

DHCP Service-Configuration and implementation in a LAN.

The designed network consists of:

- Network 1: 192.168.20.0/24, Starting IP Address: 192.168.20.10, Connected to Switch 1
- Network 2: 192.168.21.0/24, Starting IP Address: 192.168.21.10, Connected to Switch 2

Step 1: Device Connections

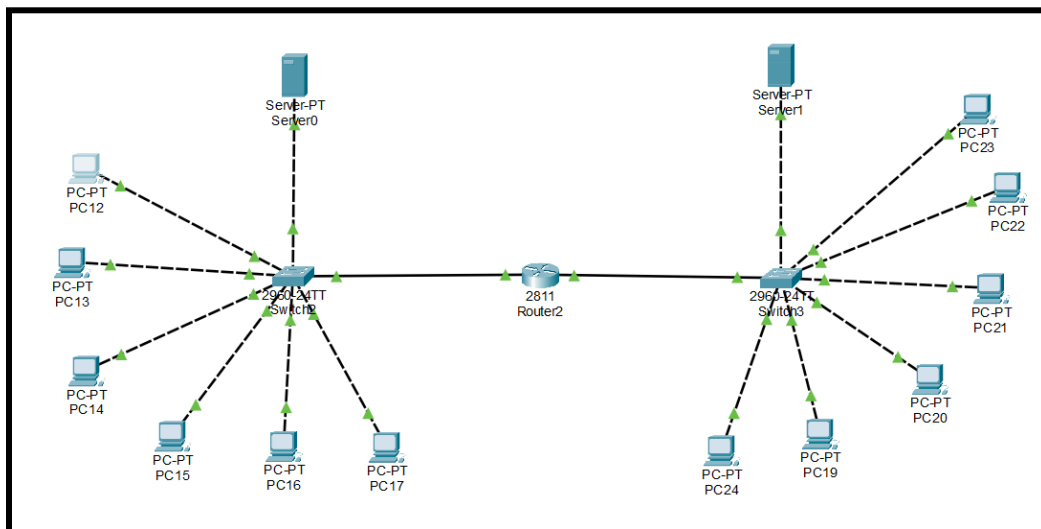
Connect six PCs to Switch 1 (for Network 1)

Connect six PCs to Switch 2 (for Network 2)

Connect Switch 1 to Router FastEthernet0/0.

Connect Switch 2 to Router FastEthernet0/1.

Connect one server to each switch to provide additional network services.



Step 2: Router Configuration

1. Click on the **Router** in Packet Tracer.
2. Navigate to the **Config Tab**.
3. Select **FastEthernet0/0** and assign:
 - IP Address: 192.168.20.1
 - Subnet Mask: 255.255.255.0
4. Select **FastEthernet0/1** and assign:
 - IP Address: 192.168.21.1
 - Subnet Mask: 255.255.255.0

Step 3: Configure DHCP on the Router via GUI

1. Click on the **Router** and navigate to the **Services** tab.
2. Select **DHCP**.
3. Click **On** to enable the DHCP service.
4. Configure a new pool for **Network 1**:
 - Default Gateway: 192.168.20.1
 - Subnet: 255.255.255.0
 - Start IP: 192.168.20.10
5. Configure a new pool for **Network 2**:
 - Default Gateway: 192.168.21.1
 - Subnet: 255.255.255.0
 - Start IP: 192.168.21.10
6. Save the configuration.

