Classic Infrastructure

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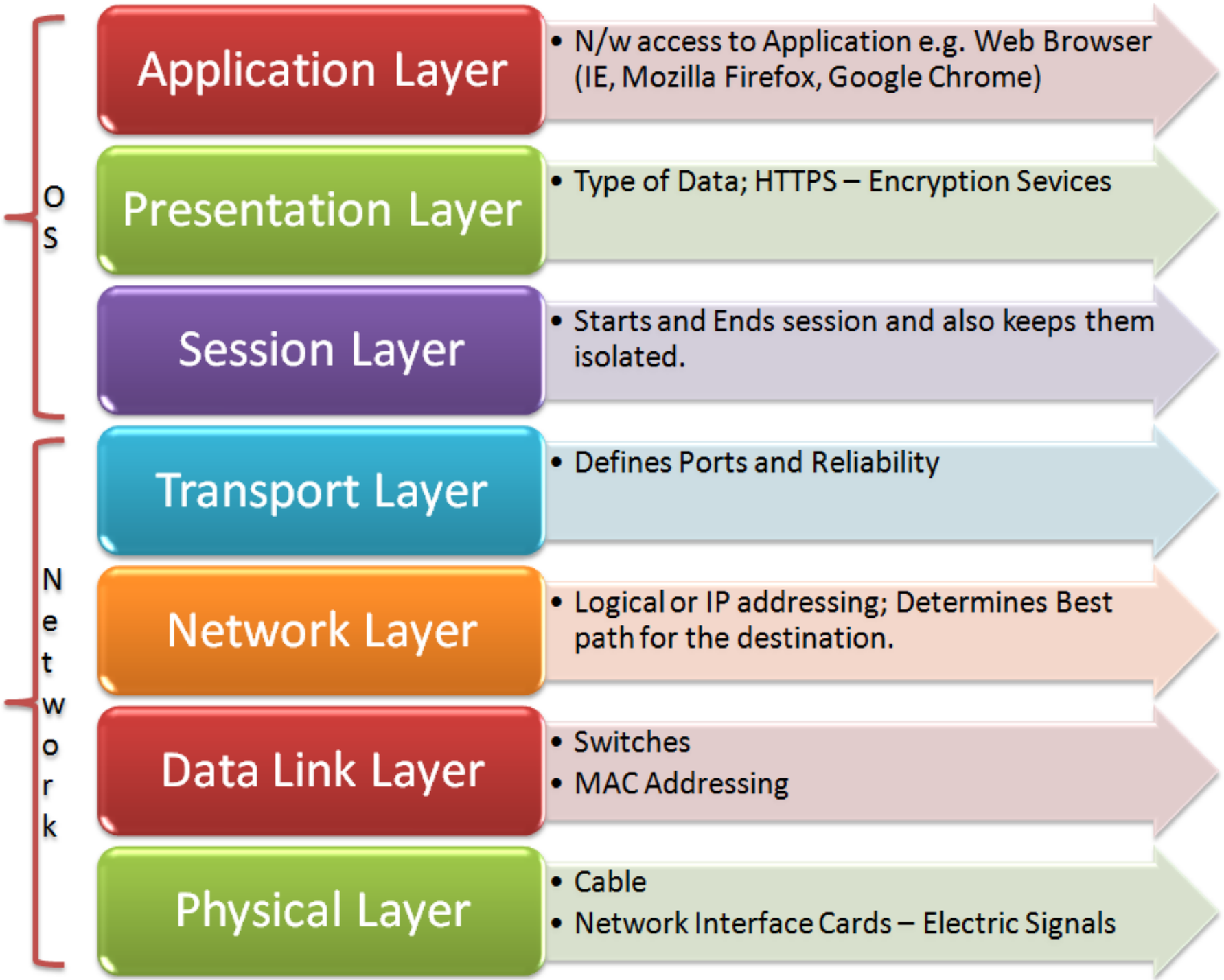
OSI Model


OS
Application Layer
• N/w access to Application e.g. Web Browser (IE, Mozilla Firefox, Google Chrome)
Presentation Layer
• Type of Data; HTTPS – Encryption Sevices
Session Layer
• Starts and Ends session and also keeps them isolated.
Network
Transport Layer
• Defines Ports and Reliability
Network Layer
• Logical or IP addressing; Determines Best path for the destination.
Data Link Layer
• Switches
• MAC Addressing
Physical Layer
• Cable
• Network Interface Cards – Electric Signals

Hardware and Networking Devices

Repeater

Problem : on a long wire, signals gets weak.

