Data Communication and Networking

The computer network

The computer network is a group of computers / devices( Nodes) that use a set of common communication protocols over a digital interconnections

For the purpose of sharing resources located on or provided by the network nodes

The nodes of a computer network may include personal computers, servers, networking hardware or other specialized or general purpose hosts

The interconnections between nodes are found from a broad spectrum of telecommunication networks technologies

A communication protocol is a set of rules for exchanging information over a network

The advantages/uses of a network

Simultaneous access

Shared peripheral devices

Personal communications

Easier data backup

VoIP (voice over internet protocol)

The networking devices (Nodes)

NIC Card

Repeater

Hub

Switch

Bridge

Router

Gateway

Firewall

Communication and protocols

Internet protocol suite

Also called TCP/IP is the foundation of all modern networking

It defines the addressing identification, and routing specifications for IPv4 and IPv6

It is the defining set for protocols of the internet

IEEE08

It is the family of IEEE standards dealing with LAN and metropolitan area networks

Wireless LAN

It is standardized by IEEE 802.11 and shared many properties with wires ethernet

SONET/SDH

Synchronous Optical Networking and synchronous digital hierarchy are standardizing multiplexing protocols that transfer multiple digital bit streams over long fiber cables

Overview of the web

Content (words and images)

Structure (HTML)

Style (CSS cascading style sheet)

Behaviour (JavaScript and server programs)

World wide web

Web Server: software that listens for webpage requests

Web browser: fetches/ displays documents from web servers (eg. Mozilla Firefox, Google Chrome, etc..)

THE INTERNET

It began as a US department defense network called ARPANET (1960s-70s)

Initial services electronic mail transfer file transfer opened to commencial interests in 80s

WWW created in 1989-91 by ™ Berners lee

Popular web browsers then netscape 1994 Internet explorer 1995

Key aspects of the internet

Subnetworks can stand on their own

Computers can dynamically join and leave the network

Built on open standards

Lack of centralized control

Everyone can use it with simple commonly available software

Internet protocol (IPv4 or IPv6)

A simple protocol for attempting to send data between two computers

Each device has a 32 or 128 bit IP address

Domain name system