

# UNDERSTANDING INTERNET INFRASTRUCTURE

## BRIEF HISTORY OF THE INTERNET INFRASTRUCTURE

- US Department of Defence wanted to connect some research centers together to enable them share expensive computer time on mainframes
- Government thereafter established ARPANET, an acronym for **A**dvanced **R**esearch **P**rojects **A**gency **N**ETwork
- The network connected only 4 computers located at
  - University of California at Los Angeles
  - Univ. of Stanford
  - Univ of California at San Barbara
  - Univ. of Utah

The connections were made via

Local Area Network

Paging network

Satellite network

all using packet switch

- By 1973 to ensure an open system, Internet Protocol (IP) was developed to enable different LAN's work together
- Different LAN's were interconnected using GATEWAYS (now called ROUTER)
- Internet infrastructure can be said to consist of 3 major components

IP ADDRESS/ DOMAIN NAME SYSTEM

SERVERS/ (INTERNET PROTOCOL)

SWITCHES and TRANSMISSION LINKS (NETWORK)

All these are interconnected to produce a complex interconnection of computers, devices, and sub-networks.

➤ A network starts with a data terminal equipment whose function is to convert any information to electrical signal and to arrange these signal in the form of packets arranged in accordance with rules established by INTERNET PROTOCOL. Similar to letters enclosed in ENVELOPES with stamp attached and dropped in the post office.

➤ NETWORK ADDRESSING:

Each computer or device connected to the internet has a unique address which distinguishes it from every other computer or device. No two devices have the same address.

IP version 4 (IPv4) has a 32-bit address field giving approximately 4.3 Billion unique addresses.

➤ The world will soon run out of IP addresses when we begin to have widespread adoption of 4G or 5G services, the network of things (devices, sensors, embedded microchips e.t.c )  
Virtually anything can in future be assigned an IP address and connected to the internet space.

➤ IP version 6 (IPv6) has been developed to address this future explosion of the internet.

➤ IPv6 uses 128 bit address space, this will provide us with  
340 Billion Billion Billion Billion unique addresses

340,000,000,000,000,000,000,000,000,000,000,000,000,000 addresses







