CNC Lab Experiment-4

Procedure

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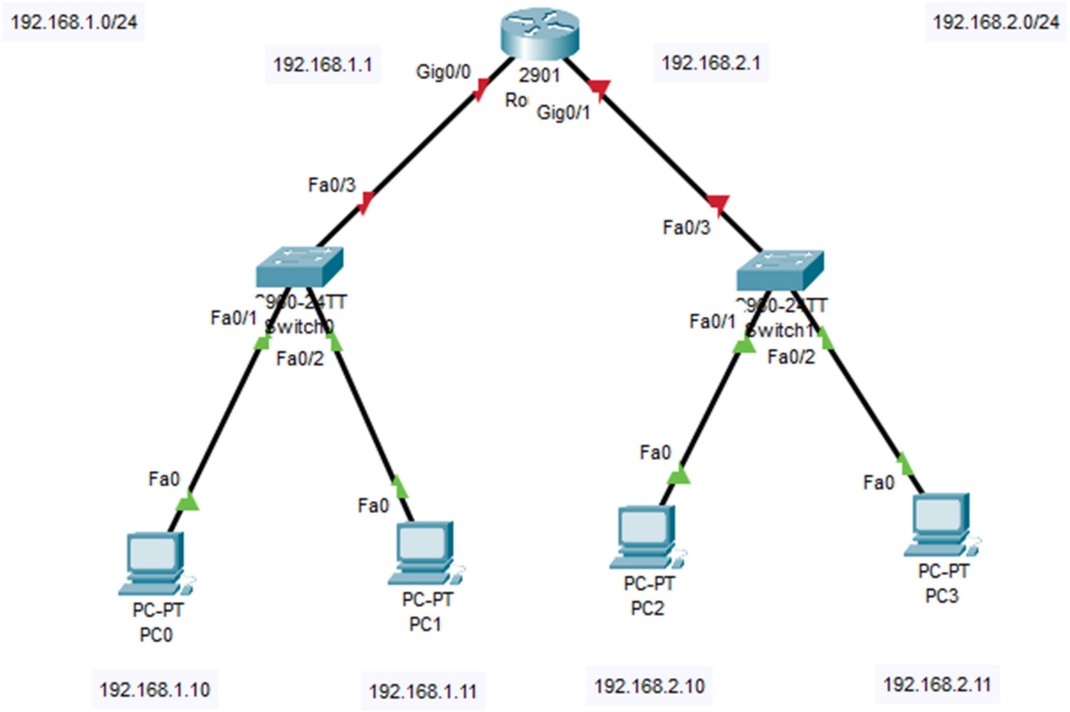
Single Router – Inter-Network Communication

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).

