COMPUTER NETWORKS ASSIGNMENT 9

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Aim: Installation and configuration of DHCP Server in Wireless Environment using an Access Point (Packet Tracer)

Objective: To understand and implement DHCP

Theory:

The Dynamic Host Configuration Protocol (DHCP) is a network management protocol used on UDP/IP networks whereby a DHCP server dynamically assigns an IP address and other network configuration parameters to each device on a network so they can communicate with other IP networks.[1] A DHCP server enables computers to request IP addresses and networking parameters automatically from the Internet service provider (ISP), reducing the need for a network administrator or a user to manually assign IP addresses to all network devices.[1] In the absence of a DHCP server, a computer or other device on the network needs to be manually assigned an IP address, or to assign itself an APIPA address, which will not enable it to communicate outside its local subnet.

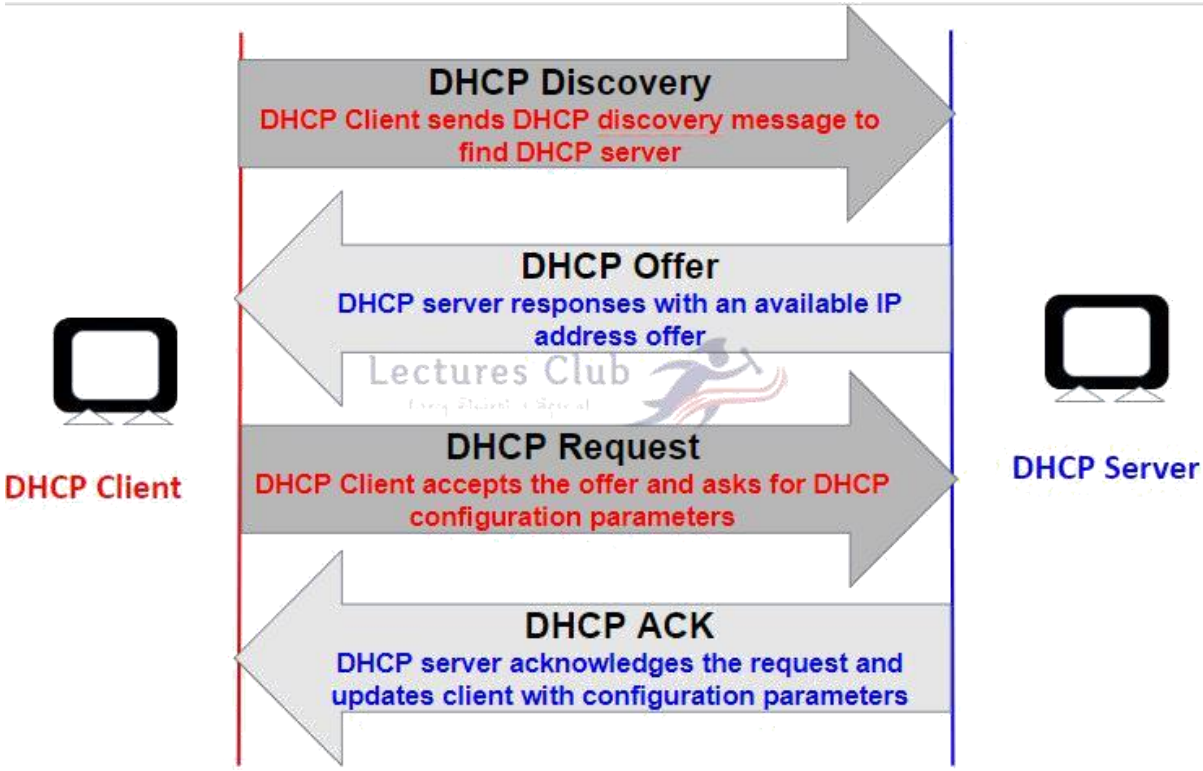
DHCP can be implemented on networks ranging in size from home networks to large campus networks and regional Internet service provider networks.[2] A router or a residential gateway can be enabled to act as a DHCP server. Most residential network routers receive a globally unique IP address within the ISP network. Within a local network, a DHCP server assigns a local IP address to each device connected to the network.

