LAB 8 — Server Configuration (DHCP, DNS & Web Server)

➢ Objectives:

1. To automatically assign IP addresses using DHCP server.
2. To configure DNS and access website using domain name.

➢ Software Requirement:

- Cisco Packet Tracer (any recent version)
- Windows/Linux PC

➢ Theory:

DHCP (Dynamic Host Configuration Protocol):

DHCP automatically assigns IP addresses and other network settings to devices in a network. When a device connects, it requests an IP address from the DHCP server. The server provides an IP address, subnet mask, default gateway, and DNS address. This reduces manual configuration and prevents IP address conflicts.
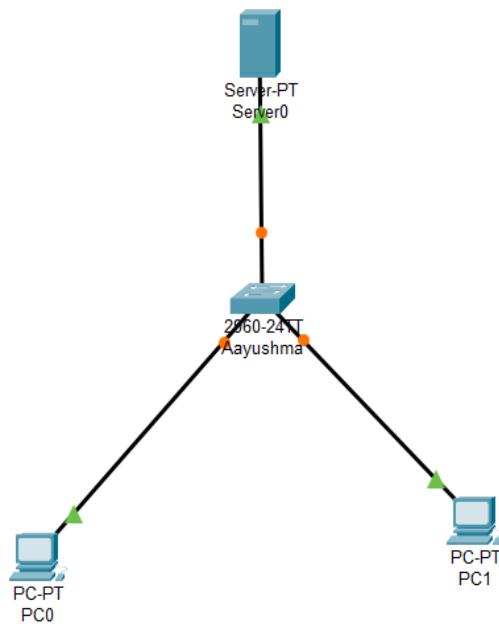
DNS (Domain Name System):

DNS translates domain names into IP addresses. Instead of remembering numerical IP addresses, users can enter a website name like www.example.com. The DNS server converts that name into the correct IP address. This makes accessing websites easier and more user-friendly.

HTTP Web Service:

HTTP (Hyper Text Transfer Protocol) is used to transfer web pages between a server and a client browser. The HTTP service allows the server to host and deliver website content. When a user enters a website address, the browser sends an HTTP request to the server. The server then responds by sending the requested web page.

➢ **Network Topology:**

IP Addressing Scheme

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

PC DHCP Configuration

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

Server Network Settings

Device	Default Gateway	DNS Server
Server0	192.168.1.1	192.168.1.2

Steps:

1.Server Static IP Configuration:

Steps: Assign a static IP to the server

1. Click **Server**
2. Go to **Desktop → IP Configuration**
3. Configure:

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

2. DHCP Configuration:

Step 2: Enable DHCP Service

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

Step 3: Create DHCP Pool

Fill the following fields:

Field	Value
Pool Name	LAN_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	0
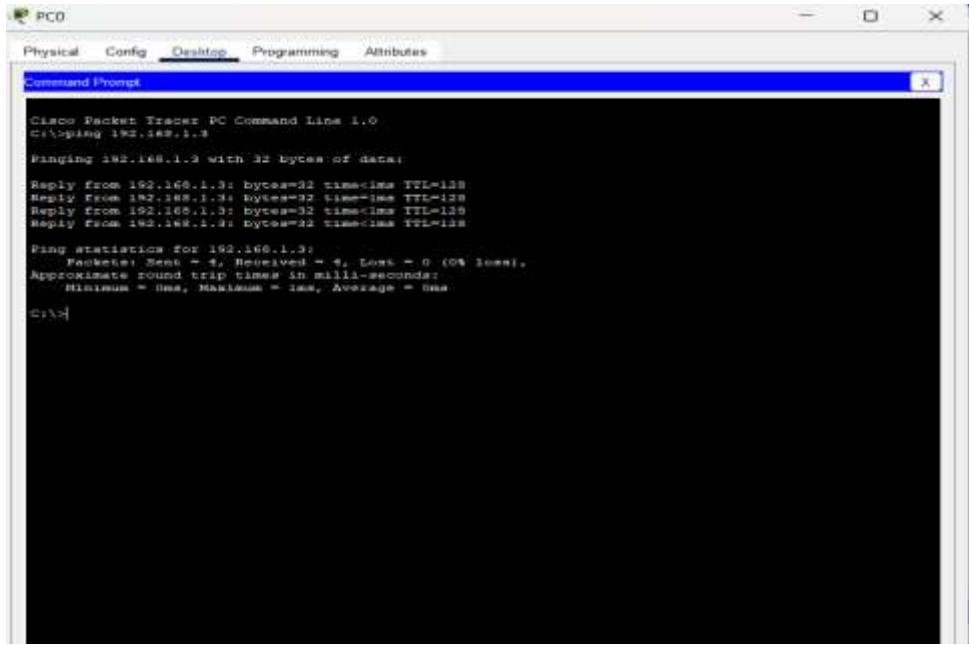
Click **Add**

DHCP Verification

On each PC:

- Desktop → IP Configuration → Select DHCP
- Test using ping

3.DNS Server Configuration

Steps4: Enable DNS Service

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

Step 5: Add DNS Record

Name: www.kbc.com
Type: A record
Address: 192.168.1.2

Click **Add**

DNS Verification

On each PC:

