no shutdown
R0(config-if)#exit
R0(config)#interface serial2/0
R0(config-if)#ip address 12.0.0.1 255.0.0.0
R0(config-if)#clock rate 64000
This command applies only to DCE interfaces
R0(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial2/0, changed state to down
R0(config-if)#
```

Step 8: Configure the OSPF in Router0

Commands Used

Router0> en

Router0# config

Router0(config)# router ospf 1

Router0(config-router)# network 192.168.1.0 0.0.0.255 area 0

Router0(config-router)# network 10.0.0.0 0.255.255.255 area 0

Router0(config-router)# network 12.0.0.0 0.255.255.255 area 0

Screenshot of Output

```
Router0>en
Router0#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router0(config)#router ospf 1
Router0(config-router)#network 192.168.1.0 0.0.0.255 area 0
Router0(config-router)#network 10.0.0.0 0.255.255.255 area 0
Router0(config-router)#network 12.0.0.0 0.255.255.255 area 0
```

Step 9: Configure the Interfaces in Router1

Commands Used

Router> en

Router# config

Router(config)# interface FastEthernet0/0

Router(config-if)# ip address 192.168.2.1 255.255.255.0

Router(config-if)# no shutdown

Router(config-if)# exit

Router(config)# interface serial2/0

Router(config-if)# ip address 11.0.0.1 255.0.0.0

Router(config-if)# clock rate 64000

Router(config-if)# no shutdown

Router(config-if)# exit

Screenshot of Output

```
Router>en
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#clock rate 64000
^
% Invalid input detected at '^' marker.

Router(config-if)#exit
Router(config)#interface serial2/0
Router(config-if)#ip address 11.0.0.1 255.0.0.0
Router(config-if)#clock rate 64000
This command applies only to DCE interfaces
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#
```

Step 10: Configure the OSPF in Router1

Commands Used

Router> en

Router# config

Router(config)# router ospf 1

Router(config-router)# network 192.168.2.0 0.0.0.255 area 0

Router(config-router)# network 10.0.0.0 0.255.255.255 area 0

Router(config-router)# network 11.0.0.0 0.255.255.255 area 0

Router(config-router)# exit

Screenshot of Output

```
Router>en
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router ospf 1
Router(config-router)#network 192.168.2.0 0.0.0.255 area 0
Router(config-router)#network 10.0.0.0 0.255.255.255 area 0
Router(config-router)#network 11.0.0.0 0.255.255.255 area 0
Router(config-router)#no shutdown
                        ^
% Invalid input detected at '^' marker.

Router(config-router)#
Router(config-router)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console

Router#|
```

Step 11: Configure the interfaces in Router2

Commands Used

Router> en

Router# config

Router(config)# interface FastEthernet0/0

Router(config-if)# ip address 192.168.3.1 255.255.255.0

Router(config-if)# no shutdown

Router(config-if)# exit

```
Router(config)# interface serial2/0
Router(config-if)# ip address 12.0.0.1 255.0.0.0
Router(config-if)# clock rate 64000
Router(config-if)# no shutdown
Router(config-if)# exit
```

Screenshot of Output

```
Router>en
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 192.168.3.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#interface serial2/0
Router(config-if)#ip address 12.0.0.1 255.0.0.0
Router(config-if)#clock rate 64000
Router(config-if)#no shutdown
Router(config-if)#exit
Router(config)#|
```

Step 12: Configure the OSPF in Router2

Commands Used

```
Router> en
Router# config
Router(config)# router ospf 1
Router(config-router)# network 192.168.3.0 0.0.0.255 area 0
Router(config-router)# network 10.0.0.0 0.255.255.255 area 0
Router(config-router)# network 11.0.0.0 0.255.255.255 area 0
Router(config-router)# exit
```


Screenshot of Output

```
Router>en
Router#config
Configuring from terminal, memory, or network [terminal]?
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#router ospf 1
      ^
% Invalid input detected at '^' marker.

Router(config)#router ospf 1
Router(config-router)#
Router(config-router)#network 192.168.3.0 0.0.0.255 area 0
Router(config-router)#network 10.0.0.0 0.255.255.255 area 0
Router(config-router)#network 11.0.0.0 0.255.255.255 area 0
      ^
% Invalid input detected at '^' marker.

Router(config-router)#network 11.0.0.0 0.255.255.255 area 0
Router(config-router)#exit
Router(config)#end
Router#
%SYS-5-CONFIG_I: Configured from console by console
```