Day 1

Topic: Networking Fundamentals

Objective: To understand the foundational concepts of computer networking, network topologies, and data transmission mechanisms.

Theoretical Concepts:
The session began with an in-depth overview of what constitutes a computer network. We explored the differences between LAN (Local Area Network), MAN (Metropolitan Area Network), and WAN (Wide Area Network). The instructor explained network topologies such as Star, Bus, Ring, and Mesh, highlighting the advantages and failure points of each. A significant portion of the theory focused on data transmission modes (Simplex, Half-Duplex, Full-Duplex) and the role of MAC addresses in local communication.

Practical Work:
In the practical lab, we used Command Prompt (Windows) and Terminal (Linux) to investigate network configurations. We executed commands like *ping* to test connectivity, *tracert/traceroute* to map the path of packets, and *netstat* to view active connections. We drew network diagrams representing a secure enterprise architecture, placing firewalls and routers at strategic edge points.

Tools Used: Windows CMD, Linux Terminal, Cisco Packet Tracer (for diagrams).

Outcome: Gained a solid understanding of how devices communicate and the physical/logical structure of networks.