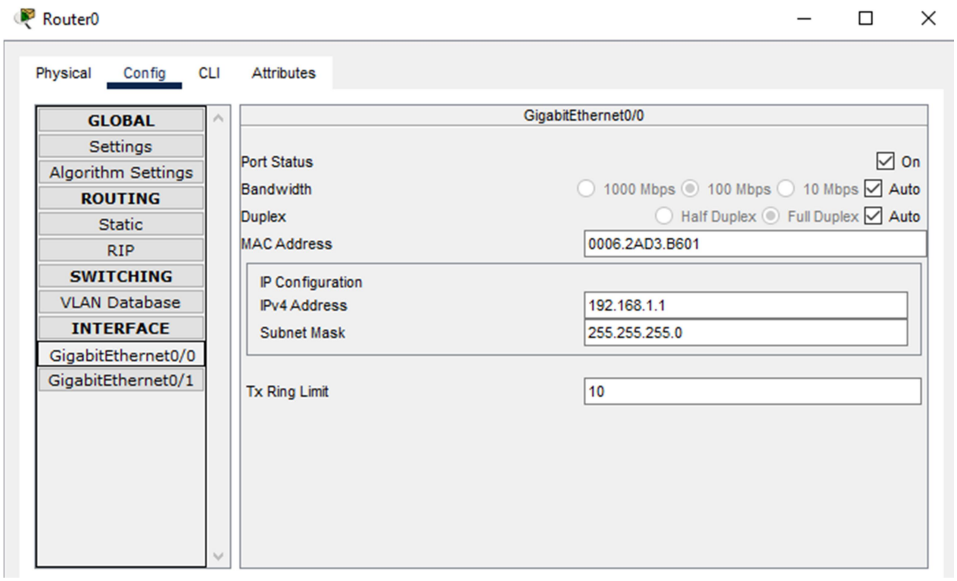
4. **Configure Router Interfaces:**

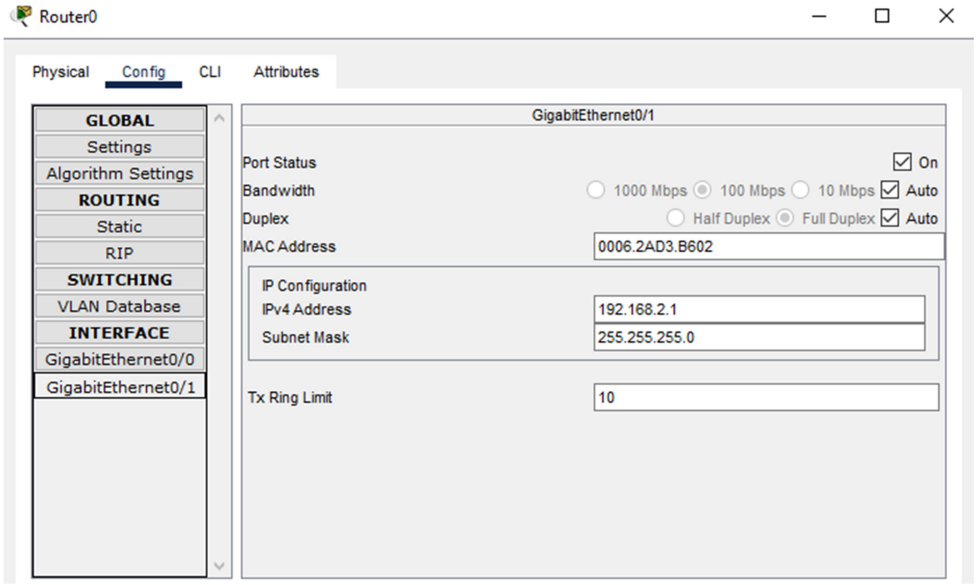
CLI Command:

```
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-configstartup-config
```

Config Mode:

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



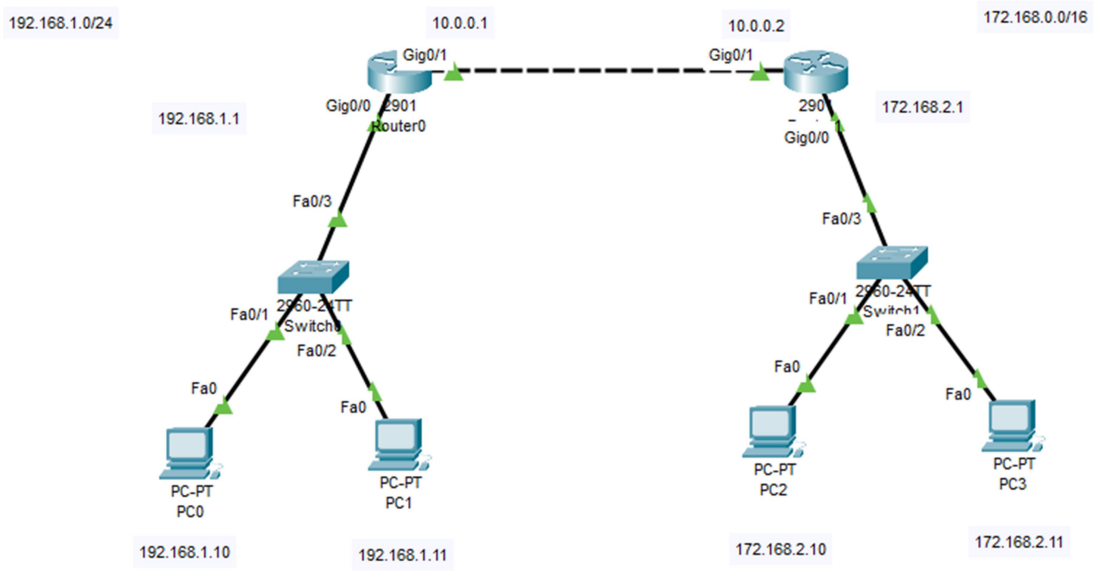


5. **Verify Connectivity:**
    - Use the `ping` command between PCs in different LANs (e.g., from `192.168.1.10` to `192.168.2.10`).
    - Observe successful replies confirming router-enabled inter-network communication.

