CSC113a/COM113a Internet Services and Web Development

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Learning Objectives

* After completing this course learner will be able to :
  * Define the Internet and some standards related to it.
  * Describe Internet services
  * Understand basic terminologies related to Internet.
  * Identify the methods to connect to the Internet
  * Describe the web and it's terminologies
  * Build static web pages

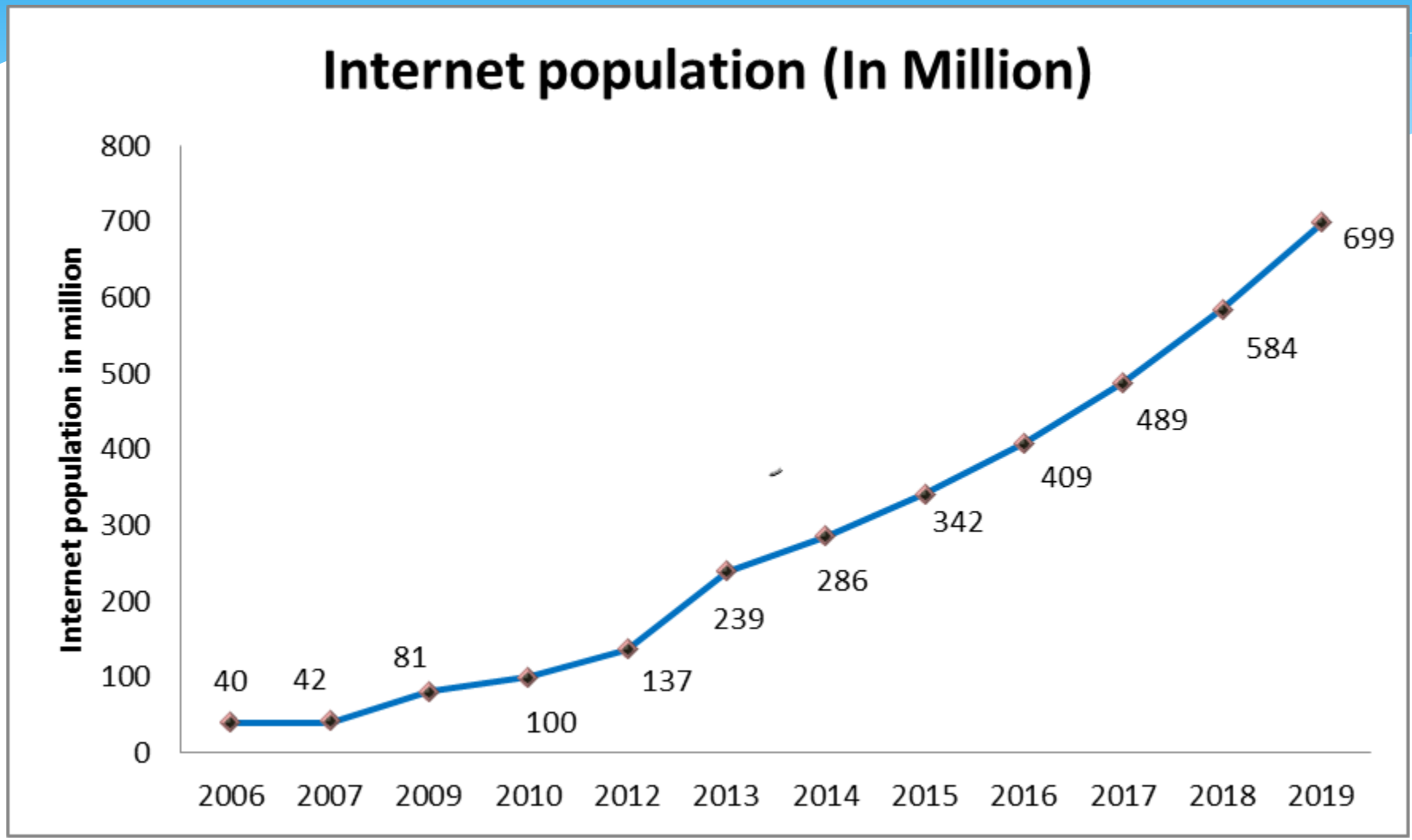
What is Internet?

* The Internet is a worldwide collection of computer networks
* The Internet is a network of networks that connects users in every country in the world. There are currently over one billion Internet users worldwide.
* The Internet is a global system of interconnected computer networks that use the standard Internet protocol suite (TCP/IP)

What is Computer Network?

