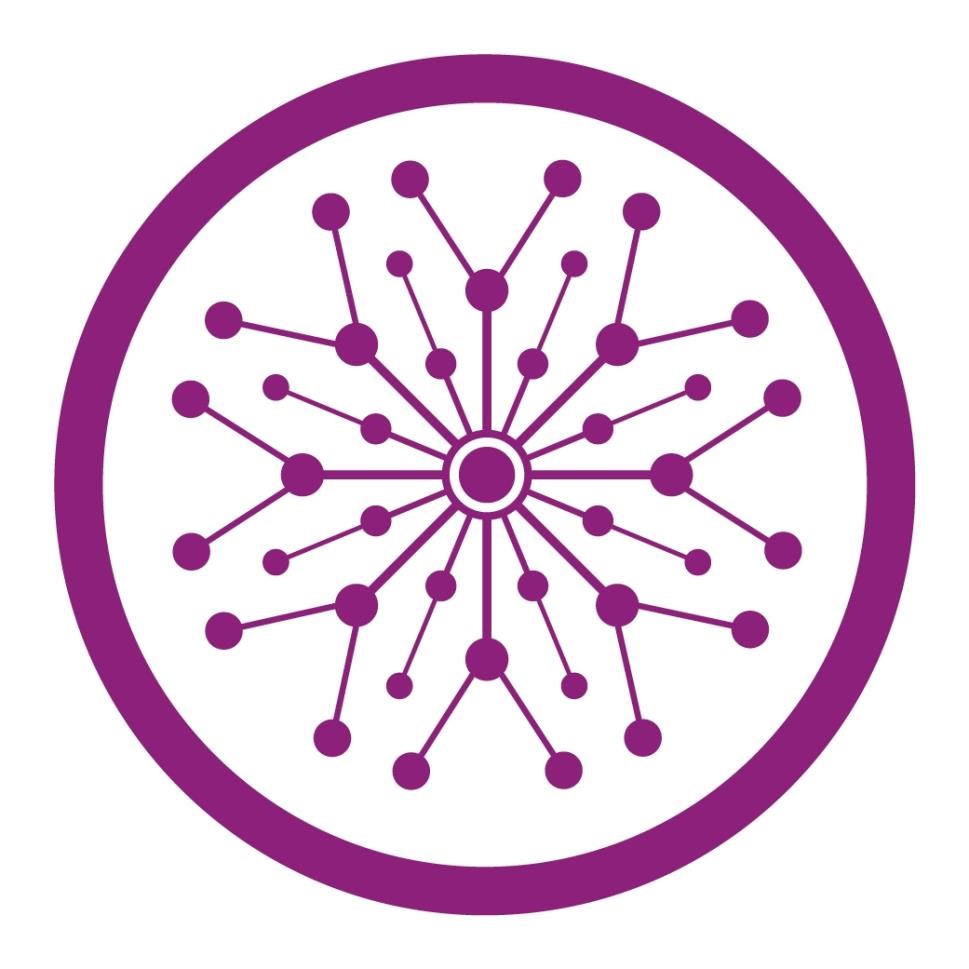
**Task-11**

**Computer Networks (Lab)**



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**DEPARTMENT OF SOFTWARE ENGINEERING**

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# DHCP, VLAN & DNS

## Dynamic Host Configuration Protocol (DHCP)

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As you probably know, DHCP is the protocol used to assign dynamic IP addresses to the devices of a local area network. As a result, network administrators will no longer need to go to every computer in a workplace and assign static IP addresses.

To put it very simply, each device trying to connect to the network sends out a DHCP discover message seeking an IP address. Then, a DHCP server allocates an address to that device by picking an available one out from the relevant databases.

Example

Let's say that you are connecting your laptop to Wi-Fi at a coffee shop. This happens in the following way:

1. Your laptop submits a DHCP Discover message.
2. A subnet mask, an IP address, and another piece of networking data are supplied by the DHCP server.
3. Now your laptop is ready to communicate with any other networked devices and connect to the internet.

## Virtual Local Address Network (VLAN)

A virtual local area network (VLAN) is a defined segment of a LAN that can be created so a group of devices appears to be on a single LAN even if the devices are physically attached to different sections of the building.

VLANs are useful for network admins as it allows dividing the network into small and distinct blocks, which can be done for better performance, security, or management costs. For hosts in different VLANs to communicate with each other, they must get routing configured between them, in most cases, on a Layer 3 device such as a router.

Example

In an office, there are three departments: HR, Finance, and IT. Without VLANs, all devices in these departments would be on the same network, meaning anyone from HR could communicate directly with Finance or IT, potentially compromising security or causing network congestion. But, with VLANs, the network administrator creates three VLANs

* VLAN 10: HR
* VLAN 20: Finance
* VLAN 30: IT

Now, each department’s devices can communicate only within their own VLAN unless routing is configured. This provides better security and performance because the traffic between departments is isolated.

**Domain Name System (DNS)**

DNS connects web addresses, which people can easily remember, to server addresses that computers understand. Such a web address would be for instance, www.example.com whereas its server address would be 192.168.1.1.

For instance, when you enter an internet address in your web browser, the DNS helps the computer to enter into the right website. This is done through DNS servers that keep records of specific domain names and IP addresses.

**Example**

For instance, if your intention is to go to www.example.com, then here is how it is done

* Last The first step would be to type www.example.com on the browser.
* The next step is for the browser to contact a DNS server applying for the IP address of the site in question.
* As a result of this request, one DNS server that holds this address is queried to return the IP e.g. 93.184.216.34
* The last and final step is your browser making use of that IP address you acquired to load up the site with that content.