

CNC Lab Experiment-4

Procedure

Single Router – Inter-Network Communication

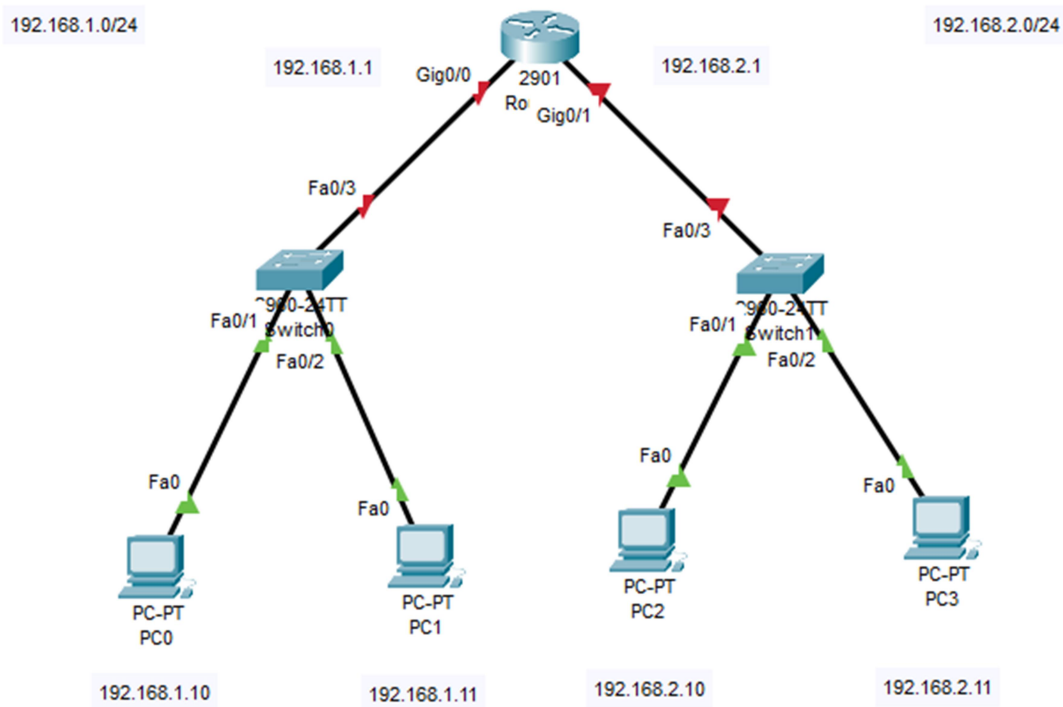
Step-by-Step Procedure:

1. Create the Topology:

- Place one router (e.g., Cisco 2911), two switches, and four PCs (two per LAN).
- Connect each PC to the switch using straight-through cables.
- Connect each switch to one of the router's FastEthernet interfaces.

2. Assign IP Addresses:

- LAN1: 192.168.1.0/24 → PCs: 192.168.1.10, 192.168.1.11
- LAN2: 192.168.2.0/24 → PCs: 192.168.2.10, 192.168.2.11
- Router Interfaces:
 - G0/0: 192.168.1.1
 - G0/1: 192.168.2.1



3. Configure PCs:

- Set IP, subnet mask, and default gateway (router interface IP for that LAN).

4. Configure Router Interfaces:

CLI Command:

```
Router> enable
Router# configure terminal
Router(config)# interface gig0/0
Router(config-if)# ip address 192.168.1.1 255.255.255.0
Router(config-if)# no shutdown
Router(config)# interface gig0/1
Router(config-if)# ip address 192.168.2.1 255.255.255.0
Router(config-if)# no shutdown
Router(config)# end
Router# copy running-config startup-config
```

Config Mode:

Go to: Router0 → Config tab → only configure the Interfaces (Make Port status On)

The screenshot shows the Router0 configuration window with the 'Config' tab selected. On the left, a tree view under 'INTERFACE' shows 'GigabitEthernet0/0' selected. The main panel displays configuration for 'GigabitEthernet0/0'. 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 '0006.2AD3.B601'. Under 'IP Configuration', the 'IPv4 Address' is '192.168.1.1' and the 'Subnet Mask' is '255.255.255.0'. The 'Tx Ring Limit' is set to '10'.

The screenshot shows the Router0 configuration window with the 'Config' tab selected. On the left, a tree view under 'INTERFACE' shows 'GigabitEthernet0/1' selected. The main panel displays configuration for 'GigabitEthernet0/1'. 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 '0006.2AD3.B602'. Under 'IP Configuration', the 'IPv4 Address' is '192.168.2.1' and the 'Subnet Mask' is '255.255.255.0'. The 'Tx Ring Limit' is set to '10'.

