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Overview

Internet

ARPAnet

Advanced Research Project Agency – 1969four computers connected

NSFnet

National Science Foundation
Use of the Internet was originally limited to government, research and academic use.
1991 Commercial ban lifted

Intranet &Extranets

■ **Intranet**

  ■ A private network contained within an organization or business used to share information and resources among workers.

■ **Extranet**

  ■ A private network that securely shares part of an organization's information or operations with external partners

Growth of Internet

Year	Host Computers
1969	4
1989	100,000
1992	1,000,000
1995	8,000,000
2001	109,000,000
2002	147,000,000
2003	171,600,000
2006	439,000,000

The World Wide Web

The graphical user interface to information stored on some of the computers connected to the Internet

Internet Standards & Coordination

The Internet Society: A professional organization that provides leadership in addressing issues related to the future of the Internet

Web Standards and the W3C Consortium

■ W3C – World Wide Web Consortium

■ Develops recommendations and prototype technologies related to the Web

■ Produces specifications, called Recommendations, in an effort to standardize web technologies

Networ Overview

**Network** -- two or more computers connected together for the purpose of communicating and sharing resources
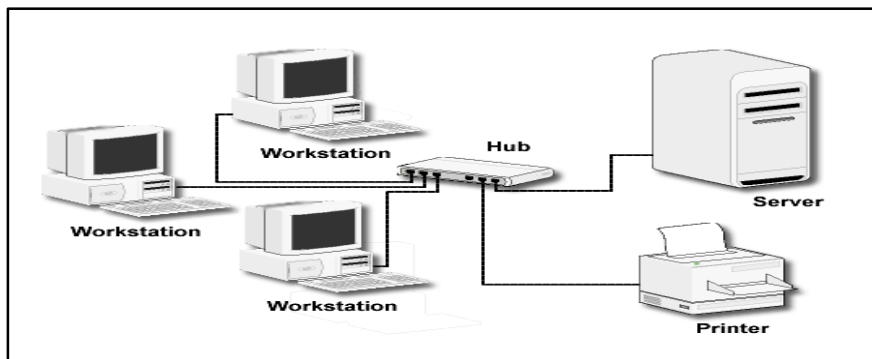
Networks Types

LAN -- **Local Area Network**: Usually confined to a single building or group of buildings

MAN -- Metropolitan Area Network: Connects computer resources in a local geographical area.

WAN -- Wide Area Network: Usually uses some form of public or commercial communications network to connect computers is widely dispersed geographical areas.

A WAN connecting two LANs
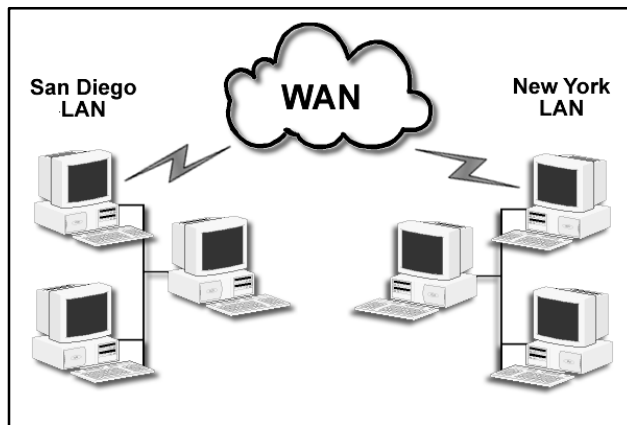
Internet Infrastructure
- **Internet Backbone**
  A high capacity communication link that carries data gathered from smaller links that interconnect with it.
- **NAP – Network Access Point**
  Access points or junctions to the Internet Backbone in major cities.

The Client/Server Model

Client/Server can describe a relationship between two computer programs – the "client" and the "server".
- **Client:** requests some type of service (such as a file or database access) from the server.
- **Server:** responds to the request and transmits the results to the client over a network
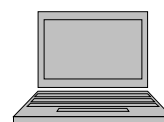
The Client/Server Model
- The Internet Client/Server Model
  - Client -- Web Browser
 - Server -- Web Server
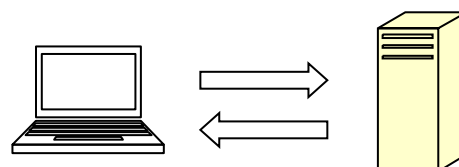
Web Client
- Connected to the Internet when needed
- Usually runs web browser (client) software such as Internet Explorer or Netscape
- Uses HTTP (Hypertext Transfer Protocol)
- Requests web pages from server
- Receives web pages and files from server

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Web Server
- Continually connected to the Internet
- Runs web server software (such as Apache or Internet Information Server)
- Uses HTTP (Hypertext Transfer Protocol)
- Receives request for the web page
- Responds to request and transmits status code, web page, and associated files
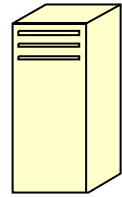
MIME Type
- **Multi-Purpose Internet Mail Extension:** a set of rules that allow multimedia documents to be exchanged among many different computer systems

Internet Protocols

- **Protocols:** Rules that describe the methods used for clients and servers to communicate with each other over a network.

There is no *single* protocol that makes the Internet and Web work.
A number of protocols with specific functions are needed.

FTP File Transfer Protocol
- A set of rules that allow files to be exchanged between computers on the Internet.
- Web developers commonly use FTP to transfer web page files from their computers to web servers.

