

**Department of Computer Science and Engineering**

**Programme Name: B.Tech in Computer Science and Engineering (AI)**

**Semester V**

**Course Name: Computer Networks Lab**

**Course Code: PCC-CSM592**

**Experiment 8**

**Aim:** Examining DHCP protocol

Dynamic Host Configuration Protocol (DHCP) is used to dynamically assign Internet Protocol (IP) addresses to each host on your organization's network. DHCP also assigns [Domain Name System (DNS)](https://www.fortinet.com/resources/cyberglossary/what-is-dns) addresses, subnet masks, and default gateways. All of these enable devices to communicate with the internet and each other within the confines of your network. Assigning IP addresses, as well as subnet masks, DNS addresses, and other essential data would take far too much work and time if there are a few hundred devices. DHCP automatically provides this information to all of the devices that connect to your network.

**Security Considerations for Using DHCP**

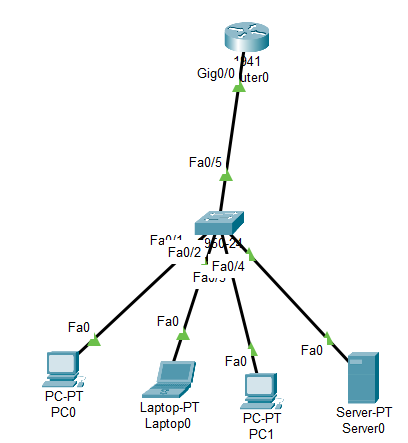
To ensure your DHCP servers do not present significant risk, there are a few DHCP security-related issues to keep in mind:

1.         A DHCP server can only provide a limited number of IP addresses. This means an attacker may be able to launch a [denial-of-service (DoS) attack](https://www.fortinet.com/resources/cyberglossary/dos-vs-ddos) by requesting so many IP addresses, rendering essential devices unable to connect.

2.         It is also possible for an attacker to use a false DHCP server to provide fraudulent IP addresses to the clients on your network.

3.         Users that get an IP address also get the DNS address—meaning, it is possible they can obtain more data than they should from those servers. It is best to use firewalls and secure connection tunnels via [virtual private networks (VPNs)](https://www.fortinet.com/resources/cyberglossary/what-is-a-vpn).

|  |  |  |  |
| --- | --- | --- | --- |
| S.No. | Device | Model Name | Qty. |
| 1. | PC | - | 2 |
| 2. | Laptop |  |  |
| 3. | Server | Server-PT | 1 |
| 4. | switch | 2950-24 | 1 |
| 5. | router | 1941 | 1 |



**CLI command for Router0:**

Router>enable

Router#configure

Router(config)#interface gigabitethernet 0/0

Router(config-if)#ip address 198.166.1.1 255.255.255.0

Router(config-if)#no shut

Router(config-if)#exit

Router(config)#ip DHCP pool ABC-POOL

Router(dhcp-config)#Network 198.166.1.0 255.255.255.0

Router(dhcp-config)#default-router 198.166.1.1

Router(dhcp-config)#dns-server 198.166.1.254

Router(dhcp-config)#exit

Router(config)#dns-server 198.166.1.254

Router(dhcp-config)#exit

Router(config)#exit

Router#write memory

Router#ping 198.166.1.3

**CLI command for Router:**

Would you like to enter the initial configuration dialog? [yes/no]: n

Press RETURN to get started!

Router>enable

Router#configure

Configuring from terminal, memory, or network [terminal]?

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface gigabitethernet 0/0

Router(config-if)#ip address 198.166.1.1 255.255.255.0

Router(config-if)#no shut

Router(config-if)#

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/0, changed state to up

Router(config-if)#exit

Router(config)#ip DHCP pool ABC-POOL

Router(dhcp-config)#Network 198.166.1.0 255.255.255.0

Router(dhcp-config)#default-router 198.166.1.1

Router(dhcp-config)#dns-server 198.166.1.254

Router(dhcp-config)#exit

Router(config)#exit

Router#

%SYS-5-CONFIG\_I: Configured from console by console

Router#write memory

Building configuration...

[OK]

Router#ping 198.166.1.3

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 198.166.1.3, timeout is 2 seconds:

.!!!!

Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/1 ms

Router#ping 198.166.1.3

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 198.166.1.3, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

Router#ping 198.166.1.4

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 198.166.1.4, timeout is 2 seconds:

.!!!!

Success rate is 80 percent (4/5), round-trip min/avg/max = 0/0/1 ms

Router#ping 198.166.1.4

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 198.166.1.4, timeout is 2 seconds:

!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/1 ms

**Command prompt for PC1**

Cisco Packet Tracer PC Command Line 1.0

C:\>ping 198.166.1.3

Pinging 198.166.1.3 with 32 bytes of data:

Reply from 198.166.1.3: bytes=32 time<1ms TTL=128

Reply from 198.166.1.3: bytes=32 time<1ms TTL=128

Reply from 198.166.1.3: bytes=32 time<1ms TTL=128

Reply from 198.166.1.3: bytes=32 time<1ms TTL=128

Ping statistics for 198.166.1.3:

Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

Approximate round trip times in milli-seconds:

Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>