* A computer network is a system in which multiple computers are connected to each other to share information and resources.
* Basically there are two types of computer networks:
  * Local Area Network (LAN)
  * Wide Area Network (WAN)

Growth of the Internet



History of Internet

* **1969** - ARPA (Advanced Research Projects Agency) goes online.
* **1972** - Electronic mail is introduced by Ray Tomlinson, a Cambridge, Mass.,computer scientist.
* **1973** - Transmission Control Protocol/Internet Protocol (TCP/IP) is designed and in 1983 it becomes the standard for communicating between computers over the Internet
* **1984** - Domain Name System (DNS) is established, with network addresses identified by extensions such as .com, .org, and .edu.
* **1989** - Tim Berners-Lee of CERN (European Laboratory for Particle Physics) developed World Wide Web.
* **1991** - Created Gopher, which provides point-and-click navigation & another indexing system, WAIS (Wide Area Information Server)

History of Internet ..

* 1998 - Google arrived.
* 2001 - Wikipedia created.
* 2003 - Skype released.
* 2004 - Facebook launched.
* 2005- YouTube launched.
* 2010- 4G wireless network

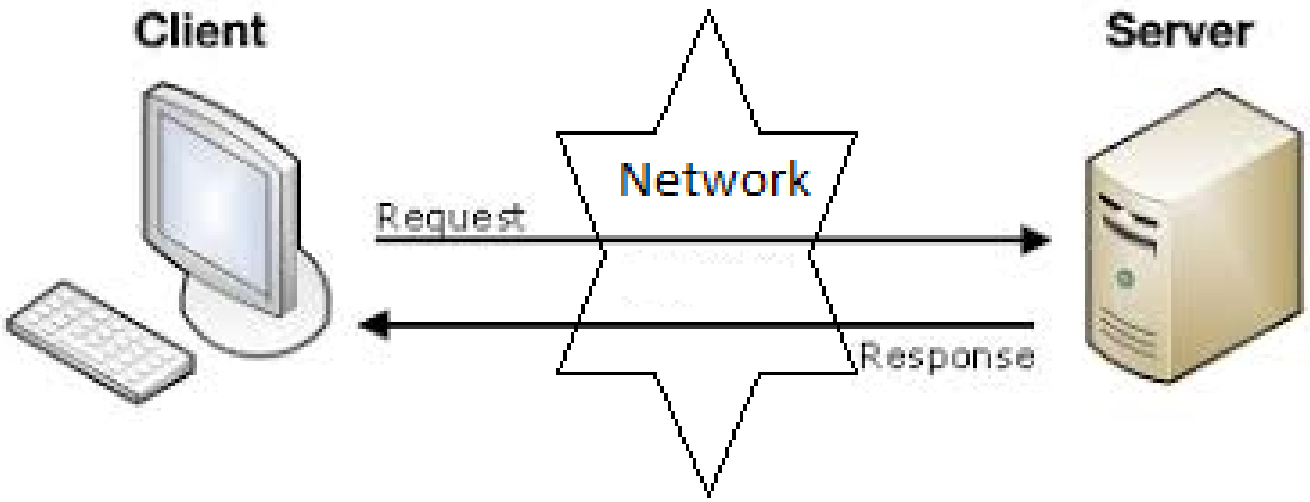
How Internet works

* Client Server Architecture
* Internet Protocols
* Internet Addressing

Client Server Architecture

* Computers on Internet uses client server architecture.
* Definition
  * *Client/server computing is a software engineering technique often used within distributed computing that allows two independent processes to exchange information through a dedicated connection following an established protocol.*

Client Server Architecture..



Client Server Architecture..

* Client
  * The Clients are the computers used to connect to the servers and request services
* Server
  * Servers are more powerful machines that provide services
  * Servers normally have faster processing power, more memory, larger storage capacity

