LAB 8 : Server Configuration – DHCP, DNS and Web Server in Cisco Packet Tracer

OBJECTIVES :

- To configure a server to provide DHCP, DNS, and Web (HTTP) services in Cisco Packet Tracer
- To understand how DHCP assigns IP addresses and how DNS resolves domain names
- To verify the proper functioning of server services by accessing a web server from client devices

THEORY :

1) **Server Configuration :**
   Server configuration involves setting up a dedicated device to provide network services to client systems. Servers are generally assigned a static IP address to ensure reliable access. In this lab, a single server is configured to provide DHCP, DNS, and HTTP services. Proper server configuration enables centralized control, efficient communication, and simplified network management.

2) **DHCP (Dynamic Host Configuration Protocol) :**
   DHCP is a network protocol that automatically assigns IP addresses and other network parameters such as subnet mask, default gateway, and DNS server to client devices. This eliminates the need for manual IP configuration, reduces errors, and improves scalability. In this lab, the server distributes IP addresses dynamically to connected PCs.

3) **DNS (Domain Name System) :**
   DNS translates human-readable domain names into IP addresses. Instead of remembering numerical IP addresses, users can access services using domain names such as www.hcoe.com. The DNS server stores records that map domain names to IP addresses and responds to client queries accordingly.

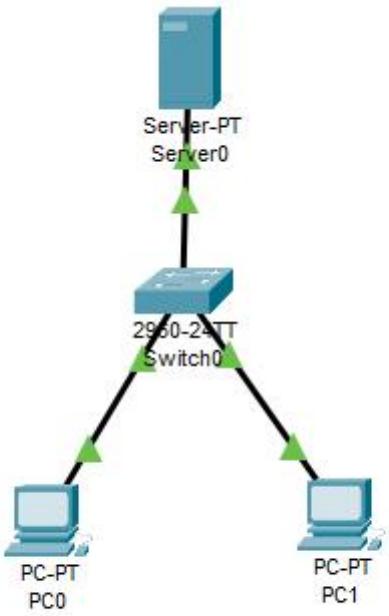
4) **Web Server (HTTP Service) :**

A web server hosts web content and delivers it to clients using the HTTP protocol. It responds to browser requests and serves files such as HTML pages. In this lab, the HTTP service is enabled on the server, allowing clients to access a webpage through a browser.

Integration of DHCP, DNS, and Web Server :

These services work together to provide seamless networking. DHCP assigns IP addresses, DNS resolves domain names, and the web server delivers content. Their integration demonstrates how centralized services simplify network configuration and improve usability.

Network Topology :



Configuration :

IP Addressing Scheme

Device	IP Address	Subnet Mask	Gateway
Server	192.168.1.2	255.255.255.0	192.168.1.1
PC	DHCP	DHCP	DHCP

For PCs,

Device	IPv4 Address	Subnet Mask	Default Gateway	DNS Server
PC0	192.168.1.1	255.255.255.0	0.0.0.0	192.168.1.2
PC1	192.168.1.3	255.255.255.0	0.0.0.0	192.168.1.2

For Server,

Device	Default Gateway	DNS Server
Server0	192.168.1.1	192.168.1.2

Procedure :

Server Configuration :

Step 1 : Assign Static IP to Server

1. Click on Server
2. Go to Desktop → IP Configuration
3. Configure the following:

    - IP Address: 192.168.1.2
    - Subnet Mask: 255.255.255.0
    - Default Gateway: 192.168.1.1
    - DNS Server: 192.168.1.2

DHCP Configuration :

