Assignment - 4

Title - Study of DHCP

Problem Statement - Installing and configuring DHCP servers and write a program to install software on remote machine.

Objectives - Student should be able to understand Dynamic Host Configuration Protocol.

Theory -

DHCP is a client / server protocol that automatically provides host with its host IP address and other related configurations information such as subnet mask and default gateway.

Every device on TCP/IP based network must have a unique unicast IP address to access network resources with DHCP, the allocation is carried out easily and automatically for hosts added as removed from the network.

DHCP server maintains a pool of IP addresses and leases an IP address to any DHCP - enabled client when it starts up to the network.

Because the IP addresses are automatic or dynamic, when the addresses are not used then addresses are returned to pool for reallocation

A DHCP enabled client, upon accepting a lease offer, receives.

- A valid IP address for the subnet to which it is connecting.
- Additional parameters that DHCP server is assigned to assign client, for eg. default gateway, DNS servers.

DHCP lease process overview -

① The DHCP client requests an IP address by broadcasting DHCP discover message to the local subnet.

② The client is offered an address when a DHCP server responds with a DHCP offer message containing an IP address and configuration information for lease to the client. If no DHCP server responds to the client request, the client sends DHCP discover message at intervals of 0, 4, 8, 16 and 32 respectively plus a random interval between -1 and 1 seconds. If there is no response from a DHCP server after one minute the client can proceed in one of two ways.

(i) If client is using Automatic private IP addressing, the client self configures an IP address for its interface.

(ii) If client does not support alternate configurations, such as automatic IP addressing the client network initialization fails.

③ The client indicate acceptance of the offer by selecting the offered address and broadcasting a DHCP message request in response.

④ The client is assigned the address & DHCP server broadcasting a DHCP ack message in response finalizing the lease.

In the case of DHCP server failing to respond to DHCP discover, the hosts undergo a new set of sending DHCP discover requests every 5 minutes in the path as mentioned in step ②.

Setting up DHCP server steps -

① yum install dhcp

② vi /etc / dhcp / dhcp.conf

③ Edit configuration file as below or similarly -

```
subnet 192.168.8.0 netmask 255.255.255.0 {
    range 192.168.8.10  192.168.8.20;
    option domain-name-servers ns1 internal
                               example.org

    option domain-name "internal example.org";

    option routers 192.168.8.254

    option broadcast address 192.168.8.255;
```

default - lease - time 600;

max - lease - time 7200;

}

④ "chkconfig . dhcpd . on" : Run this to check dhcp config.

⑤ "service dhcp restart" : Run this to start dhcp service.

Conclusion -

We learnd about DHCP and usage & working of DHCP.