Dynamic Host Configuration Protocol(DHCP) is an application layer protocol which is used to provide:

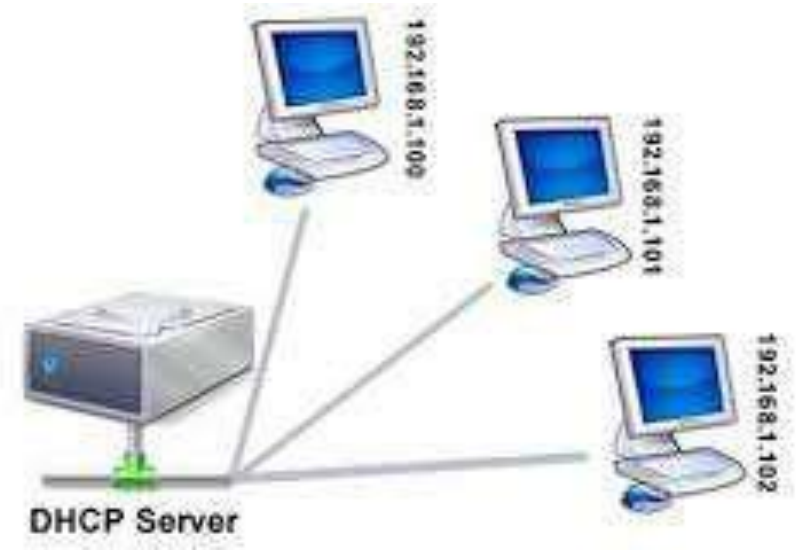
1. Subnet Mask (Option 1 – e.g., 255.255.255.0)
2. Router Address (Option 3 – e.g., 192.168.1.1)
3. DNS Address (Option 6 – e.g., 8.8.8.8)
4. Vendor Class Identifier (Option 43 – e.g., ‘unifi’ = 192.168.1.9 ##where unifi = controller)

DHCP is based on a client-server model and based on discovery, offer, request, and ACK.

DHCP port number for server is 67 and for the client is 68. It is a Client server protocol which uses UDP services. IP address is assigned from a pool of addresses. In DHCP, the client and the server exchange mainly 4 DHCP messages in order to make a connection, also called DORA process, but there are 8 DHCP messages in the process.

