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

Objectives

1. To understand the working mechanism of Dynamic Host Configuration Protocol (DHCP) for automatic IP address assignment.

2. To configure a Domain Name System (DNS) server to translate domain names into IP addresses.

3. To set up and configure a Web Server (HTTP) to host a website and access it through client PCs using a web browser.

Theory

1. DHCP (Dynamic Host Configuration Protocol)

DHCP is a network management protocol used on UDP/IP networks.

Operation: It automatically assigns an IP address and other related configuration information (such as subnet mask and default gateway) to each device on a network. This eliminates the need to manually configure IP addresses for every device.

Application: Used in enterprise and home networks to manage IP allocation efficiently and prevent IP conflicts.

2. DNS (Domain Name System)

DNS is a hierarchical and decentralized naming system for computers, services, or other resources connected to the Internet or a private network.

Operation: It translates human-readable domain names (e.g., www.hcoe.com) into numerical IP addresses (e.g., 192.168.1.2) that computers use to locate each other.
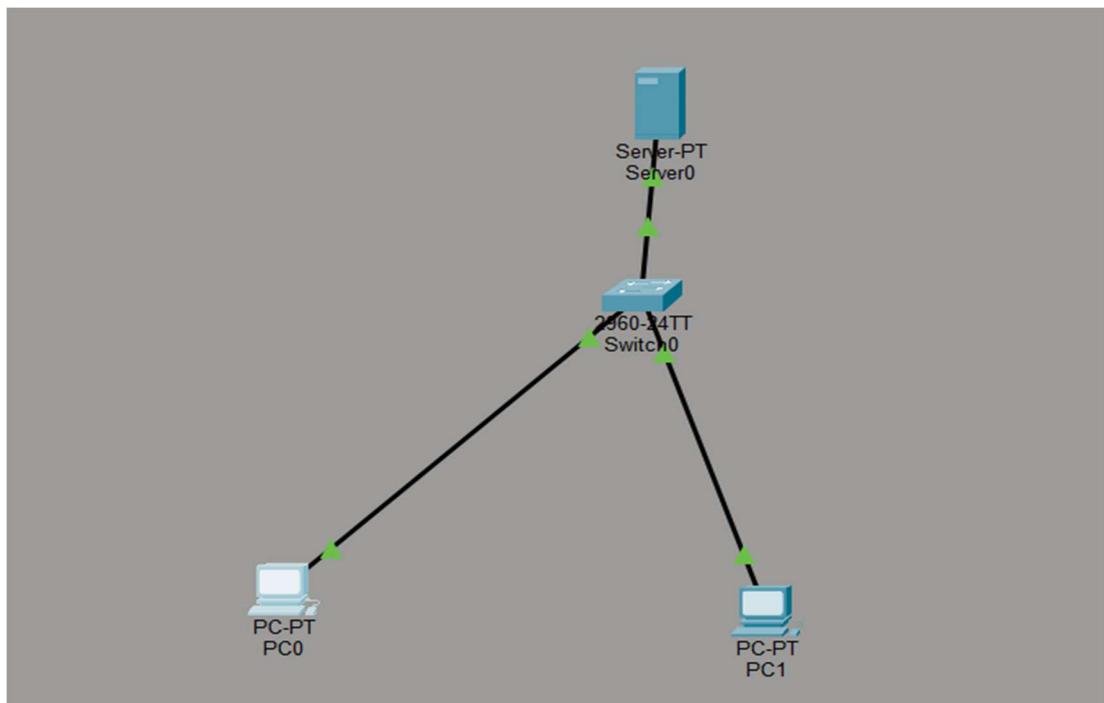
3. Web Server (HTTP)

A Web Server stores and delivers content to a web browser.

Operation: It uses the Hypertext Transfer Protocol (HTTP) to respond to client requests. When a user types a URL, the browser requests the page from the server, which sends back HTML files to display the content.

Network Topology

A topology was created using one Server (Server-PT named "Server0") connected to a Switch (2960-24TT named "Switch0").The Switch connects two client devices, PC0 and PC1. The Server acts as a multi-functional device providing DHCP, DNS, and Web services to the network.

IP addressing scheme

IP Configuration Table

Device	Interface	IP Address	Subnet Mask	Default Gateway	DNS Server	Allocation Method
Server0	FastEthernet0	192.168.1.2	255.255.255.0	0.0.0.0	127.0.0.1	Static
PC0	FastEthernet0	192.168.1.3	255.255.255.0	0.0.0.0	192.168.1.2	DHCP
PC1	FastEthernet0	192.168.1.4	255.255.255.0	0.0.0.0	192.168.1.2	DHCP

Configuration:

Server Configuration

The Server0 was assigned a static IP address to ensure it remains reachable by clients.

- IP Address: 192.168.1.2

- Subnet Mask: 255.255.255.0

DHCP Configuration

The DHCP service was enabled on Server0 to provide dynamic IPs to PC0 and PC1.

- Service: On

- Pool Name: LAN_POOL

- Default Gateway: 192.168.1.1

- DNS Server: 192.168.1.2

- Start IP Address: 192.168.1.10

- Maximum number of Users: 50

Web Server and DNS Configuration

1. HTTP Service: The HTTP and HTTPS services were enabled on Server0. The `index.html` file was edited to display "Welcome From Kritesh."