Internet Protocol

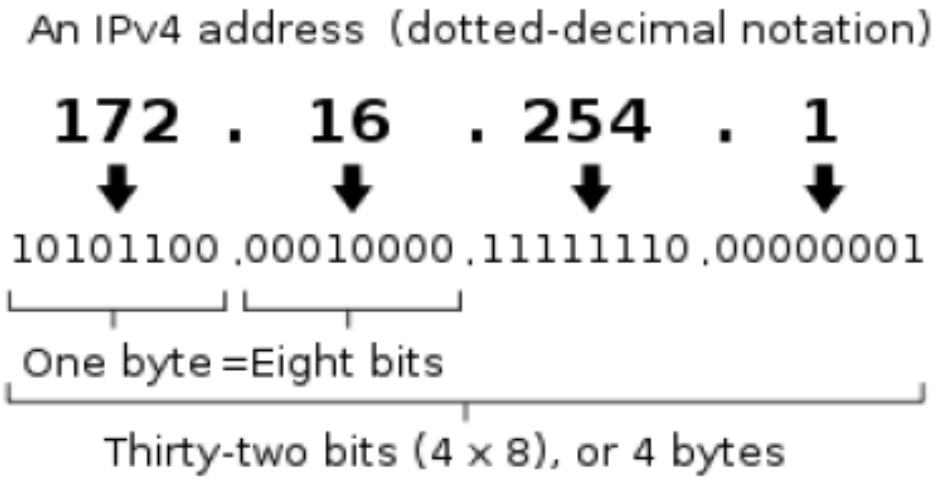
* The **Internet Protocol (IP)** is the method or protocol by which data is sent from one computer to another on the Internet.
* Each computer (known as a host) on the Internet has at least one **IP address** that uniquely identifies it from all other computers on the Internet.
* The communication protocol of the internet is **TCP/IP**
* Other Internet protocols like FTP, Gopher, and HTTP sit on top of **TCP/IP**.

TCP/IP

* TCP/IP is a family of protocols for communication between computers.
* **TCP/IP** stands for Transmission Control Protocol / Internet Protocol.
* It defines how electronic devices (like computers) should be connected over the Internet, and how data should be transmitted between them.

Internet Addressing

* **Internet Protocol Address**
* An Internet Protocol address(IP address) is a numerical label assigned to each device (e.g., computer, printer) participating in a computer network
* An IP number is a 32-bit binary number. (IPv4)



How to connect to the Internet

* **Modem/Dial-Up Connection**
  * The most common internet connection is the standard telephone line connection.
  * The rate of flow of information depends on the modem speed
  * The modem dials a telephone number given by the ISP (Internet service Provider)
* **Broadband Connection**
  * Design to give a business or residential user who required 24 hours Internet access a day
  * Expensive than dial-up connection.
  * Broadband operates from 10 to 20 times faster than a dial-up connection