- Open Command Prompt
- ping www.hcoe.com

```
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 = 0ms, Average = 0ms

C:\>
```
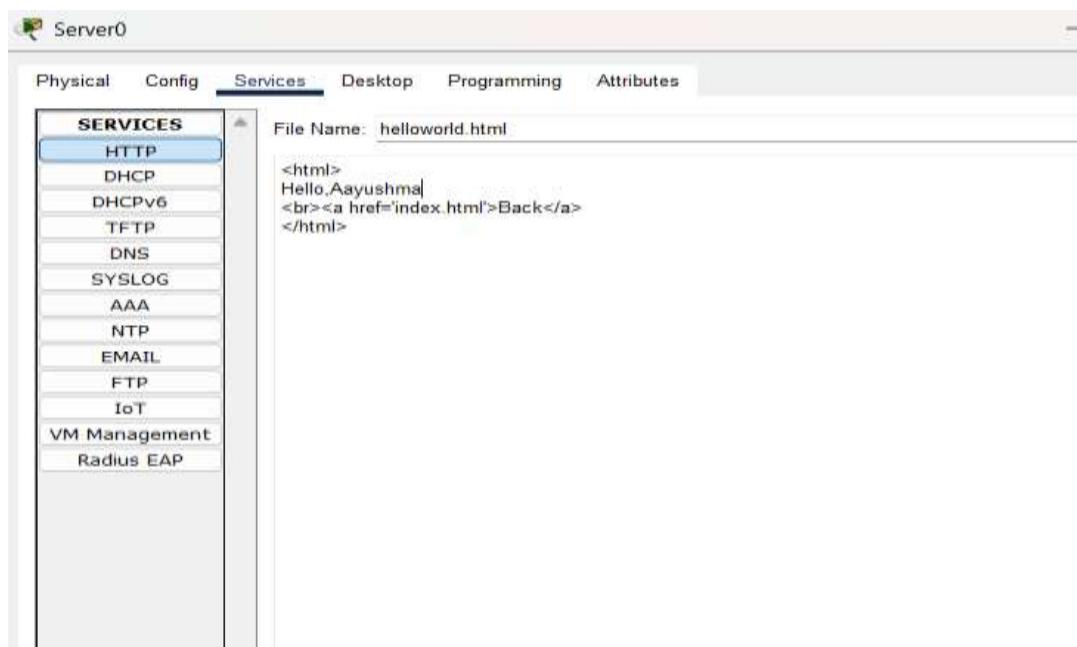
4.Web Server Configuration

Step6: Enable HTTP Service

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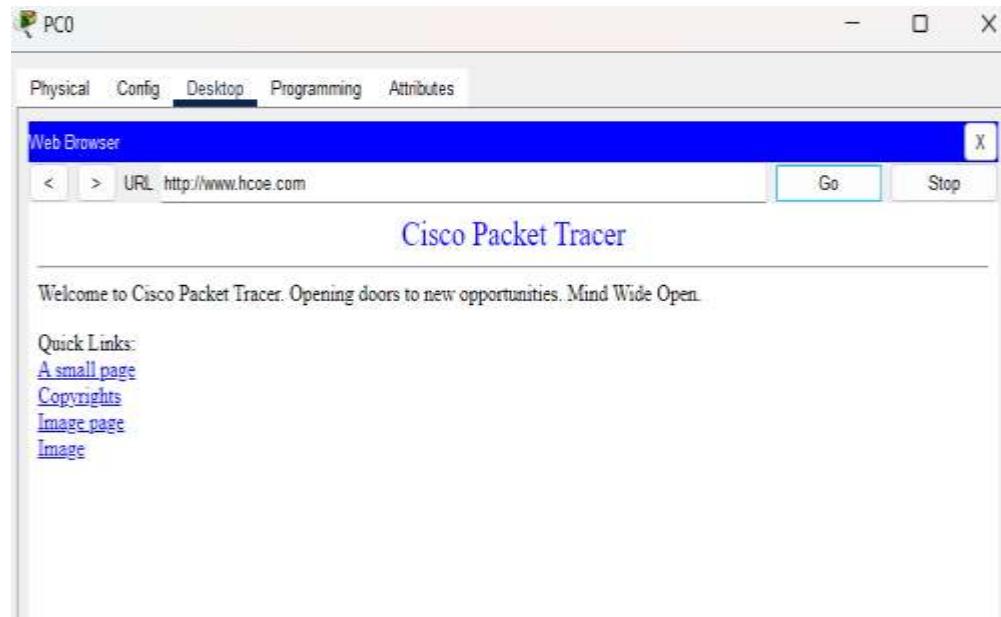
Edit index.html(Optional)

Verification

On PC:

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

➢ **Result:**

First, we configured the server with a static IP address and enabled DHCP service. Next, we observed that PCs automatically received IP addresses from the DHCP pool. After that, we configured DNS and accessed the website using a domain name successfully. Finally, we verified the setup by pinging and opening the web page in the browser.

➢ **Discussion:**

Initially, we manually configured the server to act as a centralized network service provider. Then, we enabled DHCP and noticed that it reduced manual IP configuration work. Moreover, we configured DNS which translated domain names into IP addresses. Afterwards, we enabled the web service so users could access information through a browser. In addition, we verified connectivity using both ping and browser testing. Therefore, we realized that servers make networks easier to manage and more user friendly.

➢ **Conclusion:**

In conclusion, we learned how automatic IP allocation works using DHCP. Furthermore, we understood the role of DNS in converting human readable names into machine readable addresses. Additionally, we successfully hosted a website on a local server. Then, we tested connectivity and confirmed proper functioning of all services. Overall, we gained practical knowledge of centralized network services.