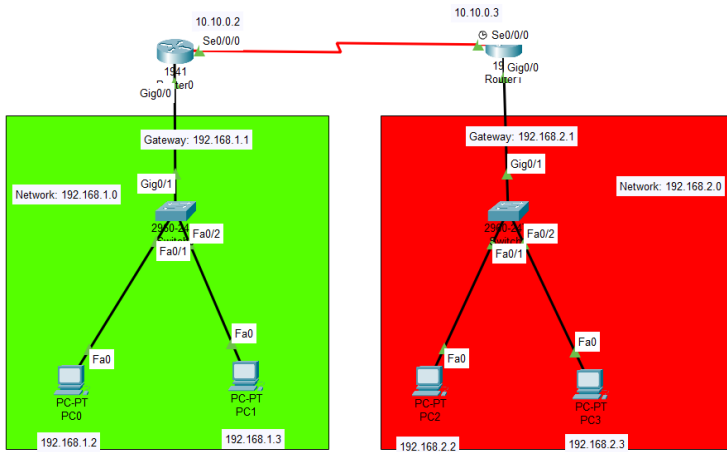


Configuration of ARP and Static Routing using Cisco network switch and verify the connectivity



Dr. G. Omprakash

Assistant Professor, ECE, KLEF





Devices and Connections

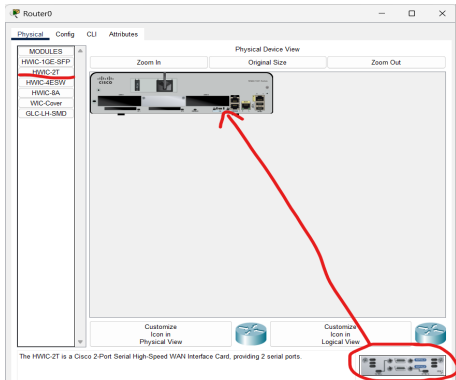
- Select two routers (Model: 1941) and place them on the workspace
- Select two switches (Model: 2960) and place them on the workspace
- Select four PCs and place them on the workspace
- Connections for left-side switch
 - Use a Copper straight-through and connect
 - FastEthernet of PC0 \Rightarrow FastEthernet0/1 of the switch
 - FastEthernet of PC1 \Rightarrow FastEthernet0/2 of the switch
 - GigabitEthernet0/1 of switch to GigabitEthernet0/0 of the left-side router
- Connections for right-side switch
 - Use a Copper straight-through and connect
 - FastEthernet of PC2 \Rightarrow FastEthernet0/1 of the switch
 - FastEthernet of PC3 \Rightarrow FastEthernet0/2 of the switch
 - GigabitEthernet0/1 of switch to GigabitEthernet0/0 of the right-side router

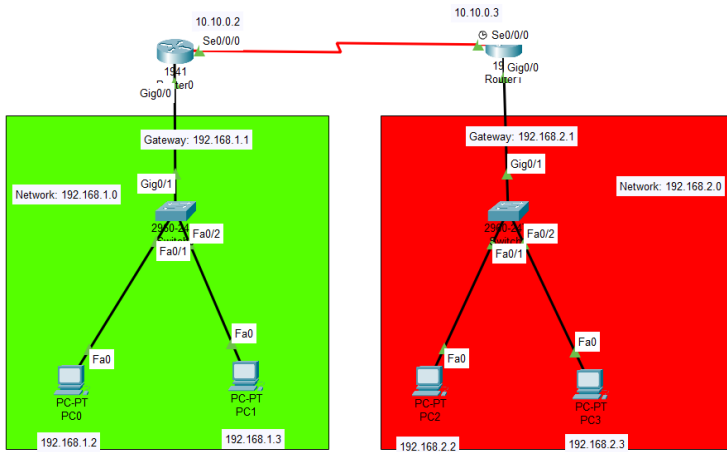


Router -Router Connection

Serial ports are required for connecting the routers

- Switch-OFF the Router
- Drag and Drop the HWIC-2T module on the empty rack of the router
- Switch-ON the Router
- Repeat this step for the second router
- Use Serial DTE wire to connect the serial ports of both the routers (Se0/0/0 ↔ Se0/0/0)







Assign IP Address

Click on PC → Desktop Tab → IP Configuration

- PC0: IPv4: 192.168.1.2; SubMask:255.255.255.0; Gateway: 192.168.1.1
- PC1: IPv4: 192.168.1.3; Sub Mask:255.255.255.0; Gateway: 192.168.1.1
- PC2: IPv4: 192.168.2.2; Sub Mask:255.255.255.0; Gateway: 192.168.2.1
- PC3: IPv4: 192.168.2.3; Sub Mask:255.255.255.0; Gateway: 192.168.2.1