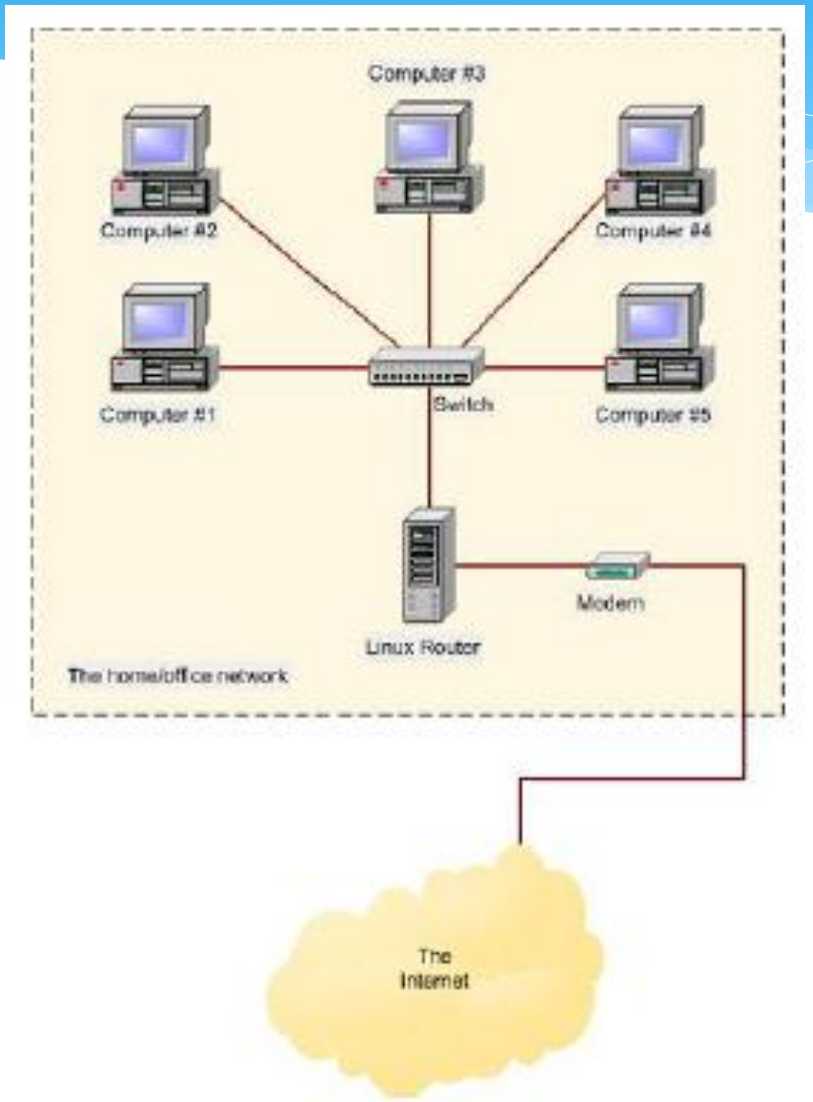
Dial –up Connection

* An Internet Service Provider (ISP)
* A computer
* A modem
* A telephone line

Broad Band Connection

* Broadband Internet service truly is the most used form of Internet access
* It is always faster than traditional dial up access
* Broadband includes several high-speed transmission technologies such as
  * Digital Subscriber Line (DSL)
  * Cable Modem
  * Fiber
  * Satellite

Broad Band Connection



Wireless Connections

* Wireless networks are computer networks that are not connected by cables of any kind.
* ireless networks use radio waves to connect devices such as laptops to the Internet, the business network and applications.

Internet Service Provider (ISP)

* An Internet Service Provider (ISP) is a company that provides you with access to the Internet, usually for a fee.
* The most common ways to connect to an ISP are by using a phone line (dial-up) or broadband connection (cable or DSL).
* Many ISPs provide additional services such as e-mail accounts, web browsers, and space for you to create a website.
* Examples for ISP
  * Sri Lanka Telecom
  * LEARN (Lanka Educational Academic & Research Network)
  * Eureka
  * Lanka Internet
* Services of ISP
  * Providing Internet access
  * Email
  * Web server space

Services of Internet

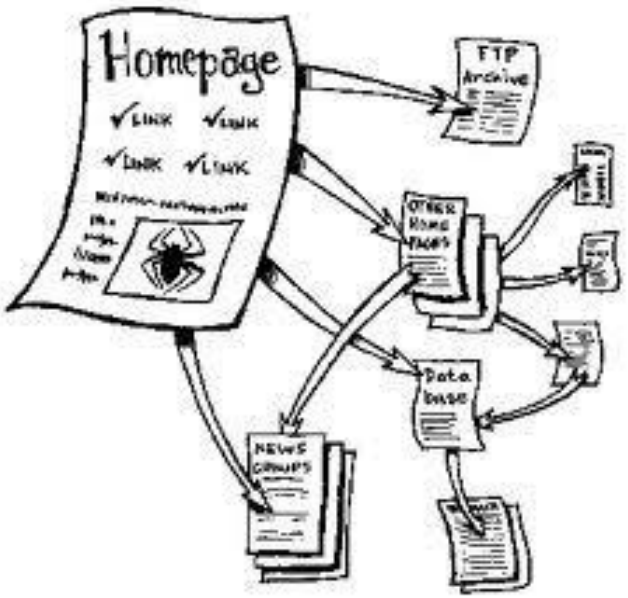
* Web
* Electronic Mail (E Mail)
* News Groups
* File Transfer Protocol (FTP)
* Internet Relay Chat (IRC)
* Voice/Video Communication –Skype
* Social Networks
* Search Engines
* Wikipedia

Question

* What is Internet and Web?
  * Same?
  * A Service?

World Wide Web

* Sir Tim Berners-Lee invented the World Wide Web in 1989.
* WWW is an open source information space where documents and other web resources are identified by URLs.
* Information in web are interlinked by hypertext links, and can be accessed via the Internet.



How does World Wide Web (WWW) works

* WWW uses the client/server approach
* The servers, which are on the web, are called web servers and clients are called web client
* Use HTTP (Hypertext Transfer Protocol) protocol
* HTTP is a standard communication protocol for sending and receiving HTML documents over the web

Web client

* A web client is a program capable of communicating with Web servers, requesting and receiving information from them, and processing it for display or other uses.
* A web browser is one kind of Web client.
* Translates HTML pages and image data into a nicely formatted on-screen display.
* Web Clients
  * Internet Explorer 
  * Firefox 
  * Google Chrome 
  * Safari

Web server

* A Web server is a system that delivers content or services to end users over the Internet.
* A Web server consists of a physical server, server operating system (OS) and software used to facilitate HTTP communication.
* • The main functionalities of web server software is accepting HTTP connections from web client and delivering web pages
* Web Server Software
  * Apache HTTP Server

  * Internet Information Services (IIS)