Physical

Config

Services

Desktop

Programming

Attributes

SERVICES

HTTP

DHCP

DHCPv6

TFTP

DNS

SYSLOG

AAA

NTP

EMAIL

FTP

IoT

VM Management

Radius EAP

DHCP

InterfaceFastEthernet0ServiceOnOff

Pool NameserverPool

Default Gateway192.168.20.1

DNS Server0.0.0.0

Start IP Address :1921682010

Subnet Mask:2552552550

Maximum Number of Users :246

TFTP Server:0.0.0.0

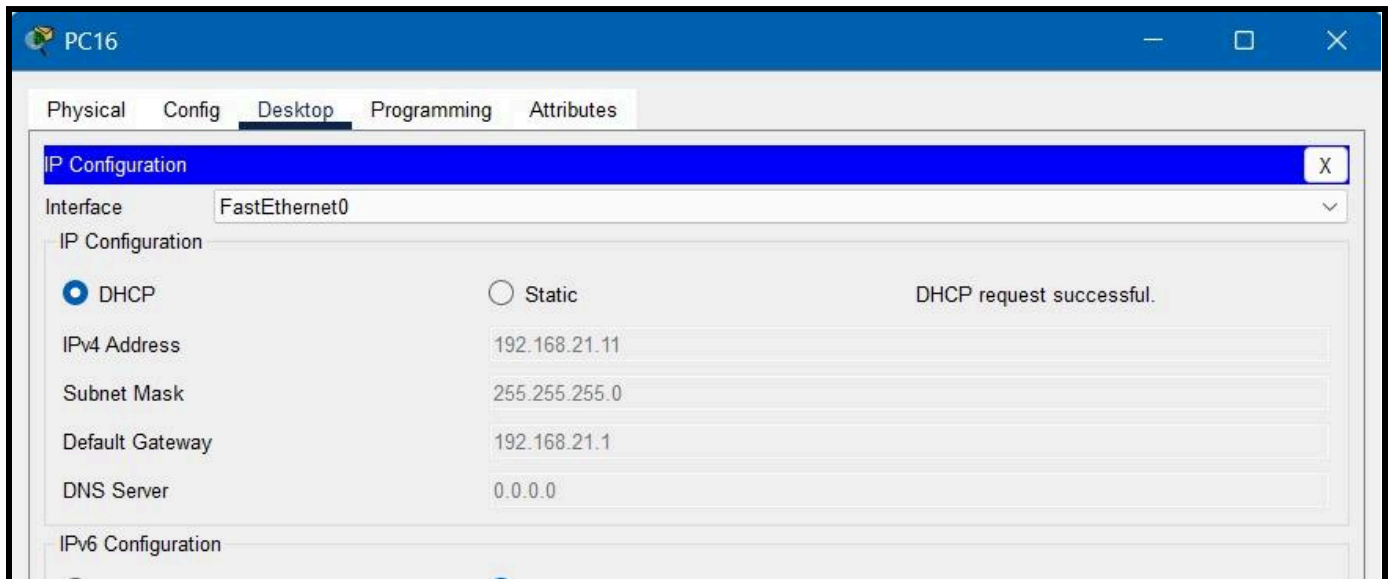
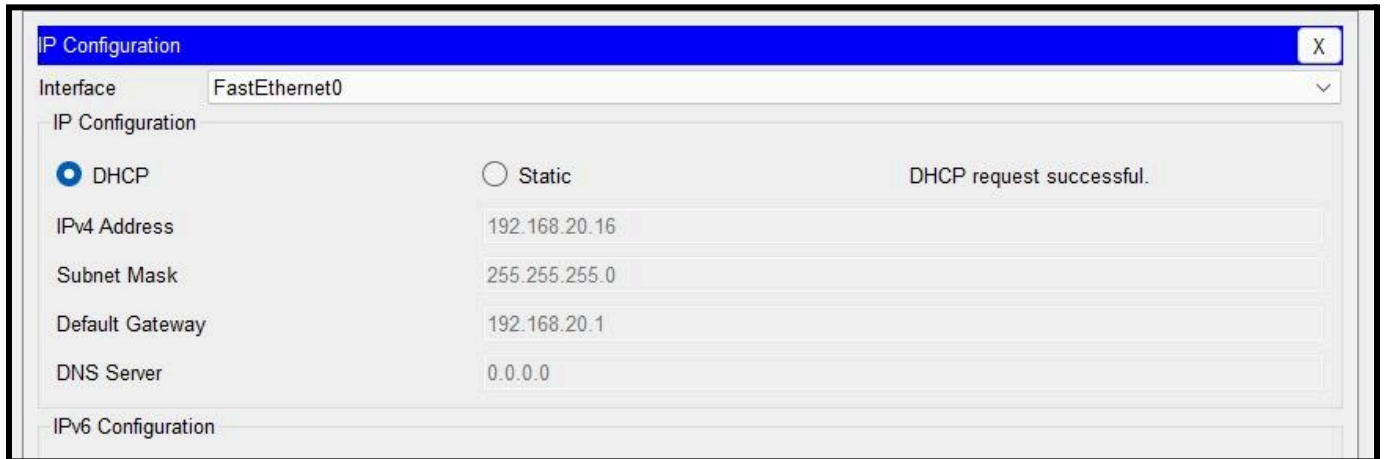
WLC Address:0.0.0.0

