Experiment No. 12: DHCP Server Configuration

AIM AND OBJECTIVE

Aim: To install and configure a DHCP server and write a program to install the software on a remote machine.

Objective (Learning Objective): To understand the concept of DHCP and the process of configuring a DHCP server and software installation on a network.

ORAL/VIVA IMPORTANT TOPICS

- DHCP (Dynamic Host Configuration Protocol) definition.
- The purpose and benefits of DHCP (Automation, Centralized Management, Efficient IP use).
- The DHCP process: The four key message types (DORA).
- The concept of an IP Address Lease.
- DHCP scope and address pool.

IMPORTANT QUESTIONS AND ANSWERS (Q&A)

Q1: What is DHCP? A: DHCP (Dynamic Host Configuration Protocol) is a network management protocol used on IP networks. It centrally and automatically assigns unique IP configurations, such as an IP address, subnet mask, and default gateway, to devices connected to the network.

Q2: Why is DHCP necessary? What problem does it solve? A: DHCP eliminates the need for a network administrator to manually enter an IP address and other configuration parameters for every new computer added to the network. This automation saves significant effort, reduces configuration errors, and ensures efficient use of the limited pool of available IP addresses.

Q3: Explain the four steps a DHCP client takes to get an IP address (The DORA Process). A: The process involves four key messages:

1. **Discover (DHCPDISCOVER):** The client broadcasts a message on the network to locate an available DHCP server.
2. **Offer (DHCPOFFER):** An available DHCP server responds to the client by offering an unused IP address and configuration parameters.
3. **Request (DHCPREQUEST):** The client formally accepts and requests the offered IP address.
4. **Acknowledge (DHCPACK):** The server sends a final acknowledgment, confirming the assignment and specifying the duration of the **IP lease**.

Q4: What is an IP Address Lease in DHCP? A: The IP Address Lease is the specific period of time for which the DHCP server allows the client to use the assigned IP address. Once the lease period is about to expire, the client attempts to renew it. If the client disconnects or the lease expires without renewal, the address is returned to the server's pool for reallocation.