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`



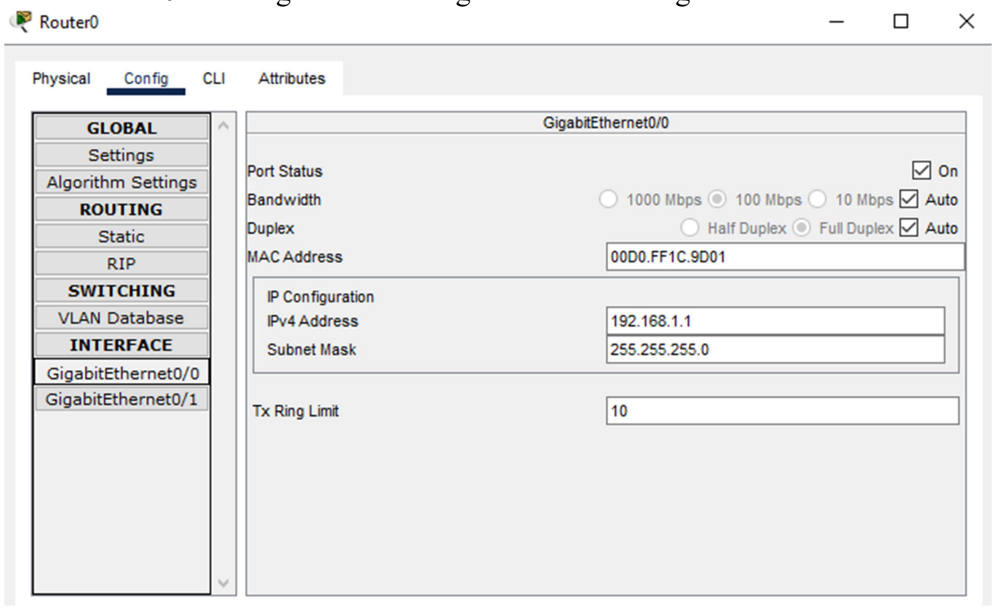
3. **Configure Router0:**

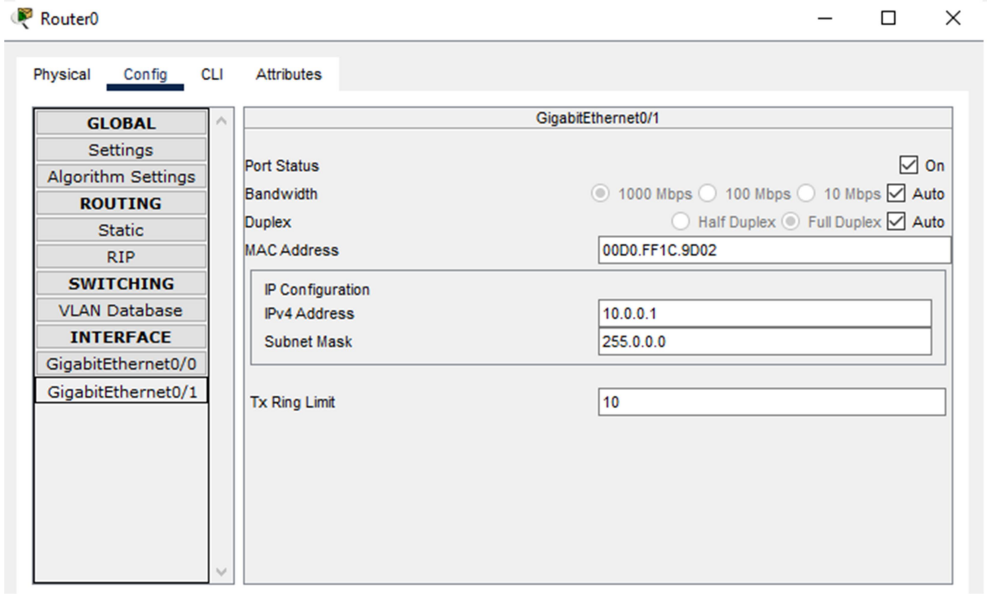
CLI Commands:

```
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
```

