NAME OF STUDENT:	CLASS:
SEMESTER/YEAR:	ROLL NO:
DATE OF PERFORMANCE:	DATE OF SUBMISSION:
EXAMINED BY:	EXPERIMENT NO:

Assignment No. 11(Group - C)

Title: Configure DHCP server and write a program to install the software on remote machine.

Objectives:

Understand working of DHCP

Problem Statement:

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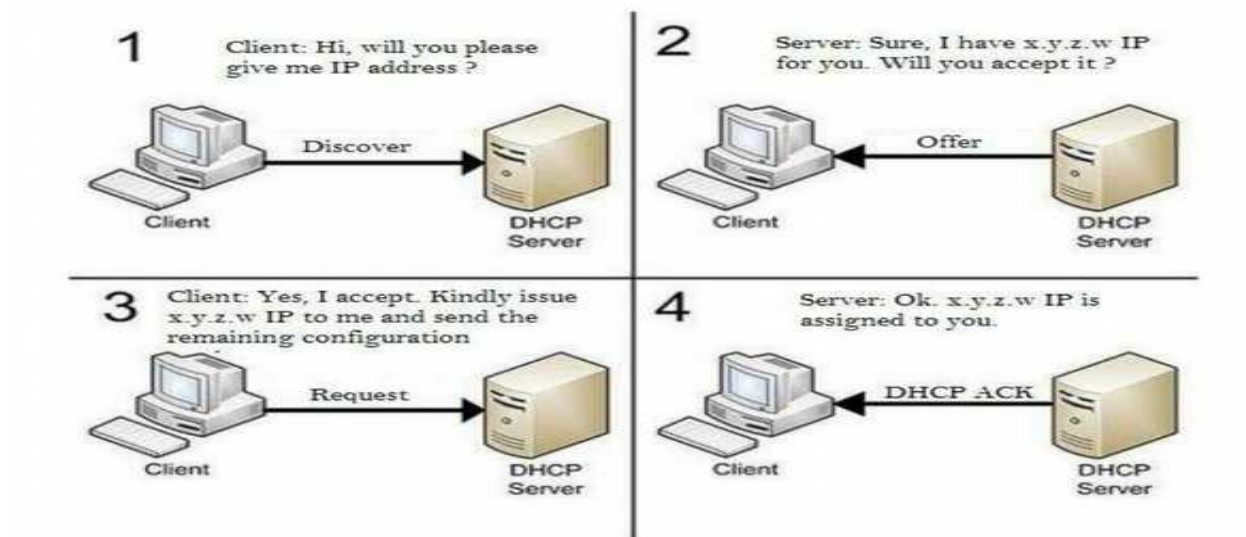
Outcomes:

Understand working of DNS lookup

Tools Required:

Software: jdk compiler.

Theory:

The Dynamic Host Configuration Protocol (DHCP) is a standardized network protocol used on Internet Protocol (IP) networks for dynamically distributing network configuration parameters, such as IP addresses for interfaces and services. With DHCP, computers request IP addresses and networking parameters automatically from a DHCP server, reducing the need for a network administrator or a user to configure these settings manually. DHCP is based on BOOTP but can dynamically allocate IP addresses from a pool and reclaim them when they are no longer in use. It can also be used to deliver a wide range of extra configuration parameters to IP clients, including platform-specific parameters. It was first defined in RFC 1531 in October 1993; but due to errors in the editorial process was almost immediately reissued as RFC 1541. Four years later the DHCPINFORM message type and other small changes were added by RFC 2131; which as of 2014 remains the standard for IPv4 networks. Depending on implementation, the DHCP server may have three methods of allocating IP-addresses:
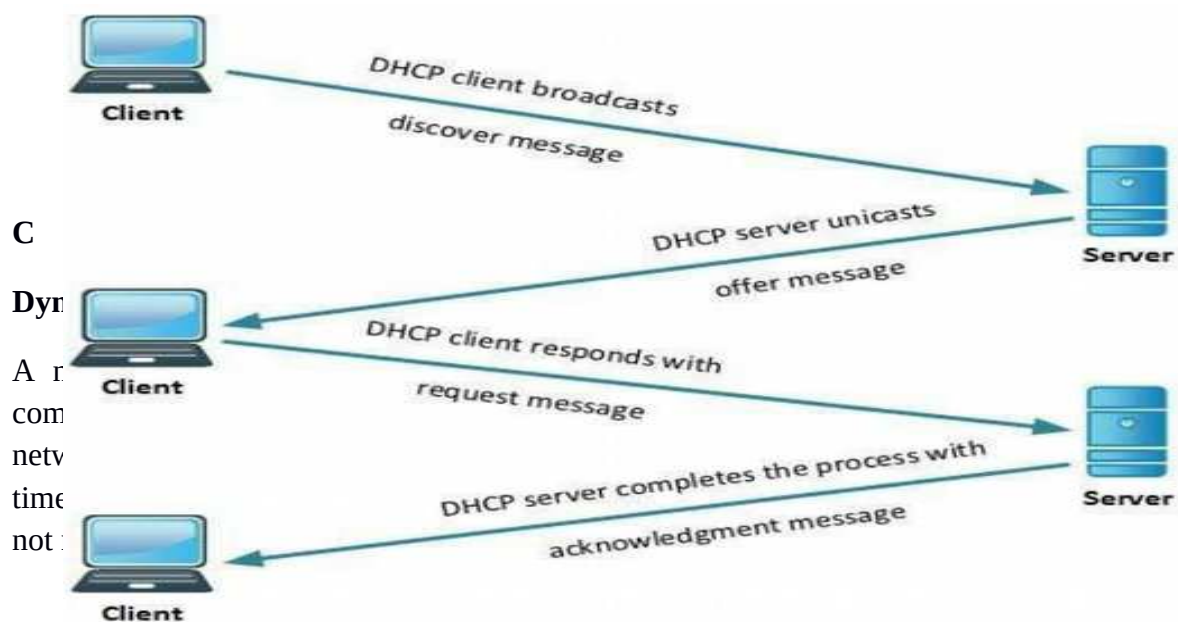
Automatic allocation:

The DHCP server permanently assigns an IP address to a requesting client from the range defined by the 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.

Static allocation:

The DHCP server allocates an IP address based on a precon_gured mapping to each client's MAC address. This feature is called static DHCP assignment.

Working:

The DHCP employs a connectionless service model, using the User Datagram Protocol (UDP). It is implemented with two UDP port numbers for its operations which are the same as for the BOOTP protocol. UDP port number 67 is the destination port of a server, and UDP port number 68 is used by the client. DHCP operations fall into four phases: server discovery, IP lease offer, IP request, and IP lease acknowledgment. These stages are often abbreviated as DORA for discovery, offer, request, and acknowledgment.

8	16	24	32
OP Code (1)	Hardware type (1)	Hardware address length (1)	Hops (1)
Transaction Identifier			
Seconds – 2 bytes		Flags – 2 bytes	
Client IP Address (CIADDR) – 4 bytes			
Your IP Address (YIADDR) – 4 bytes			
Server IP Address (SIADDR) – 4 bytes			
Gateway IP Address (GIADDR) – 4 bytes			
Client Hardware Address (CHADDR) – 16 bytes			
Server name (SNAME) – 64 bytes			
Filename – 128 bytes			
DHCP Options – variable			

DHCP discovery

The client broadcasts messages on the network subnet using the destination address 255.255.255.255 or the specific subnet broadcast address. A DHCP client may also request its last-known IP address. If the client remains connected to the same network, the server may grant the request. Otherwise, it depends whether the server is set up as authoritative or not. An authoritative server denies the request, causing the client to issue a new request. A nonauthoritative server simply ignores the request, leading to an implementation-dependent timeout for the client to expire the request and ask for a new IP address.

DHCP offer

When a DHCP server receives a DHCPDISCOVER message from a client, which is an IP address lease request, the server reserves an IP address for the client and makes a lease offer by sending a DHCPOFFER message to the client. This message contains the client's MAC address, the IP address that the server is offering, the subnet mask, the lease duration, and the IP address of the DHCP server making the offer. The server determines the configuration

based on the client's hardware address as specified in the CHADDR (client hardware address) field. DHCP request in response to the DHCP offer, the client replies with a DHCP request, broadcast to the server, requesting the offered address. A client can receive DHCP offers from multiple servers, but it will accept only one DHCP offer. Based on required server identification option in the request and broadcast messaging, servers are informed whose offer the client has accepted. When other DHCP servers receive this message, they withdraw any offers that they might have made to the client and return the offered address to the pool of available addresses.

DHCP acknowledgement

When the DHCP server receives the DHCP REQUEST message from the client, the configuration process enters its final phase. The acknowledgement phase involves sending a DHC PACK packet to the client. This packet includes the lease duration and any other configuration information that the client might have requested. At this point, the IP configuration process is completed. The protocol expects the DHCP client to configure its network interface with the negotiated parameters. After the client obtains an IP address, it should probe the newly received address (e.g. With ARP Address Resolution Protocol) to prevent address conicts caused by overlapping address pools of DHCP servers.

DHCP releasing

The client sends a request to the DHCP server to release the DHCP information andthe client deactivates its IP address. As client devices usually do not know when users may unplug them from the network, the protocol does not mandate the sending of DHCP Release.

Conclusion :

    Thus we have undestood how DHCP is working.

Questions:-

1.What Is The Dhcp Process For Client Machine?

2.List Some Benefits Of Using Dhcp?

3.What Is A Mac Address?

4.What Is Dhcp Spoofing?