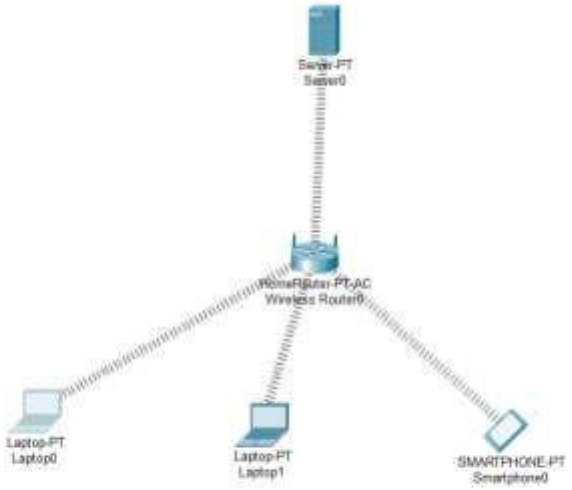


Steps involved in DHCP

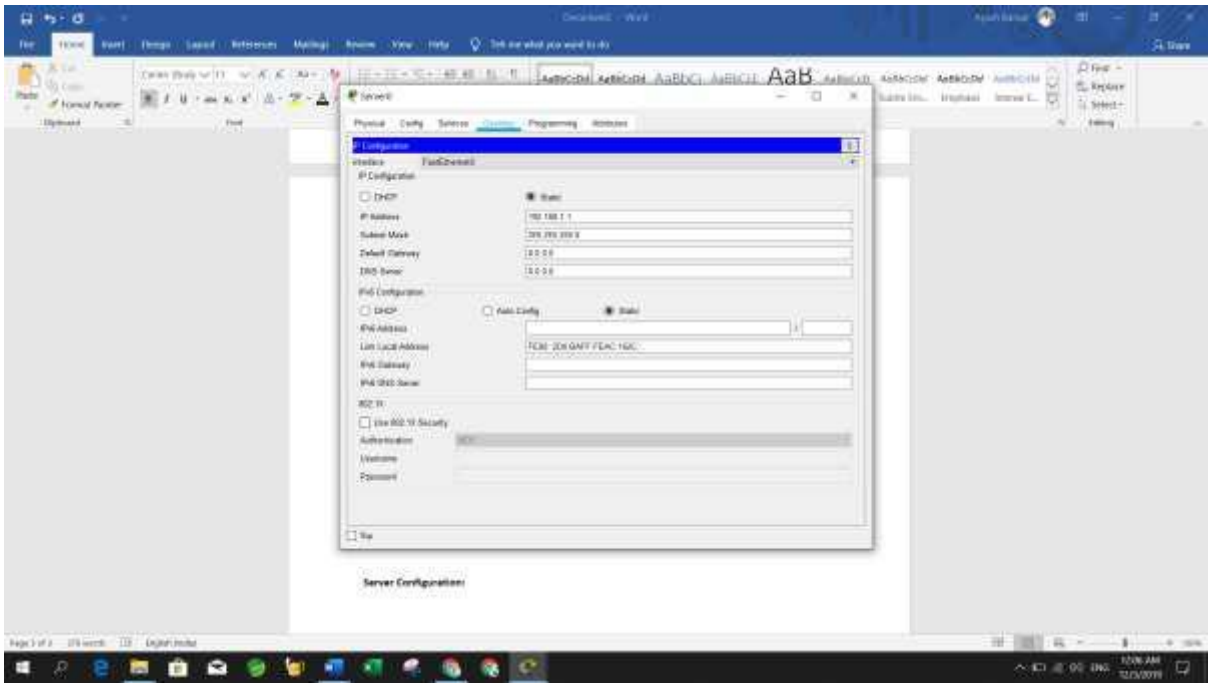


An illustrate of DHCP server

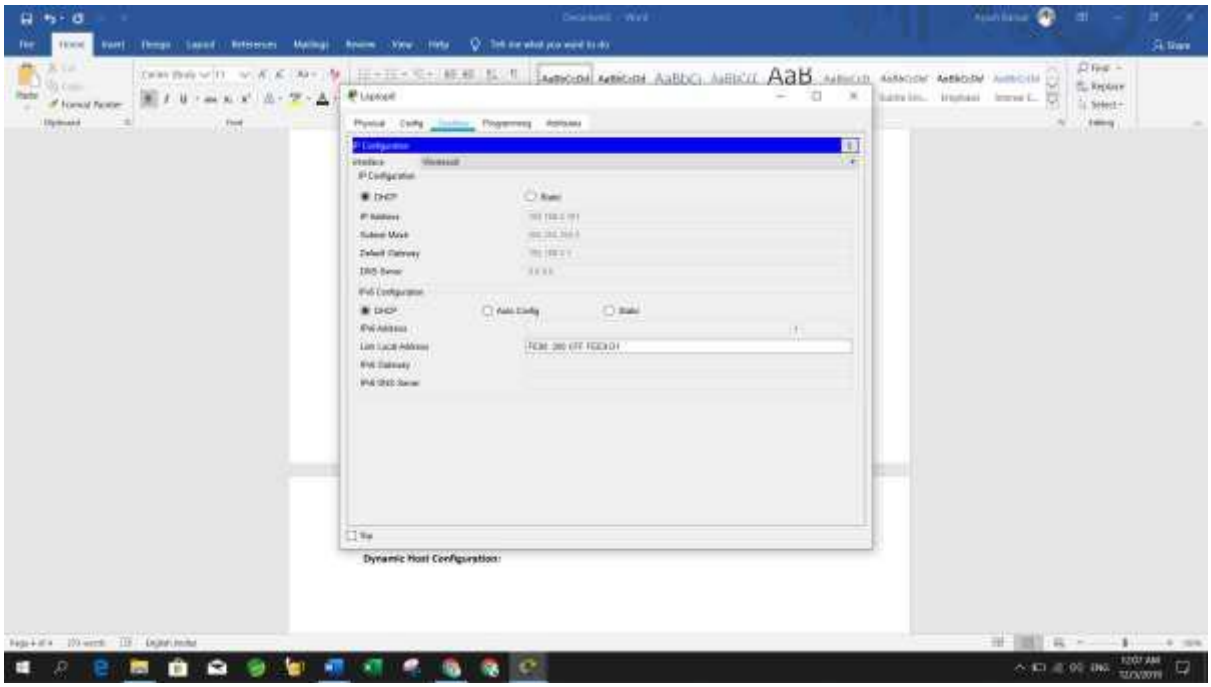
Network Diagram:



Server Configuration:



Dynamic Host Configuration:



Conclusion:

Hence, we have successfully understood and implemented a wirelesss network using DHCP.