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Assignment 4

31330

Title: Study of DHCP

Objective: Student should be able to understand Dynamic Host Configuration Protocol.

Problem statement: Installing and configure DHCP server and write a program to install the software on a remote machine.

Theory:

What is DHCP?

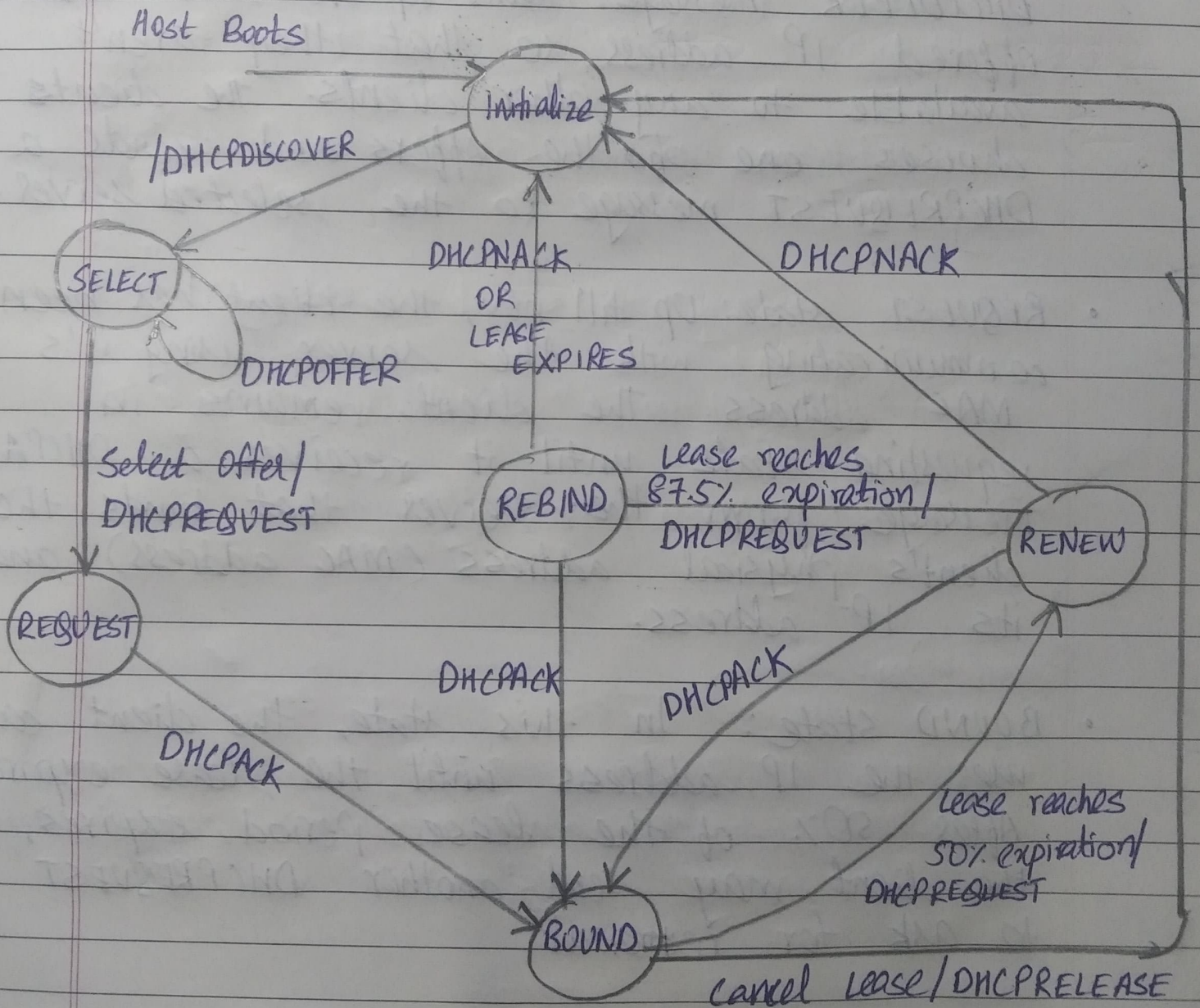
Dynamic Host configuration Protocol is a client/server that automatically provides an Internet protocol (IP) host with its IP address and other related configuration such as subnet mask and default gateways RFCs 2131 and 2132. Thus DHCP can be defined as an Internet Engineering Task force (IETF) standard based on Bootstrap Protocol (BOOTP), a protocol with which DHCP shares many implementation details. DHCP allows hosts to obtain necessary TCP/IP information from a DHCP server.

Advantages of DHCP:

- Assigns IP addresses to clients.
- Can install software applications on clients.
- Appropriate utilization of IP Addresses.

- Some IP addresses can be reserved from being assigned to prevent conflicts.

Transition states of DHCP servers for a client:



- INITIALIZE state: When the DHCP client first starts, it is in the INIT state (initializing state). The client broadcasts a DHCPDISCOVER message.

- SELECT State: After sending the DHCPDISCOVER message, the client goes to the selecting state. The server responds with a DHCPOFFER message. In these messages, the server offers an IP address. The server that sends a DHCPOFFER message locks up (reserves) the offered IP address so that they aren't available to any other clients. The clients chooses one of the offers and sends a DHCPREQUEST message to the selected server.

- REQUEST state: Up till now, the client has been communicating with the server using it's MAC address. The client remains in requesting state until it receives a DHCPACK message from the server that binds the client's physical address (MAC address) and its IP address.

- BOUND State: In this state, the client can use the IP address until the lease expires. After 50% of the lease period expires, the client may send another DHCPREQUEST to ask for renewal.

- RENEW State: The client remains in the renewing state until either of the following happens:
  - The client receives a DHCPACK. In this case the client resets it's timer and goes back to the bound state.

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- If a DHCPACK is not received, and 87.5% of the lease expires, the client goes to the rebinding state.

- REBIND state: The client remains in Rebinding state until one of ~~the~~ two things happens:

  - If the client receives a ~~DHCPNACK~~ DHCPNACK or the lease expires, it goes back to the initializing state and tries to get another IP address.

  OR

  - If the client receives a DHCPACK, it goes back to the bound state and resets the timer.

PART A]

server side steps for configuring a DHCP server

> su
> yum install dhcp
> vi /etc/dhcp/dhcpd.conf

<<press insert key>>
<<update conf file>>
<<press ESC, then press ":", then type wq>>

> systemctl start dhcpd.service
> systemctl enable dhcpd.service.
> systemctl status dhcpd service.
⇒ server is now running.

PART B]

Installing software on a remote system:

- Using SSH command:

#ssh root@192.168.5.1 (sample IP address)
pw: _____ (enter root password)

root #] yum install <application_name>

- Using a python script (inst.py)

import os.
os.system ("<install command>")

root #] python inst.py.

Conclusion:

Thus, we understood DHCP, how to configure a DHCP server and how to install software on a remote system.