Day 34

Topic: IP Addressing and Subnetting

Objective: To master IPv4 addressing, classes, and the logic of subnetting to optimize network performance and security.

Theoretical Concepts:
Today's focus was on the Internet Protocol (IP). We dissected the structure of an IPv4 address, understanding the 32-bit binary representation. We covered the five classes of IP addresses (A, B, C, D, E) and the difference between Public and Private IPs (RFC 1918). The core complexity of the day was **Subnetting**—borrowing host bits to create network bits. We calculated subnet masks, network IDs, and broadcast IDs for various CIDR notations (e.g., /24, /26).

Practical Work:
We used the Linux terminal to inspect network interfaces using *ifconfig* and *ip addr*. We manually calculated subnets for a hypothetical organization requiring 5 distinct departments. We then verified our calculations using online Subnet Calculators and configured static IP addresses on virtual machines to test inter-subnet routing.

Tools Used: Kali Linux, Subnet Calculator, Terminal.

Outcome: Proficient in calculating subnets and configuring IP settings manually on Linux and Windows systems.