Configuring Gigabit Interface of router (Left)

Router0

Physical Config CLI Attributes

GLOBAL

- Settings
- Algorithm Settings

ROUTING

- Static
- RIP

SWITCHING

- VLAN Database

INTERFACE

- GigabitEthernet0/0**
- GigabitEthernet0/1
- Serial0/0/0
- Serial0/0/1

GigabitEthernet0/0

Port Status ☒ On

Bandwidth ☐ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☐ Full Duplex ☒ Auto

MAC Address 0060.2F94.D801

IP Configuration

IPv4 Address 192.168.1.1

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Equivalent IOS Commands

```
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
```



Configuring Serial Interface of router (Left)

Router0

Physical **Config** CLI Attributes

GLOBAL

- Settings
- Algorithm Settings

ROUTING

- Static
- RIP

SWITCHING

- VLAN Database

INTERFACE

- GigabitEthernet0/0
- GigabitEthernet0/1
- Serial0/0/0**
- Serial0/0/1

Serial0/0/0

Port Status ☒ On

Duplex ☐ Full Duplex

Clock Rate 2000000

IP Configuration

IPv4 Address 10.10.0.2

Subnet Mask 255.0.0.0

Tx Ring Limit 10

Equivalent IOS Commands

```
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#ip address 10.10.0.2 255.0.0.0
Router(config-if)#ip address 10.10.0.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
```




Configuring Static routing table of the router (left)

The screenshot shows the configuration window for Router0. The 'Config' tab is active, and the 'ROUTING' section is expanded, with 'Static' selected. The 'Static Routes' table is visible, showing a route for Network 192.168.2.0, Mask 255.255.255.0, and Next Hop 10.10.0.3. The 'Add' button is highlighted. The 'Equivalent IOS Commands' section at the bottom shows the configuration commands for the router.

Static Routes

Network	Mask	Next Hop
192.168.2.0	255.255.255.0	10.10.0.3

Add

Network Address

192.168.2.0/24 via 10.10.0.3

Remove

Equivalent IOS Commands

```
LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#ip address 10.10.0.2 255.0.0.0
Router(config-if)#ip address 10.10.0.2 255.0.0.0
Router(config-if)#no shutdown
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#ip route 192.168.2.0 255.255.255.0 10.10.0.3
Router(config)#
```



Configuring Gigabit Interface of router (Right)

Router1

Physical **Config** CLI Attributes

GLOBAL

- Settings
- Algorithm Settings

ROUTING

- Static
- RIP

SWITCHING

- VLAN Database

INTERFACE

- GigabitEthernet0/0**
- GigabitEthernet0/1
- Serial0/0/0
- Serial0/0/1

GigabitEthernet0/0

Port Status ☒ On

Bandwidth ☐ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto

Duplex ☐ Half Duplex ☐ Full Duplex ☒ Auto

MAC Address 00E0.F9B6.4201

IP Configuration

IPv4 Address 192.168.2.1

Subnet Mask 255.255.255.0

Tx Ring Limit 10

Equivalent IOS Commands

```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interface GigabitEthernet0/0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up
ip address 192.168.2.1 255.255.255.0
Router(config-if)#
```



Configuring Serial Interface of router (Right)

Router1

Physical Config CLI Attributes

GLOBAL

- Settings
- Algorithm Settings

ROUTING

- Static
- RIP

SWITCHING

- VLAN Database

INTERFACE

- GigabitEthernet0/0
- GigabitEthernet0/1
- Serial0/0/0**
- Serial0/0/1

Serial0/0/0

Port Status ☒ On

Duplex ☐ Full Duplex

Clock Rate 2000000

IP Configuration

IPv4 Address 10.10.0.3

Subnet Mask 255.0.0.0

Tx Ring Limit 10

Equivalent IOS Commands

```
ip address 192.168.2.1 255.255.255.0
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#
Router(config-if)#exit
Router(config)#interface Serial0/0/0
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
ip address 10.10.0.3 255.0.0.0
Router(config-if)#
```



Configuring Static routing table of the router (Right)

Router1

Physical Config CLI Attributes

GLOBAL

- Settings
- Algorithm Settings
- ROUTING**
 - Static**
 - RIP
- SWITCHING**
 - VLAN Database
- INTERFACE**
 - GigabitEthernet0/0
 - GigabitEthernet0/1
 - Serial0/0/0
 - Serial0/0/1

