**Introduction to DHCP**

Dynamic Host Configuration Protocol (DHCP) is a network protocol that is used to enable host computers to be automatically assigned IP addresses and related network configurations from a server.

DHCP (Dynamic Host Configuration Protocol) is a protocol used to provide quick, automatic, and central management for the distribution of IP addresses within a network. It is also used to configure the proper subnet mask, default gateway, and DNS server information on the device.

A DHCP server defines a scope, or range, of IP addresses that it uses to serve devices with an address. This pool of addresses is the only way a device can obtain a valid network connection.

This is another reason DHCP is so useful - because it allows lots of devices to connect to a network over a period of time without needing a massive pool of available addresses. For example, even if only 20 addresses are defined by the DHCP server, 30, 50, or even 200 (or more) devices can connect to the network so long as no more than 20 are using one of the available IP address simultaneously.

DHCP assigns IP addresses for a specific period of time (a lease period

The IP address assigned by a DHCP server to DHCP client is on a “lease”, the lease time normally varies depending on how long a client computer is likely to require the connection or DHCP configuration.

**How DHCP Server Works?**

1. When a new system is connected to Network, as a first step he searches for a DHCP Server in Network and when he is unable to find the same as he currently do not have any IP Address, the system sends a DHCP Discover message to all devices which are connected to network. This process is called as Broadcasting.
2. When DHCP Server receives the DHCP Discover message from the Client Computer, DHCP Server offers and broadcast’s a IP Address (Eg: 192.168.1.3) to all connected devices.
3. Now, when Client Computer receives the IP Address he broadcasts a request on network that he accepts the IP Address.
4. Then DHCP Server acknowledges the IP Address that Now Client Computer can use the IP Address. This is how Linux DHCP Server Works. This Whole process is called as DORA (Discover Offer Request Acknowledgement).

**Important Parameters of Linux DHCP Server**

1. option domain-name : Mention Domain Name eg : elinuxbook.com
2. option domain-name-servers : Mention DNS Servers eg: 192.168.0.100, 192.168.0.101 (Note : You can also mention the FQDN)
3. default-lease-time :  The Default time in Seconds till the time DHCP Server will assign a IP to Client Computer.
4. max-lease-time : The Maximum time in Seconds till the time DHCP Server will assign a IP to Client Computer.
5. subnet : Mention the Subnet IP Address eg : 192.168.0.0
6. netmask : Mention the Subnet Mask eg : 255.255.255.0
7. range : Mention the IP Range which will dynamically assigned by Linux DHCP Server to Client Computers. eg : 192.168.0.2 to 192.168.0.240
8. option routers : Mention the Gateway IP Address eg : 192.168.0.1
9. option broadcast-address : Mention your Broadcast Address eg : 192.168.0.255
10. hardware ethernet :  Mention your MAC Accress OR Physical Address eg : 00:0C:29:F7:BE:27
11. option host-name : Your systems Hostname OR Computer Name eg : dhcpserver

Configure DHCP Server:

**Step 1: Installing DHCP Server in Ubuntu**

1. Run the command below to install the DCHP server package, which was formerly known as dhcp3-server.

 $ sudo apt install isc-dhcp-server

1. When the installation completes, edit the file /etc/default/isc-dhcp-server to define the interfaces DHCPD should use to serve DHCP requests, with the INTERFACES option.

For example, if you want the DHCPD daemon to listen on eth0, set it likes so:

INTERFACES="eth0"

### And also learn how to configure a static IP address for the interface above.

Step 2: Configuring DHCP Server in Ubuntu

**3.** The main DHCP configuration file is **/etc/dhcp/dhcpd.conf**, you must add all your network information to be sent to clients here.

And, there are two types of statements defined in the DHCP configuration file, these are:

* **parameters** – specify how to perform a task, whether to carry out a task, or what network configuration options to send to the DHCP client.
* **declarations** – define the network topology, state the clients, offer addresses for the clients, or apply a group of parameters to a group of declarations.

**4.** Now, open and modify the main configuration file, define your DHCP server options:

$ sudo vi /etc/dhcp/dhcpd.conf

Set the following global parameters at the top of the file, they will apply to all the declarations below (do specify values that apply to your scenario):

option domain-name "**tecmint.lan**";

option domain-name-servers **ns1.tecmint.lan**, **ns2.tecmint.lan**;

default-lease-time 3600;

max-lease-time 7200;

authoritative;

**5.** Now, define a subnetwork; here, we’ll setup DHCP for **192.168.10.0/24** LAN network (use parameters that apply to your scenario).

subnet 192.168.10.0 netmask 255.255.255.0 {

 option routers 192.168.10.1;

 option subnet-mask 255.255.255.0;

 option domain-search "**tecmint.lan**";

 option domain-name-servers 192.168.10.1;

 range 192.168.10.10 192.168.10.100;

 range 192.168.10.110 192.168.10.200;

}

Step 3: Configure Static IP on DHCP Client Machine

**6.** To assign a fixed (static) IP address to a particular client computer, add the section below where you need to explicitly specify it’s MAC addresses and the IP to be statically assigned:

host centos-node {

 hardware ethernet 00:f0:m4:6y:89:0g;

 fixed-address 192.168.10.105;

 }

host fedora-node {

 hardware ethernet 00:4g:8h:13:8h:3a;

 fixed-address 192.168.10.106;

 }

Save the file and close it.

**7.** Next, start the DHCP service for the time being, and enable it to start automatically from the next system boot, like so:

**------------ SystemD ------------**

$ sudo systemctl start isc-dhcp-server.service

$ sudo systemctl enable isc-dhcp-server.service

**------------ SysVinit ------------**

$ sudo service isc-dhcp-server.service start

$ sudo service isc-dhcp-server.service enable

**8.** Next, do not forget to permit DHCP service (DHCPD daemon listens on port 67/UDP) on firewall as below:

$ sudo ufw allow 67/udp

$ sudo ufw reload

$ sudo ufw show

Step 4: Configuring DHCP Client Machines

**9.** At this point, you can configure your clients computers on the network to automatically receive IP addresses from the DHCP server.

Login to the client computers and edit the Ethernet interface configuration file as follows (take note of the interface name/number):

$ sudo vi /etc/network/interfaces

And define the options below:

auto eth0

iface eth0 inet dhcp

Save the file and exit. And restart network services like so (or **reboot** the system):

**------------ SystemD ------------**

$ sudo systemctl restart networking

**------------ SysVinit ------------**

$ sudo service networking restart

**HTTP Server Configuration**