Cycle 1

16 / 2 / 24 INTERNETWORKING BASICS 02

AIM:

To understand internetworking:

- Familiarization of Network Hardware devices
- Familiarization of Network cables and connectors
- Familiarization of color coding - crimping - internet working Operating Systems - configurations
- Studying of TCP/IP Protocol Suite
- Familiarization of Cisco Hub, Switch, Router, Access point commands

THEORETICAL BACKGROUND

Cycle 1 focuses on foundational aspects of internetworking, covering hardware devices, cabling and connectors, crimping techniques, operating system configurations and an overview of the TCP/IP protocol suite.

Familiarization of Network Hardware Devices

Network devices are the physical components used to connect computers within a network to enable communication and data transfer.

Key devices:

- Routers: Devices that connect multiple networks together and route packets from one network to another.
- Switches: Devices that connect multiple on a LAN, using MAC addresses to forward data to the correct destination
- Hubs: Simple devices that connect multiple Ethernet devices, making them act as a single network segment. Hubs broadcast data to all devices on a network.

- Access Points (AP): Devices that allow wireless devices to connect to a wired network using WiFi or related standards

Familiarization of Network cables and connectors

Network cables and connectors are essential for setting up and maintaining a network. They include:

- Ethernet cables (Cat 5, Cat 6, Cat 5e etc): Used to connect devices within a LAN

- Fibre Optic cables: Used for long distance, high performance data networking

- Coaxial cables: Used for cable internet connections and other telecommunications

- Connectors (RJ45, RJ11, LC, SC etc): Physical interfaces used to connect cables to devices.

Familiarization of color coding - crimping

Crimping involves connecting networking ~~to the~~ ~~on~~ connectors to the ends of cables. Color coding is crucial for ensuring the correct wiring of network cables, especially for Ethernet cables which follow T568A or T568B standards

- T568A and T568B: Both wiring schemes define the order of the wires placed into the RJ45 connector the difference in the position of the green and orange wire pairs

- Crimping tools: Used to attach connectors to cables, ensuring a tight and secure connection.

Internetworking Operating systems - configuration

OS in networking devices are specialised software that manage network resources and enable network services

Key tasks:

- Configuration of network interfaces: Setting up LAN and WAN interfaces to enable communication

- Routing and switching configurations: Defining how data is forwarded between devices

- Security settings: Configuring firewalls, access lists and other security measures.

Study of TCP/IP Protocol suite

TCP/IP Protocol suite is the foundational set of protocols for the internet and most private networks. It includes:

- Transmission control Protocol (TCP): Ensures ordered reliable delivery of a stream of bytes from one program

on one computer to another program on another computer

- IP: Routes packets across network boundaries
- Other protocols UDP, ICMP, ARP etc also play role in connectionless communication, network diagnostic tools and resolving IP address to MAC addresses.

Familiarization of Cisco Hub, Switch, Router, Access point commands

Cisco devices are widely used in networking. Familiarity with their command line interface (CLI) commands is essential for setting up and trouble shooting network configurations.

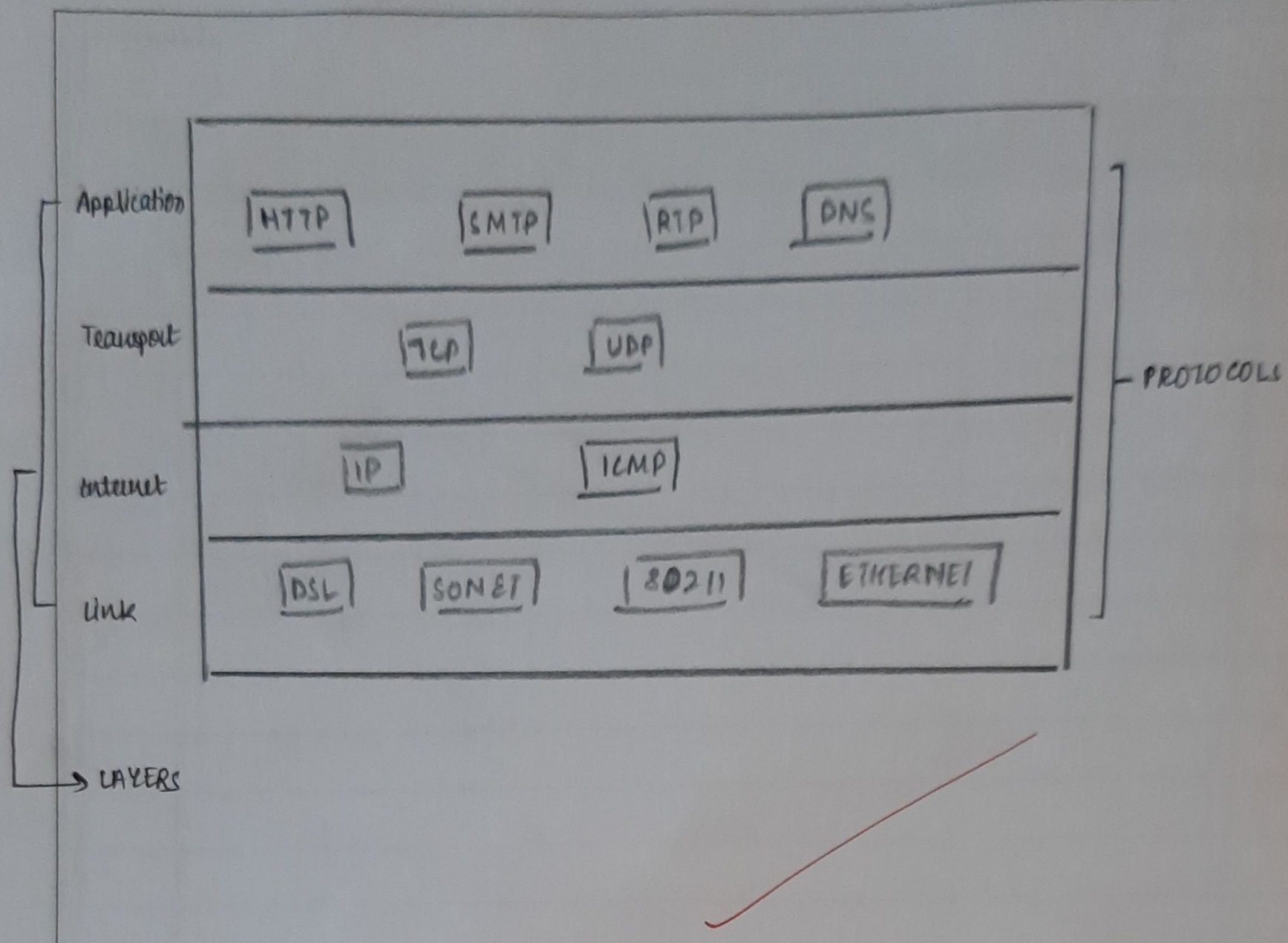
Basic commands:

- 'enable': Enters privileged EXEC mode
- 'configure terminal': Enters global config mode.
- 'ip address <ip address> <subnet mask>: Sets an IP address for an interface
- 'show running-config': displays current config
- 'Interface <type/number>': Enters interface config mode.
- 'show ip interface brief': Provides a summary of IP config for all interfaces.

CONCLUSION

Familiarised with network components and concepts of internetworking.

Viva
1/3/24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