Step 2 : Enable DHCP Service

1. Go to Server → Services → DHCP
2. Turn DHCP: ON

Step 3 : Create DHCP Pool

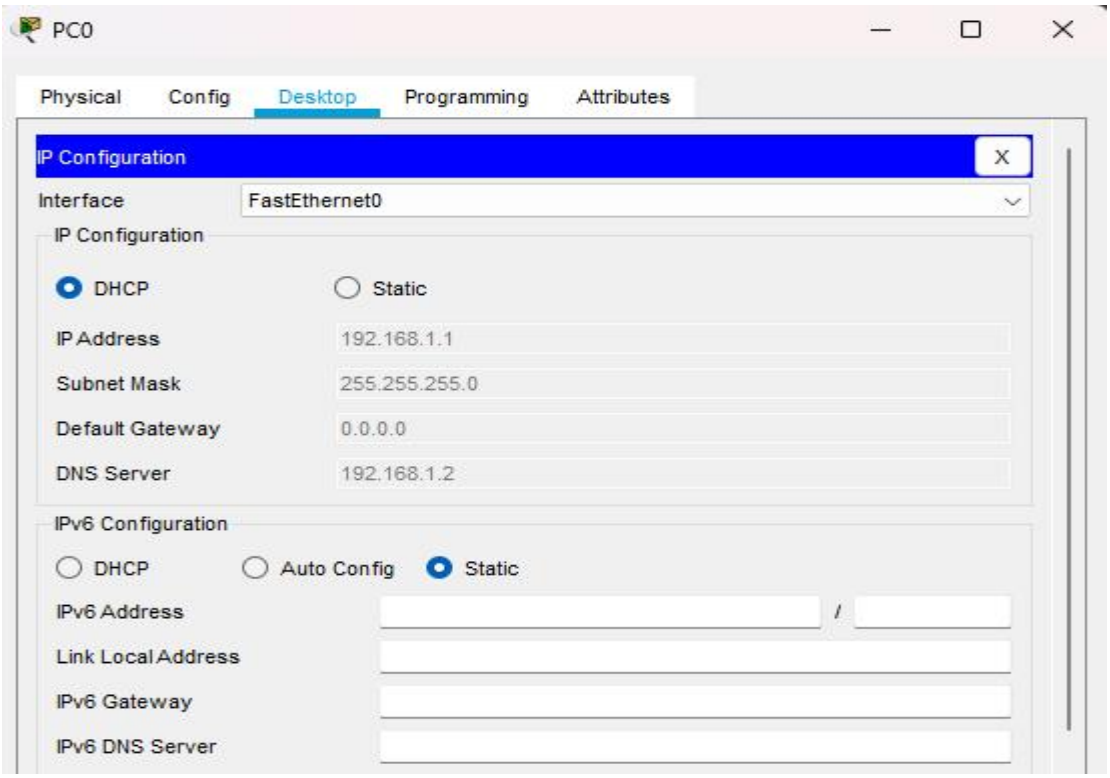
Field	Value
Pool Name	LAB_POOL
Default Gateway	192.168.1.1
DNS Server	192.168.1.2
Start IP Address	192.168.1.10
Subnet Mask	255.255.255.0
Maximum Users	50