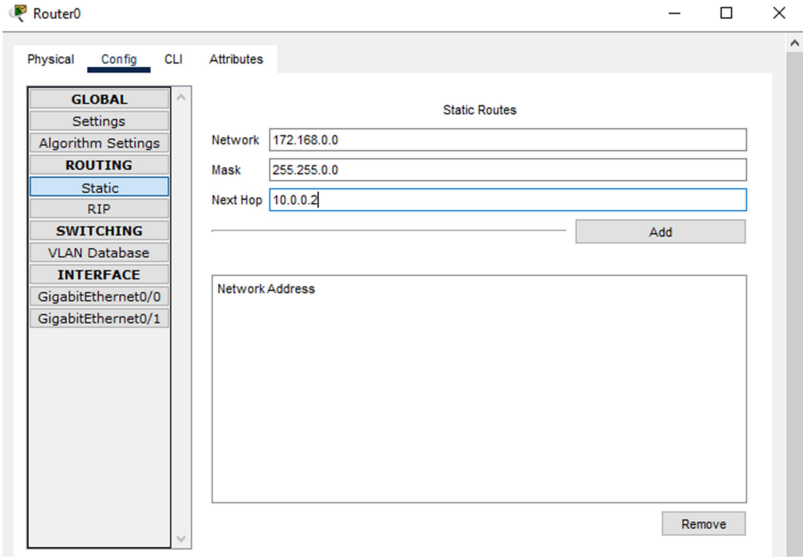
Config Mode:

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

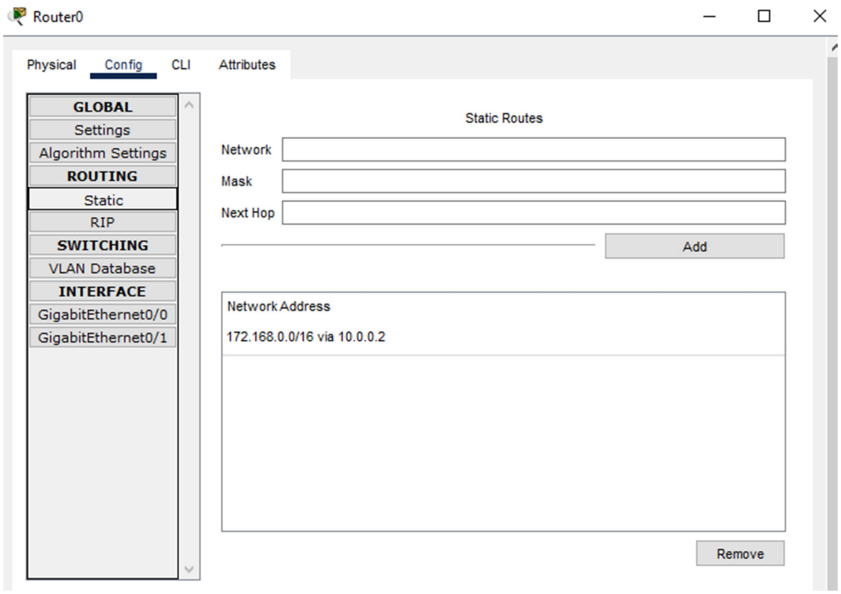




- Go to Router0 → Config → Routing → Static. Configure the following.