Function : to strengthen signal & extend it to a new media segment

Physical Layer 1 device
(works with bits)

Hub

Problem : workgroups need shared access to printers, files, etc

Function : to provide concentrated connections for workgroups

Multi-port repeater

Physical Layer Device (works with bits)

Bridge

Problem : too much traffic jams network

Function : to segment traffic and contain traffic jams

Data Link Layer Device
(works with MAC addresses)

Switch

Problem : shared access often results in traffic jams

Function : to concentrate connections and segment traffic

Combines advantages of hub & bridge

Multi-port bridge

Data Link Layer device (works with MAC addresses)

Router

Problem : how to find network path

Function : to direct traffic over multiple paths
to contain traffic jams
to connect different network topologies

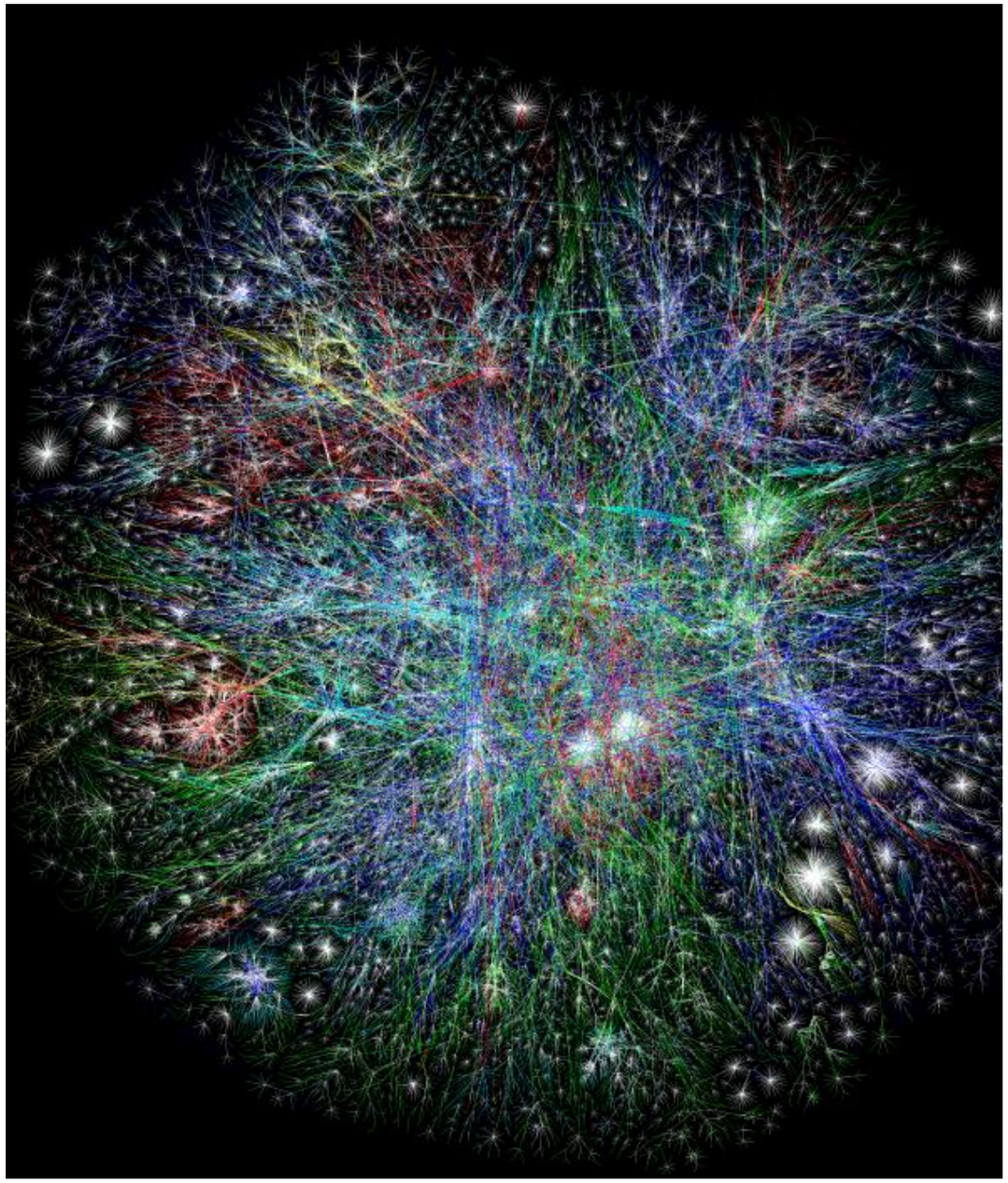
Network Layer Device (works with IP addresses)