5. Verify Connectivity:

- Use the `ping` command between PCs in different LANs (e.g., from 192.168.1.10 to 192.168.2.10).
- Observe successful replies confirming router-enabled inter-network communication.

Two Routers – Static Routing

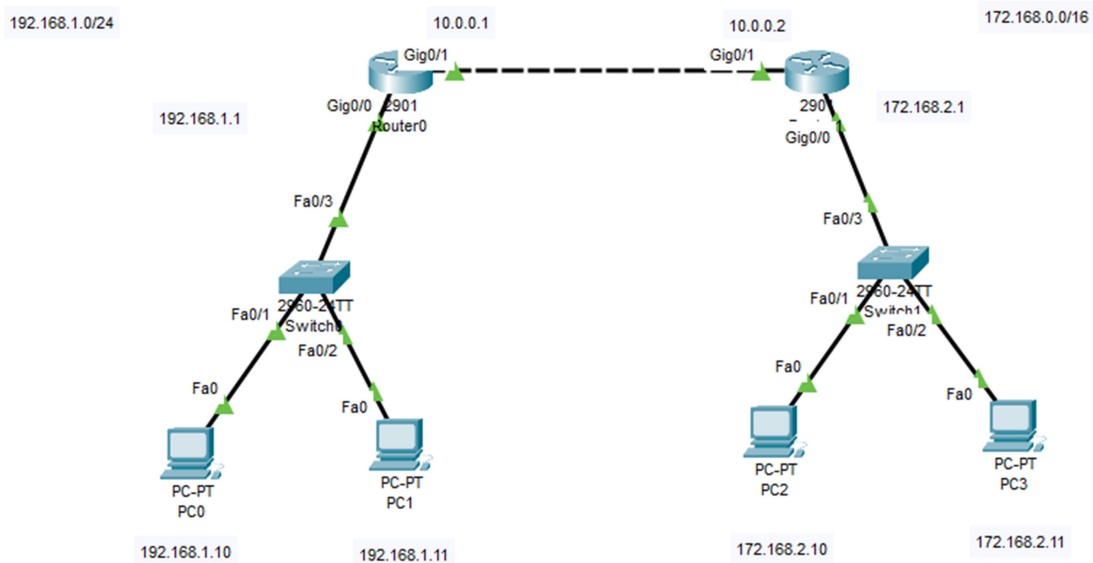
Step-by-Step Procedure:

1. Create the Topology:

- Place two routers (Router0, Router1), each connected to a LAN.
- Connect the routers.
- Connect PCs to switches, and switches to routers.

2. Assign IP Addresses:

- LAN1 (Router0): 192.168.1.0/24
 - PC0: 192.168.1.10 (Gateway: 192.168.1.1)
 - PC1: 192.168.1.11 (Gateway: 192.168.1.1)
- LAN2 (Router1): 172.168.0.0/16
 - PC1: 172.168.2.10 (Gateway: 172.168.2.1)
 - PC2: 172.168.2.11 (Gateway: 172.168.2.1)
- Serial Link:
 - Router0 (Gig0/1): 10.0.0.1/8
 - Router1 (Gig0/1): 10.0.0.2/8



3. Configure Router0:

CLI Commands:

```
Router0> enable
Router0# configure terminal
Router0(config)# interface gig0/0
Router0(config-if)# ip address 192.168.1.1 255.255.255.0
Router0(config-if)# no shutdown
Router0(config)# interface gig0/1
Router0(config-if)# ip address 10.0.0.1 255.0.0.0
Router0(config-if)# no shutdown
Router0(config)# ip route 172.168.0.0 255.255.0.0 10.0.0.2
Router0(config)# end
```

Config Mode:

- Go to Router0→Config tab and configure Interfaces as given below:

The image displays two screenshots of the Router0 configuration interface, showing the configuration for GigabitEthernet0/0 and GigabitEthernet0/1.

