**Week 4 Lab 4b Configuring a DHCP server on Linux**

DHCP (Dynamic host configuration protocol) used to assign an IP address automatically to Mobile, Laptop, PC, and other network devices so they can communicate. It employs a connectionless service model, using the UDP (User Datagram Protocol). DHCP uses a well-known UDP port 67 for the DHCP Server and the UDP Port 68 for the client.

Depending on implementation, the DHCP server may have three methods of allocating IP addresses:

**Dynamic allocation**

A network administrator reserves a range of IP addresses for DHCP, and each DHCP client on the LAN is configured to request an IP address from the DHCP [server](https://en.wikipedia.org/wiki/Server_(computing)) during network initialization. The request-and-grant process uses a lease concept with a controllable time period, allowing the DHCP server to reclaim and then reallocate IP addresses that are not renewed.

**Automatic allocation**

The DHCP server permanently assigns an IP address to a requesting client from a range defined by an administrator. This is like dynamic allocation, but the DHCP server keeps a table of past IP address assignments, so that it can preferentially assign to a client the same IP address that the client previously had.

**Manual allocation**

This method is also variously called *static DHCP allocation*, *fixed address allocation*, *reservation*, and *MAC/IP address binding*. An administrator maps a unique identifier (a *client id* or [MAC address](https://en.wikipedia.org/wiki/MAC_address)) for each client to an IP address, which is offered to the requesting client. DHCP servers may be configured to fall back to other methods if this fails.

Install and configure DHCP Server on Centos8:

**Dynamic allocation**

1. Check the vm has static IP address 10.0.2.1/24(for our lab). The DHCP server will automatically assign an IP address to the other devices in the network 10.0.2.1/24.
2. Install DHCP server: yum install dhcp-server
3. Configuring DHCP Server

The main configuration file of DHCP server is /etc/dhcp/dhcpd.conf. The sample of dhcpd.conf file is under /usr/share/doc/dhcp-serveer/dhcpd.conf.example

According to our lab design, add the following subnet to the configuration file, make sure you include the semi-colon at the end of each line.

subnet 10.0.2.0 netmask 255.255.255.0 {

range 10.0.2.128 10.0.2.254;

option routers 10.0.2.1;

option domain-name “online.uts.edu.au”;

option domain-name-servers 10.0.2.1;

default-lease-time 60;

max-lease-time 600;

}

1. Start the DHCP service: systemctl start dhcpd.service, can use tail -f /var/log/messages to DHCP process.
2. Set up Window Server vm Ethernet 1 to get IP address automatically.
3. Verify the lease cat /var/lib/dhcpd/dhcpd.leases

**Manual allocation**

1. Reserve IP address on DHCP Server:

If you have a MAC address of a device, you can also bind an IP address with them, for this open up the configuration file vim /etc/dhcp/dhcpd.conf and add these following lines at the end of the page to bind an IP address with the specific device.

host WinServer {

hardware ethernet 00:50:56:8c:20:fd;

fixed-address 10.0.2.20;

}

This will bind the IP address **10.0.2.20** with the machine whose MAC address is **00:50:56:8c:20:fd**.(use your Window Server mac address). Remember to restart your dhcpd service after you modify the dhcp configuration file.

1. Verify the Windows server have the reserved IP address.