Server

- Problem : requirement of high computer power
- Function : to store, retrieve and send computer files and data to other computers on a network

Computer Network

- Computer network is a group of computer systems and other computing hardware devices that are linked together through communication channel to facilitate communication and resource-sharing among wide range of users



Types of Networks

- Local Area Network (LAN) : connects computers and devices in a limited geographical area such as a home, school or office building

- Wide Area Network (WAN) : covers a large geographical area such as a city, country, or spans

- Metropolitan Area Network (MAN) : is a large computer network that usually spans a city or a large campus

- Personal Area Network (PAN) : is a computer network used for communication among computer and different information technological devices close to one person. Some examples of devices that are used in a PAN are personal computers, printers, fax machines & telephones

- Campus Area Network (CAN) : is made up of an interconnection of LANs within a limited geographical area

- Home Area Network (HAN) : is a residential LAN used for communication between digital devices typically deployed in the home, usually a small number of personal computers and accessories, such as printed and mobile computing devices

- Storage Area Network (SAN) : is a dedicated network that provides access to consolidated, block level data storage & used to make storage devices, such as disk arrays and tape libraries

Components of Network System Infrastructure

Domain Name System (DNS)

- A database that is used by TCP/IP applications to map between hostname and IP addresses

- A hierarchical namespace for hosts and IP addresses

- A globally distributed, scalable, reliable database

- Comprised of three components

  Namespace and Resource Record

  Name Server

  Resolver (client)

Dynamic Host Configuration Protocol (DHCP) Server

- A centralized database of IP addresses and other TCP/IP configurations
- DHCP used for dynamic allocation of IP addresses
- Configuration parameters such as Default Gateway, DNS Servers and NetBios can be distributed by DHCP

Mail Server

- A mail server is a computer that servers as an electronic post office for email. Mail exchanged across network is passed between mail servers that run specially designed software

- Mail server receives emails from uses and then forward them to the recipients.

File Server

- File server is used to share files in network
- It provides remote access to files

Web Server

- A web server is a program that generates and transmits responses to client requests for web resources
- Client request handling consists of several key steps
  - Parsing the request message
  - Checking that the request is authorized
  - Associating the URL in the request with a file name
  - Constructing the response message
  - Transmitting the response message to the requesting client

Proxy Server

- A proxy server is a server that acts as an intermediary between a workstation user and the internet so that the enterprise can ensure security, administrative control and caching service
- Indirect access to other networks
- All devices on the local network have to go through it before accessing information on the internet
- Proxy share a connection to others
- Proxy act as a gateway,

Monitoring Server

- Monitoring servers automatically scanning servers and network devices on the network for irregularities or failures

- It allows administrators to identify issues and fix unexpected problems before they impact end-user productivity

- Essential to ensuring network availability through proactive resolution of malfunctions and errors

Firewall

- Hardware or Software designed to permit or deny network transmissions based upon a set of rules and is frequently used to protect networks from unauthorized access while permitting legitimate communications to pass