2. DNS Service: The DNS service was enabled. A record was added to map the domain name to the server's IP.

Name: www.hcoe.com
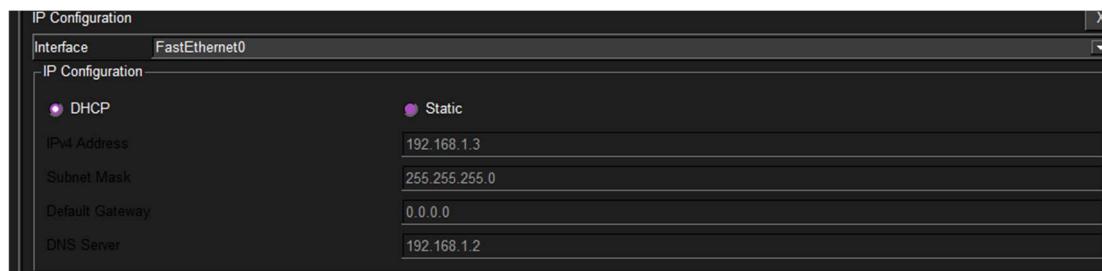
Type: A Record

Address: 192.168.1.2

Verifications for all configurations
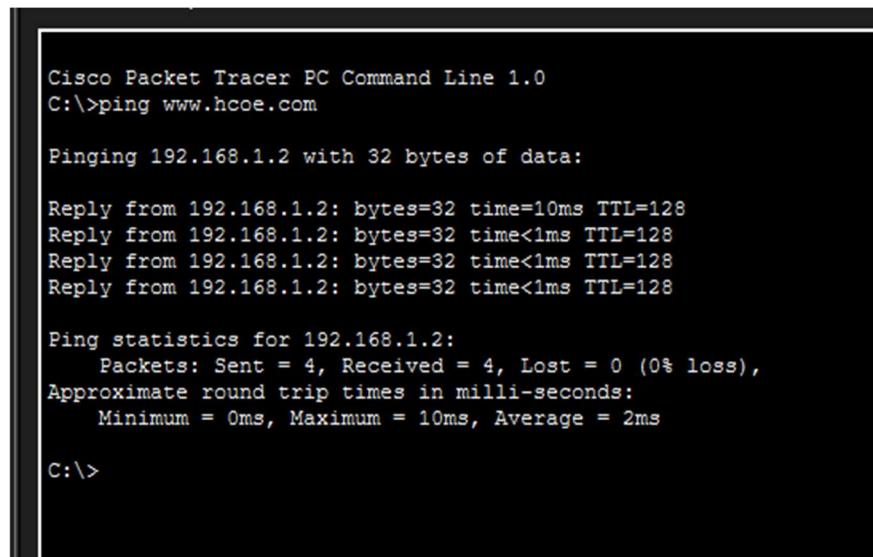
1. DHCP Verification:

We accessed PC0 and set the IP configuration to "DHCP". The request was successful, and the IP 192.168.1.3 was automatically assigned along with the DNS server IP.

2. DNS and Connectivity Verification:

To verify DNS, a ping command was issued from PC0 to the domain name `www.hcoe.com`. The DNS server successfully resolved the name to the IP address 192.168.1.2, and replies were received.


```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping www.hcoe.com

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=10ms 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 = 10ms, Average = 2ms

C:\>
```
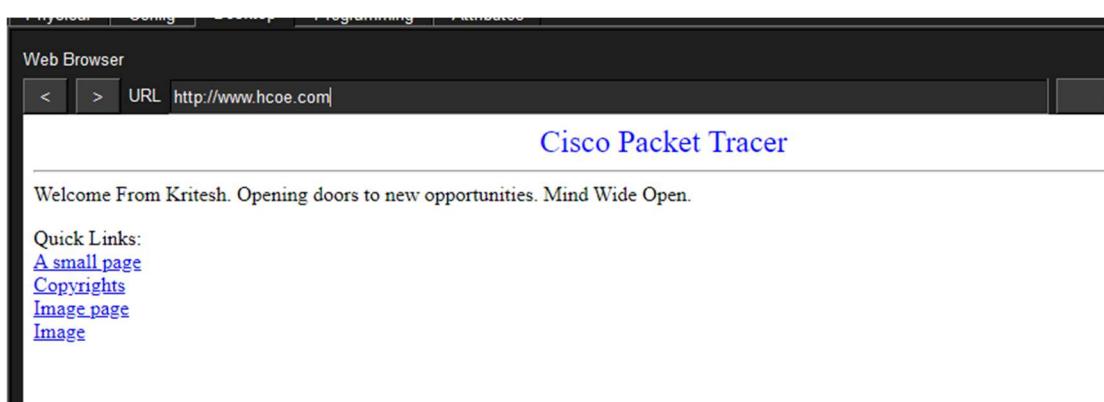
3. Web Server Verification:

The web browser on the client PC was opened, and the URL `http://www.hcoe.com` was entered. The custom HTML page created on the server was displayed successfully.

Web Browser

URL http://www.hcoe.com

Cisco Packet Tracer

Welcome From Kritesh. Opening doors to new opportunities. Mind Wide Open.

Quick Links:
A small page
Copyrights
Image page
Image

DISCUSSION AND CONCLUSION

During the lab session, we configured a centralized server to handle DHCP, DNS, and HTTP requests. We observed that the client PCs were able to obtain IP addresses automatically from the DHCP pool, eliminating manual configuration. The DNS server correctly resolved the domain name `www.hcoe.com` to the server's IP address, allowing us to access the web page hosted on the server. Hence the lab was completed with a proper knowledge and implementation of Server Configuration including DHCP, DNS, and Web Server using Cisco Packet Tracer.