Static Routes

Network: 192.168.1.0
Mask: 255.255.255.0
Next Hop: 10.10.0.2

Add

Network Address
192.168.1.0/24 via 10.10.0.2

Remove

Equivalent IOS Commands

```
Router(config-if)#no shutdown
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0/0, changed state to up
ip address 10.10.0.3 255.0.0.0
Router(config-if)#ip address 10.10.0.3 255.0.0.0
Router(config-if)#
Router(config-if)#exit
Router(config)#
Router(config)#ip route 192.168.1.0 255.255.255.0 10.10.0.2
Router(config)#
```



Check Connection

Ping the PCs to check connection. Every PC is connected to every other PC

For multiple networks:

https://youtu.be/rZw_b0wpQ00?si=CTX54aCtjHj8iKcE



Inspect Routing Tables

Select Inspect Icon \Rightarrow Click on the router to check routing table

Cisco Packet Tracer - C:\Users\ompg6\OneDrive\Documents\NPS_24_25\Hands_On\exp7fin.pkt

File Edit Options View Tools Extensions Window Help

Logical (Physical) x:510, y:181

Routing Table for Router0

Type	Network	Port	Next Hop IP	Metric
C	10.0.0.0/8	Serial0/0/0	---	0/0
L	10.10.0.2/32	Serial0/0/0	---	0/0
C	192.168.1.0/24	GigabitEthernet0/0	---	0/0
L	192.168.1.1/32	GigabitEthernet0/0	---	0/0
S	192.168.2.0/24	---	10.10.0.3	1/0



Inspect ARP Tables

ARP is generally automatically handled by Cisco switches and routers.
Select Inspect Icon \Rightarrow Click on the router to check ARP table

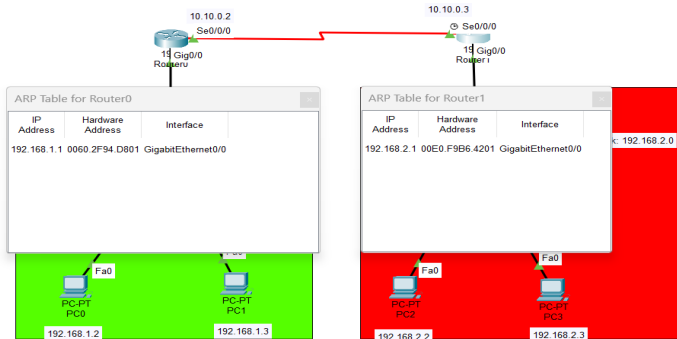


Figure: Initial Table



Inspect ARP Tables

Select Inspect Icon \Rightarrow Click on the router to check ARP table

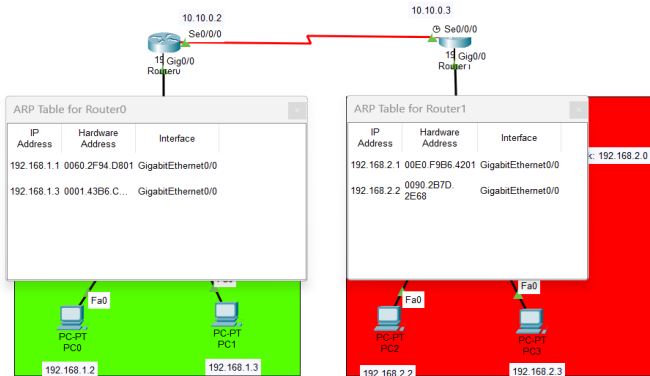


Figure: Table updated after sending message from PC1 to PC2



Inspect ARP Tables

Select Inspect Icon \Rightarrow Click on the router to check ARP table

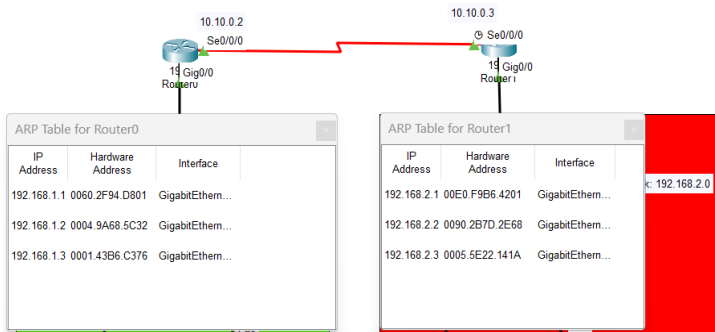


Figure: Table updated after sending message from PC0 to PC3



Conclusion

You have configured static routing for managing network traffic efficiently and ensuring proper connectivity in a multi-network environment