

Lab no: 12

Date: 2024/09/27

Title: Configure DHCP server to assign IP addresses dynamically

Objectives:

- To know about DHCP server
- To understand how the DHCP server dynamically distributes IP addresses

Background Theory:

DHCP (Dynamic Host Configuration Protocol) is a network protocol used to automatically assign IP addresses and other network configuration parameters (like subnet mask, gateway, and DNS server) to devices in a network. This simplifies network management as devices no longer need to be manually assigned IP addresses.

A DHCP server holds a pool of available IP addresses and allocates one to a device when it joins the network. The allocation is temporary, called a "lease," and must be renewed periodically.

Process for DHCP Server to assign IP addresses:

Step 1: Setup one router, one server and end devices as required in the network.

Step 2: Enable router ports and set the IP address on the router's interface.

Step 3: Configure the IP address, subnet mask and default gateway on the server.

Step 4: Go to the **"Services"** tab on the server. Under **"DHCP"** section, enable the DHCP service.

Step 5: On each end devices, go to the **"IP Configuration"** tab and enable **"DHCP"**.

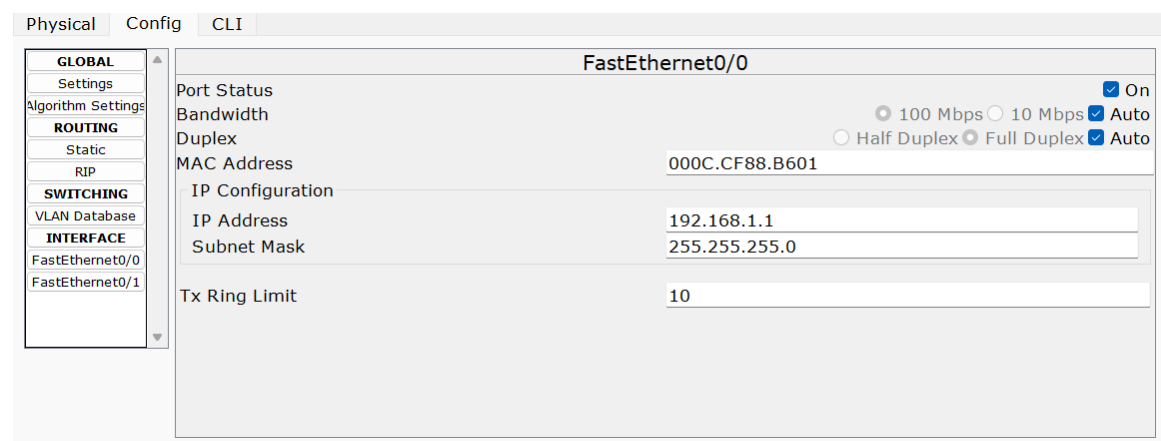


Fig: Router Configuration

Physical Config Services Desktop Custom Interface

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP

DHCP

Interface: FastEthernet0 Service: ☒ On ☐ Off

Pool Name: serverPool

Default Gateway: 0.0.0.0

DNS Server: 0.0.0.0

Start IP Address: .92 .68 1 0

Subnet Mask: .55 .55 .55 0

Maximum number of Users: 512

TFTP Server: 0.0.0.0

Add Save Remove

Pool Name	Default Gateway	DNS Server	Start IP Address	Subnet Mask	Max User	TFTP Server
serverPool	0.0.0.0	0.0.0.0	192.168.1.0	255.255.255.0	512	0.0.0.0

Fig: Server Configuration

Physical Config Desktop Custom Interface

IP Configuration X

IP Configuration

☒ DHCP ☐ Static DHCP request successful.

IP Address: 192.168.1.3

Subnet Mask: 255.255.255.0

Default Gateway: 0.0.0.0

DNS Server:

Fig: Assignment of IP dynamically

Observation and Findings:

Implement a DHCP Server configuration using one router, one server, and two endpoint devices.

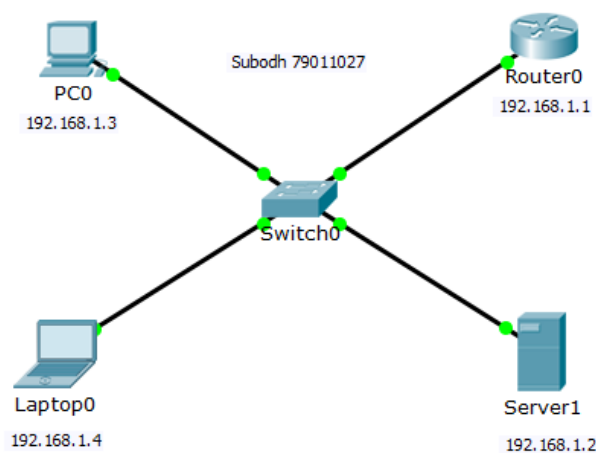


Fig: DHCP Server Configuration

Output:

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.1.4

Pinging 192.168.1.4 with 32 bytes of data:

Reply from 192.168.1.4: bytes=32 time=1ms TTL=128
Reply from 192.168.1.4: bytes=32 time=1ms TTL=128
Reply from 192.168.1.4: bytes=32 time=1ms TTL=128
Reply from 192.168.1.4: bytes=32 time=0ms TTL=128

Ping statistics for 192.168.1.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms

PC>|
```

Discussions:

After successfully obtaining the IP *192.168.1.3* via DHCP, a ping command was initiated to another device with the IP address *192.168.1.4*, which also received its IP from the DHCP server. The successful ping confirms that both devices are on the same network, with valid IP addresses assigned, and that communication between them is functioning properly.

Conclusion:

The successful ping between devices with IP addresses assigned by the DHCP server confirms the proper configuration of DHCP, enabling smooth communication and efficient network management.