AddSaveRemove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server	WLC Address
serverPool	192.168.20.1	0.0.0.0	192.168.2...	255.255.2...	246	0.0.0.0	0.0.0.0

Step 4: Configure PCs to Obtain IP Automatically

1. Click on each **PC**.
2. Go to the **Desktop Tab > IP Configuration**.
3. Select **DHCP**.
4. The PC should obtain an IP address within the assigned range



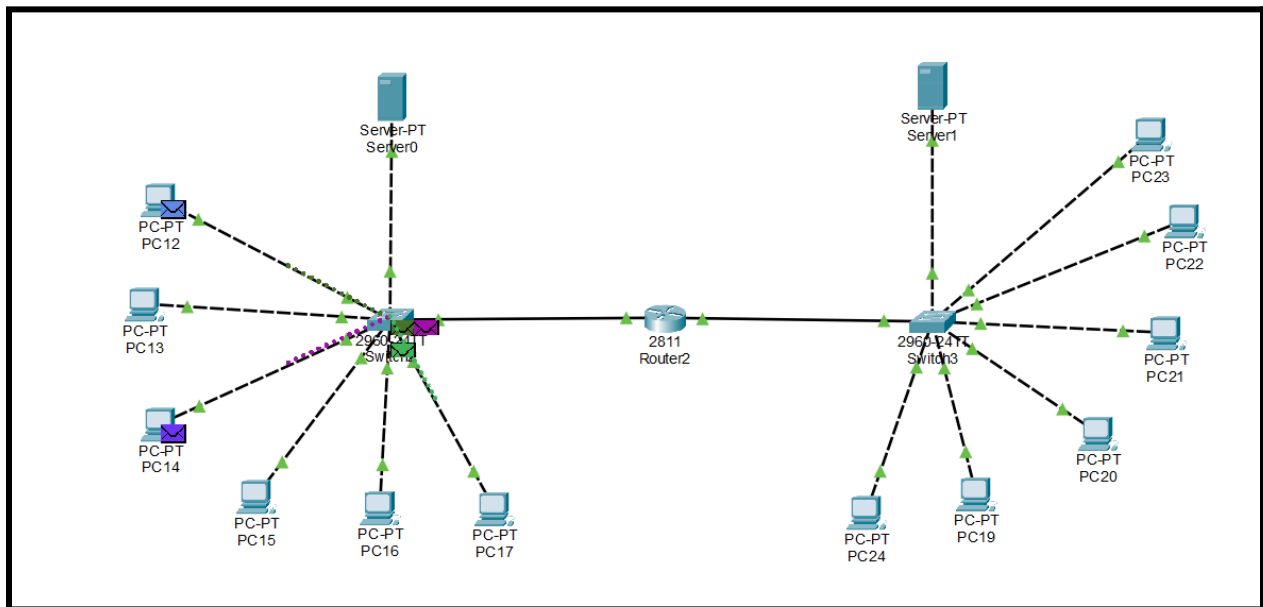
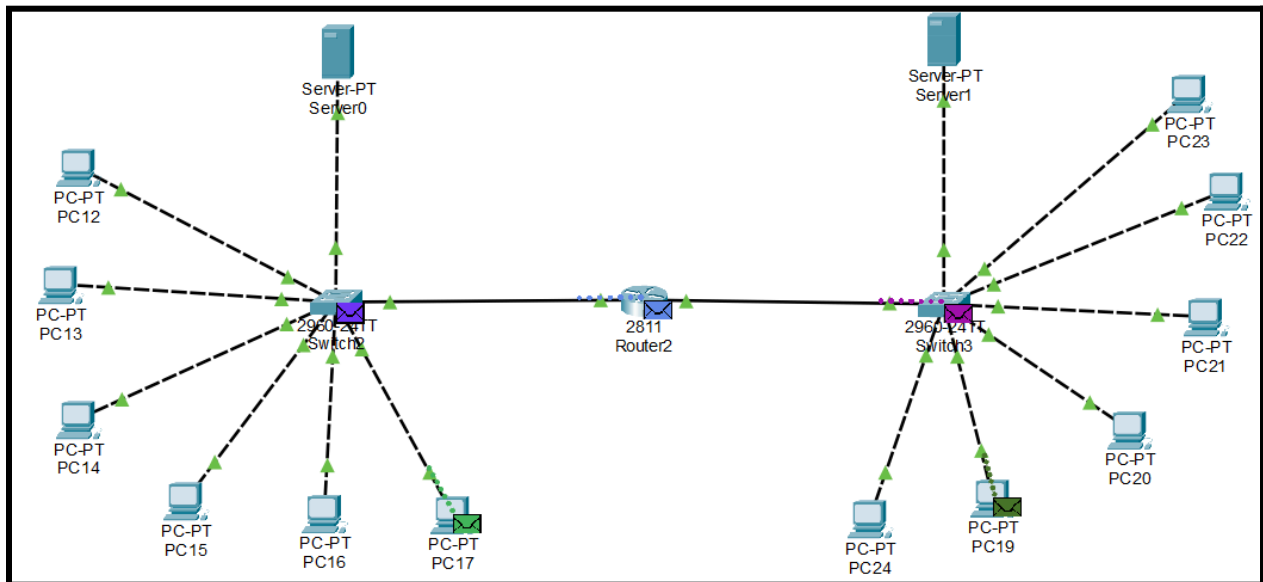
Step 5: Test Connectivity

Same Network Communication Test

1. Open **Command Prompt** on PC1 (192.168.20.10).
2. Ping PC2 (192.168.20.11):
ping 192.168.20.11
3. Similarly, test between other PCs in the same network.

Inter-Network Communication Test







1. Open **Command Prompt** on PC1 (192.168.20.10).
2. Ping PC7 (192.168.21.10): ping 192.168.21.10
3. If successful, communication between networks is established.



1. **Successful Ping Tests Between Network Devices**
 - This screenshot shows the results of ICMP (ping) tests verifying successful communication between devices in different networks.
2. **Inter-Network Connectivity Validation**
 - The results confirm that devices in separate LANs can communicate successfully using the configured router.

3. ICMP Packet Transmission Results

- The table displays successful pings between devices in Network 1 and Network 2, confirming proper routing and DHCP configuration.

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
	Successful	PC14	PC23	ICMP		0.000	N	2	(edit)	(delete)
	Successful	PC14	PC23	ICMP		0.000	N	3	(edit)	(delete)
	Successful	PC17	PC12	ICMP		0.000	N	4	(edit)	(delete)

Conclusion

The network has been successfully designed and configured in Cisco Packet Tracer using GUI-based setup. The DHCP server dynamically assigns IP addresses, and devices can communicate within and across networks. The network structure is efficient and scalable for further enhancements.