Router0 Configuration - GigabitEthernet0/0

- Physical** | **Config** | CLI | Attributes
- GLOBAL**
 - Settings
 - Algorithm Settings
- ROUTING**
 - Static
 - RIP
- SWITCHING**
 - VLAN Database
- INTERFACE**
 - GigabitEthernet0/0
 - GigabitEthernet0/1

GigabitEthernet0/0 Configuration:

- Port Status: ☒ On
- Bandwidth: ☐ 1000 Mbps ☒ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address: 00D0.FF1C.9D01
- IP Configuration
 - IPv4 Address: 192.168.1.1
 - Subnet Mask: 255.255.255.0
- Tx Ring Limit: 10

Router0 Configuration - GigabitEthernet0/1

- Physical** | **Config** | CLI | Attributes
- GLOBAL**
 - Settings
 - Algorithm Settings
- ROUTING**
 - Static
 - RIP
- SWITCHING**
 - VLAN Database
- INTERFACE**
 - GigabitEthernet0/0
 - GigabitEthernet0/1

GigabitEthernet0/1 Configuration:

- Port Status: ☒ On
- Bandwidth: ☒ 1000 Mbps ☐ 100 Mbps ☐ 10 Mbps ☒ Auto
- Duplex: ☐ Half Duplex ☒ Full Duplex ☒ Auto
- MAC Address: 00D0.FF1C.9D02
- IP Configuration
 - IPv4 Address: 10.0.0.1
 - Subnet Mask: 255.0.0.0
- Tx Ring Limit: 10

- Go to Router0 → Config → Routing → Static. Configure the following.

Router0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

Static Routes

Network 172.168.0.0

Mask 255.255.0.0

Next Hop 10.0.0.2

Add

Network Address

Remove

- Then click Add

Router0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

ROUTING

Static

RIP

SWITCHING

VLAN Database

INTERFACE

GigabitEthernet0/0

GigabitEthernet0/1

Static Routes

Network

Mask

Next Hop

Add

Network Address

172.168.0.0/16 via 10.0.0.2

Remove

4. Configure Router1:

CLI Commands:

```
Router1> enable
Router1# configure terminal
Router1(config)# interface gig0/0
Router1(config-if)# ip address 172.168.2.1 255.255.0.0
Router1(config-if)# no shutdown
Router1(config)# interface gig0/1
Router1(config-if)# ip address 10.0.0.2 255.0.0.0
Router1(config-if)# no shutdown
Router1(config)# ip route 192.168.1.0 255.255.255.0 10.0.0.1
Router1(config)# end
```

Config Mode:

- Go to Router1 → Config tab and configure Interfaces as given below:

Router1

Physical Config CLI Attributes

GLOBAL

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

GigabitEthernet0/0

Port Status ☒ On

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

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00D0.FF49.B001

IP Configuration

IPv4 Address 172.168.2.1

Subnet Mask 255.255.0.0

Tx Ring Limit 10

Router1

Physical Config CLI Attributes

GLOBAL

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

GigabitEthernet0/1

Port Status ☒ On

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

Duplex ☐ Half Duplex ☒ Full Duplex ☒ Auto

MAC Address 00D0.FF49.B002

IP Configuration

IPv4 Address 10.0.0.2

Subnet Mask 255.0.0.0

Tx Ring Limit 10

- Go to Router1 → Config → Routing → Static. Configure the following.

Router1

Physical Config CLI Attributes

GLOBAL

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

Static Routes

Network 192.168.1.0

Mask 255.255.255.0

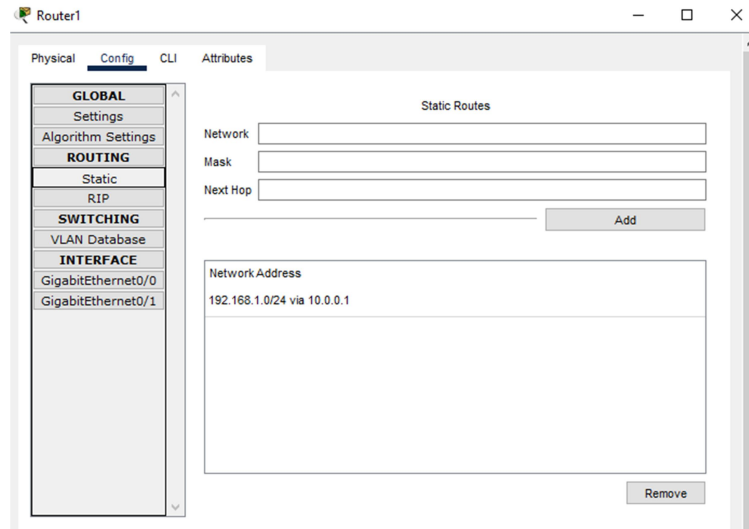
Next Hop 10.0.0.1

Add

Network Address

Remove

- Then click Add



5. Verify Static Routing:

- Ping from PC0 (192.168.1.10) to PC2 (172.168.2.10).
- Check routing table with `show ip route`.
- Observe that packets traverse both routers using static routes.