- Then click Add



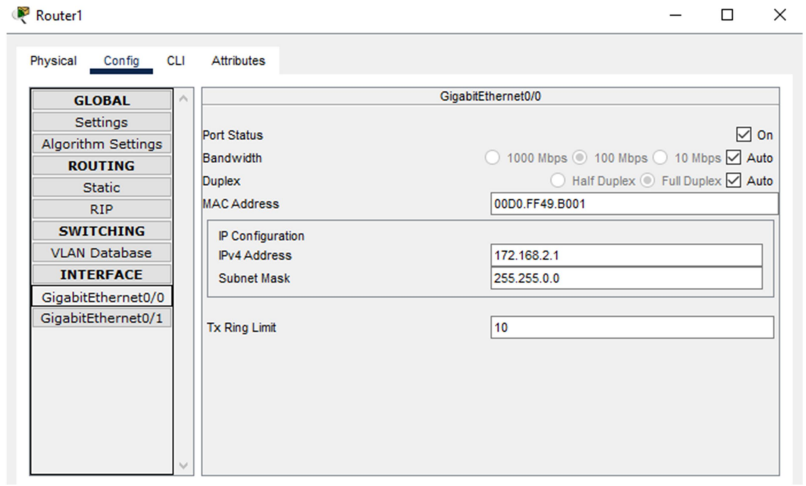
4. **Configure Router1:**

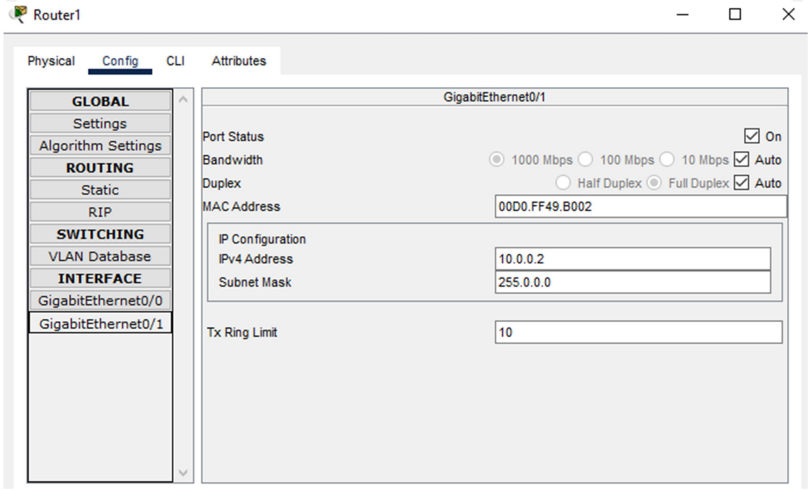
CLI Commands:

```
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
```

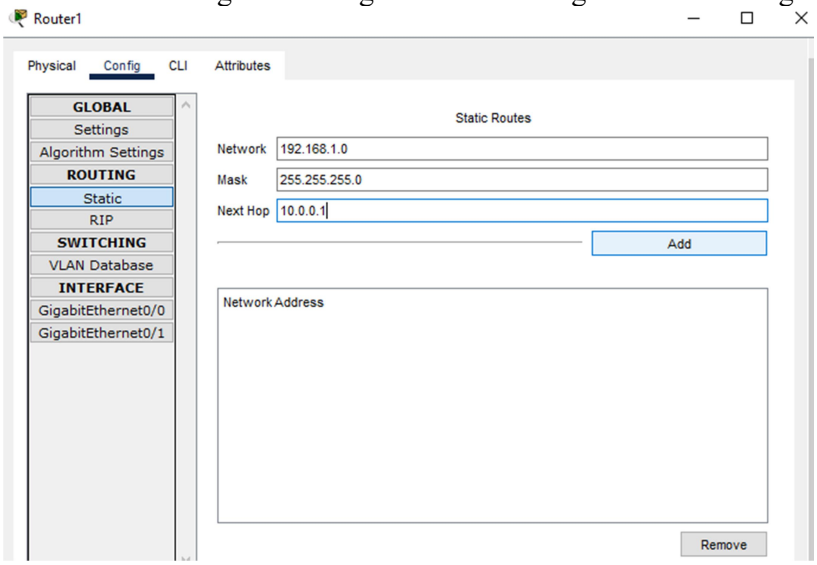
Config Mode:

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

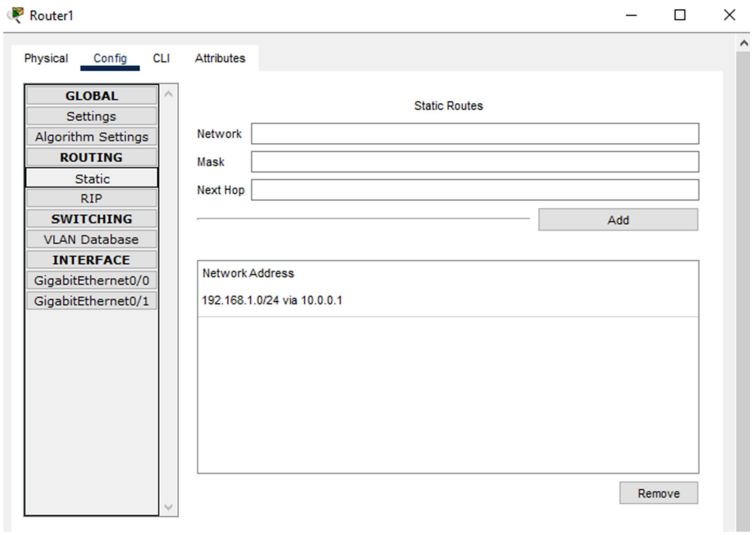




- Go to Router1 → Config → Routing → Static. Configure the following.



- 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.