INTERNSHIP JULY 2025

WEEK 1

We learnt everything about web but for beginners, we learnt about careers in web like back end, front end, designers, dev Ops, then we were introduced to front end programming like HTML, CSS and JS, then we set up environment using word press. So, we need to be detailed on this but not so deep since it was one week.

WEEK 2

We covered network basics like the OSI model but the attention was put on the first three layers, learnt network devices like switch, router, IP addresses, network protocols, then simulated network using packet tracer, learnt how to set VLANS and trunks using CISCO packet tracer,

NETWORKING

- Connection of two or more devices
- Media (Vacuum(Wireless) or wired, light), Devices (Switches, Routers, Firewalls, End users) and services
- Devices are connected through media
- If u get the media, then u have to debate on the services, and then devices come in
- Understanding the OSI model
    - 1. Physical (Layer 1)
    - 2. Data Link (Layer 2)
    - 3. Network (Layer 3)
    - 4. Transport (Layer 4)
    - 5. Session (Layer 5)
    - 6. Presentation (Layer 6)
    - 7. Application (Layer 7)
- **Physical layer** describes the physical characteristics of the device like the port
- **Data Link** is the medium between the physical and the network layers by encapsulating the characteristics like the unique properties and physical addresses. Involves devices like switches. Uses ARP (Address Resolution Protocol) which is the first protocol established when establishing a network.
- **Network Layer.** It uses IP addresses and uses devices like routers (route is a path from one source to a given destination. Routing is the process of identifying the shortest route at the lowest cost).

- ***Hop count*** *refers to the number of routers or network devices a packet passes through from source to destination.*
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- ***Purpose:***
- *1. *Route calculation*: Determine the path packets take.*
- *2. *Network diagnostics*: Identify potential routing issues.*
- *Importance:*
- *Hop count helps network administrators understand network topology and troubleshoot connectivity problems.*
- Transport Layer deals with carrying packets from source to destination
- **Session Layer** deals with keeping one in or kicking them off the network
- **Presentation layer** does the de-encapsulation
- **Application layer** is the application utilizing the network.

NETWORK LAYER – IP ADDRESSES

IPv4 – 4 octets, 32 bits. An octet is made up of 8 bits Written and separated by dots, then means we can obtain 2^{32} addresses. Then to manage the IPs, we use NAT (Network Address Translation) to translate the private IPs to public. We use public on WANs and private on LANs. Its subdivided into classes like class A, class B etc. For class A the first bit is a 0, and for that reason we can have decimals from 1-126 since 127 is reserved for private use. For class B (128-191) the first bit is a 1 and so on for class C (192 – 255).

Subnet Mask

Purpose:

A subnet mask divides an IP address into network and host parts.

Function:

1. *Identifies network*: Determines the network ID.

2. *Identifies host*: Determines the host ID.

Format:

Typically represented in dotted decimal format (e.g., 255.255.255.0).

Importance:

Subnet masks help routers route traffic within networks.

Communication between two different networks can only be done by a router, otherwise the switch can handle. This is done my ANDing the source and destination IP and subnet

Network segmentation – Network subnet

IPv6 – 128 bits

NETWORK SWITCHING

Happens at the Data Link layer.

Subdivided into distribution, Access logically

TYPES OF PORTS

- Ethernet – 10Mbps
- Fast ethernet – 100Mbps
- Gigabit Ethernet – 1GBps
- Ten Gigabit Ethernet – 10GBps
  We can achieve higher values by aggregation e.g if we want 40GB then we do 4 x 10Gb

HOW SWITCHING IS DONE

- At the data link layer, encapsulation is done. source MAC address, IP and the destination, then the ARP is run. We can run a command arp -a
- At the switch, the port label is checked and mapped accordingly, and so it needs a high security
- Switch deals with same network, otherwise a router is called in since it connects to a gate way. The device and the gateway must be on the same IP. We can test for network connectivity using the ping command
- There can a problem of looping, but this can be avoided by using the Spanning Tree Protocol
- It's only a standard fool who could be convinced by such a bastard

We shall organise that and be detailed enough but at that level

WEEK 3

We did Repository project and we had to install and configuring ubuntu server using Microsoft hypervisor. We were also told to brainstorm a project and ours was Attendance Management System for a university and then we had to do the ERD using work bench, then implement the project using web technologies, and host on ubuntu server.

WEEK 4

We handled Moodle management, we were taken through the details of Moodle, advised to download Moodle 5.0.1 and then set the environment and modify it to suit the standards of our institutions, then configure with SCORM to enable lecturers also do their work.

It's a learning management system. Others can be Blackboard, Canvas, Schoology, Claroline

Set up moodle 5.0, add a them and customize it

Download a zip folder of moodle 5.0

Extract it to your choice folder

Start moodle, runs through the console, then go to browser and type localhost

Will find a file named config.php

SCORM

SME

Moodle.arg has the plugins

So we shall be detailed there as well.