Networking Fundamentals

Understanding Networks, Internet, Hosts, and End Systems

1. Network

A **network** is a collection of interconnected devices (such as computers, smartphones, servers) that are able to communicate and share resources.

- Devices are linked through communication channels (e.g., wired Ethernet, wireless Wi-Fi).
- Example: A university computer lab network.

Network = Group of connected devices sharing data/resources.

2. Internet

The **Internet** is the global *network of networks*, connecting millions of smaller networks worldwide.

- Uses common communication protocols like **TCP/IP**.
- Provides services such as email, web browsing, file transfer.
- Example: Sending an email across different continents.

Internet = Global interconnection of networks.

3. Host

A **host** is any device with an **IP address** that can send or receive data over a network.

- Hosts run applications that communicate via the network.
- Examples: laptops, smartphones, servers, IoT devices, networked printers.

Host = Device with an IP address that communicates in a network.

4. End Systems

End systems are hosts located at the "edge" of the network, serving as the **source or destination** of communication.

- Unlike routers, they do not forward traffic, but instead generate or consume it.
- Examples: Your smartphone accessing YouTube, or a web server storing videos.

End system = Host at the edge of the network.

5. Relationship

End Systems (Hosts) $\longleftrightarrow$ Networks $\longleftrightarrow$ Internet

- End systems (hosts) connect to networks.
- Networks interconnect to form the Internet.
- The Internet enables global communication between end systems.