FTP is also used to download programs and files from other servers to individual computers.
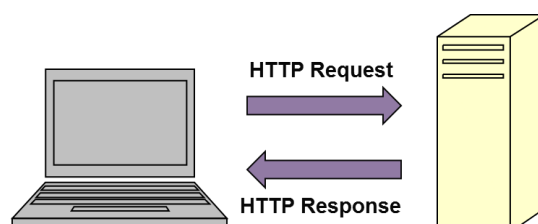
E-mail Protocols
- Sending E-mail
    - SMTP Simple Mail Transfer Protocol
- Receiving E-mail
    - POP (POP3) Post Office Protocol
    - IMAP Internet Mail Access Protocol

HTTP Hypertext Transfer Protocol
A set of rules for exchanging files such as text, graphic images, sound, video, and other multimedia files on the Web.

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- ■ Web browsers send HTTP requests for web pages and their associated files.
- ■ Web servers send HTTP responses back to the web browsers.

TCP/IP
Transmission Control Protocol / Internet Protocol

- ■ TCP/IP has been adopted as the official communication protocol of the Internet.
- ■ TCP and IP have different functions that work together to ensure reliable communication over the Internet.

TCP Transmission Control Protocol
- ■ Purpose is to ensure the integrity of communication
- ■ Breaks files and messages into individual units called packets
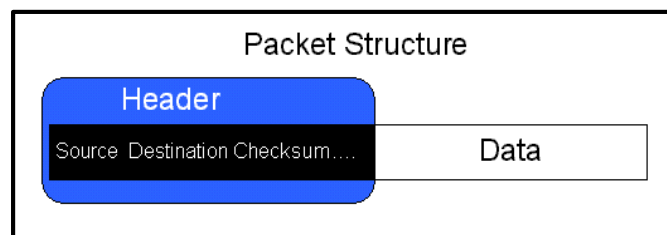

IP Internet Protocol
- ■ A set of rules that controls how data is sent between computers on the Internet.
- ■ IP routes a packet to the correct destination address.
- ■ The packet gets successively forwarded to the next closest router (a hardware device designed to move network traffic) until it reaches its destination.

IP Address
- ■ Each device connected to the Internet has a unique numeric IP address.
- ■ These addresses consist of a set of four groups of numbers, called octets.
   64.233.167.99 will get you Google!
- ■ An IP address may correspond to a domain name.

Domain Name
- ■ Locates an organization or other entity on the Internet
- ■ Domain Name System
    - ■ Divides the Internet into logical groups and understandable names
    - ■ Associates unique computer IP Addresses with the text-based domain names you type into a web browser

    - ■ **Browser: http://google.com**
    - ■ **DNS: 64.233.187.99**
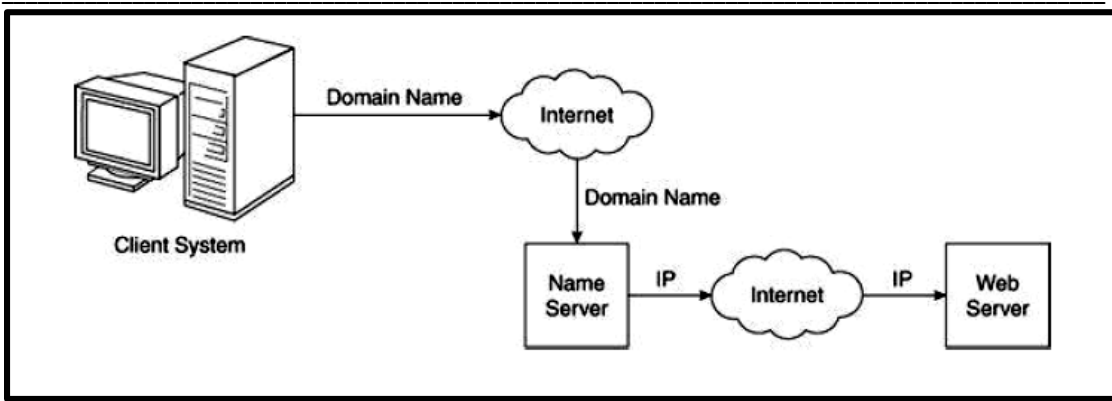
URL Uniform Resource Locator

Represents the address of a resource on the Internet.
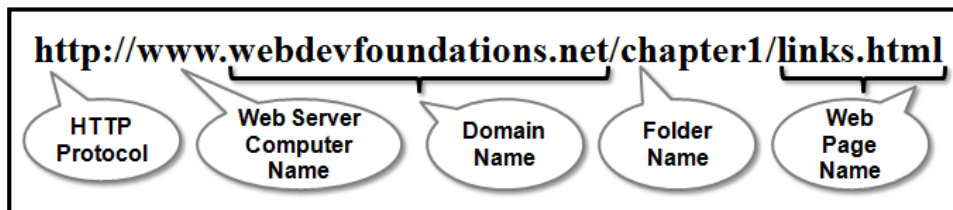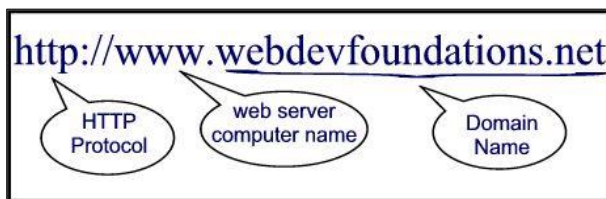
TLD Top-Level Domain Name

- A top-level domain (TLD) identifies the right-most part of the domain name.
- Current generic TLDs:
  .com, .org, .net, .mil, .gov, .edu, .int, .aero, .asia, .cat, .jobs, .name, .biz, .museum, .info, .coop, .pro, .travel

Counrty Code TLDs

- Two character codes originally intended to indicate the geographical location (country) of the web site.
- In practice, it is fairly easy to obtain a domain name with a country code TLD that is not local to the registrant.
- Examples: .tv, .ws, .au, .jp, .uk