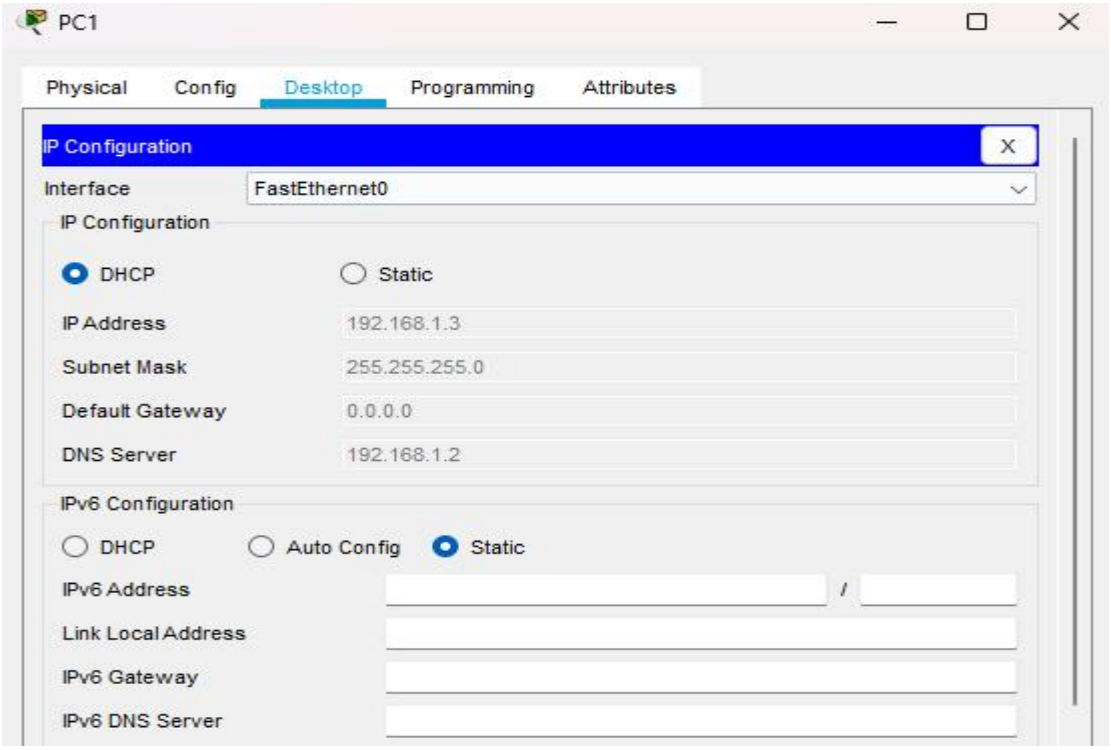
Click Add

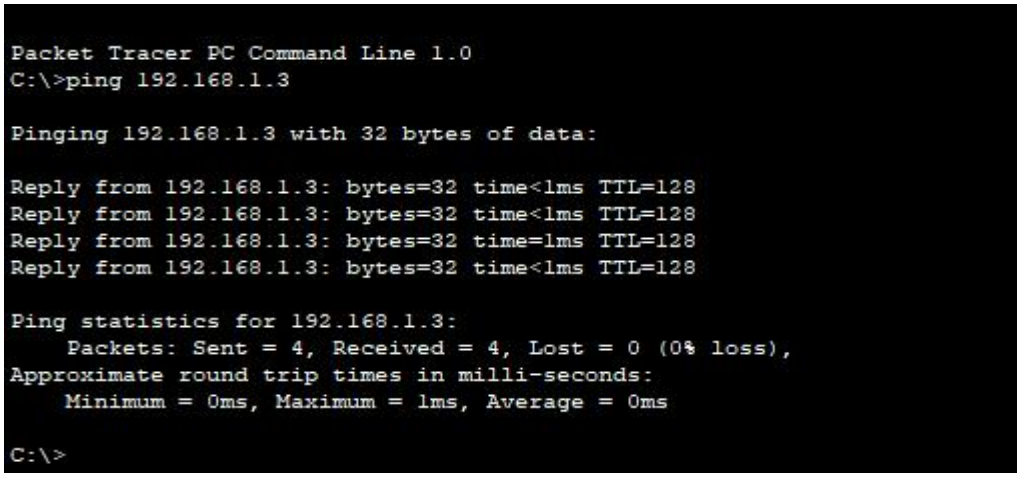
Verification :

On each PC:

- Go to Desktop → IP Configuration
- Select DHCP







DNS Server Configuration :

Step 4 : Enable DNS Service

1. Go to Server → Services → DNS
2. Turn DNS: ON

Step 5 : Add DNS Records

- Name: www.hcoe.com
- Type: A record
- Address: 192.168.1.2

Click Add

Verification :
On each PC:

- Open Command Prompt
- Ping: www.hcoe.com

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C:\>ping www.hcoe.com

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

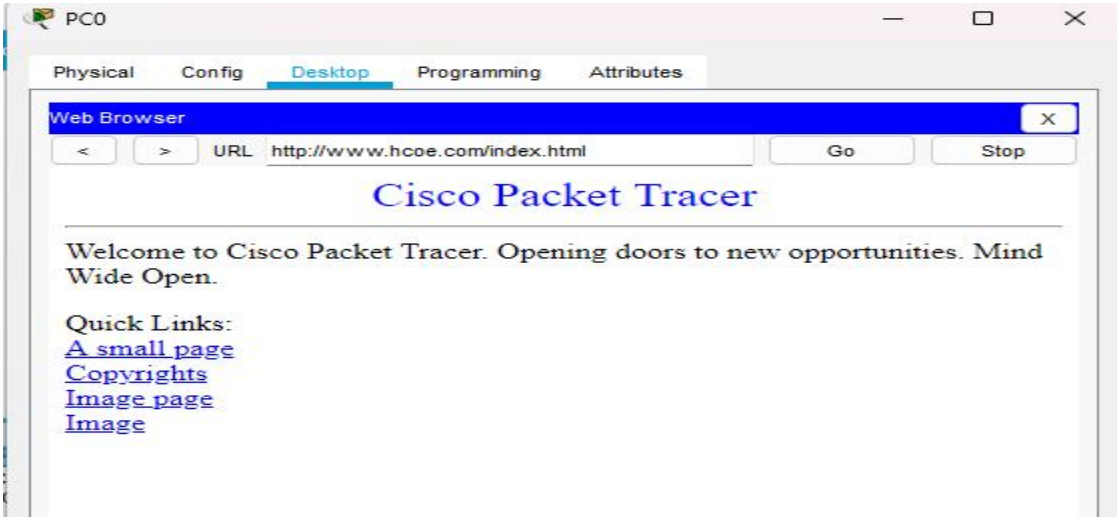
Web Server Configuration :

Step 6 : Enable HTTP Service

1. Go to Server → Services → HTTP
2. Turn HTTP: ON
3. Edit index.html (optional)

Verification :
On PC:

- Go to Desktop → Browser
- Type: http://www.hcoe.com



RESULT :

The DHCP, DNS, and Web Server services were successfully configured on the server. Client PCs automatically received valid IP configurations through DHCP. DNS correctly resolved the domain name to the server's IP address, and the web page was accessed successfully via HTTP, confirming proper operation of all services.

DISCUSSION :

This lab demonstrated the practical implementation of essential network services and their interdependency. DHCP simplified IP management, DNS enabled user-friendly access to resources, and the web server validated application-layer communication. The experiment enhanced understanding of centralized service management and basic troubleshooting in a simulated network environment.

CONCLUSION :

The objectives of configuring DHCP, DNS, and HTTP services in Cisco Packet Tracer were successfully achieved. The lab verified correct IP assignment, domain name resolution, and web server accessibility, demonstrating the importance of integrated server-based services in modern networks.