BM 585 - Web-Based Technologies and Applications

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Topics to Be Covered

F Internet and Internet Services.

F Client/Server Technology.

F World Wide Web: Web browsers and Web servers.

F HTML, Perl, CGI, JavaScript, VBScript, Java, ActiveX, Plug-ins.

F Web Security and Commercial Applications.

The Internet

F The Internet is a computer network that connects millions of computers globally and provides world-wide communications to businesses, homes, schools, and governments.

History of the Internet

F During 1960s and 1970s many computer networking technologies were created:
  – Local Area Networks (via cables).
  – Wide Area Networks (via transmission lines).
  – The problem was that LANs and WANs were incompatible with each other/

F Roots of the Internet can be traced back to 1969:
  – DoD-funded ARPA conducted research on networking.
  – The goal was to design a network that allowed different types of computers on different types of networks to communicate with each other.

How Was It Achieved?

F A global network (i.e., the Internet) that interconnects different types of networks became possible by developing two new concepts:
  – routers : special computers that connect LANs and WANs of different types.
  – TCP/IP : A common protocol or a shared set of rules describing how to transmit data

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TCP/IP

F TCP/IP is the software used on the Internet to pass information from machine to machine and from network to network. It has two components:
  – IP (Internet Protocol) : helps to break up information into software packets that can move across networks
  – TCP (Transport Control Protocol) : works with the IP to guarantee that the information is transmitted correctly across the Internet. It makes sure that the
    ‣ packets are properly reassembled at the destination and
    ‣ lost and/or damaged packets are resent to the destination

IP Addressing

F Each computer on the Internet is assigned a unique numerical address, called its IP address.

F Every organization that will connect to Internet gets a set of IP addresses from an Internet authority.

F When two computers on the Internet needs to communicate, IP addresses of sender and destination computer are appended to packets, and routers determine the routes by looking at these addresses.

Servers and Clients

F The Internet is based on the client/server concept: Every computer program that communicates on the Internet is either a server or a client.

– A server offers service to other computers on the network (e.g., a file server).

– A client requests a service from a server.

F The client and server uses a common method for communicating and for passing the file from one machine to another, called a protocol.

Client/Server Interaction

F Example: Assume that a client would like to get a copy of a file stored on the file server across the Internet.

– The client program on the user's machine formats and sends the request to the file server.

– The server program locates the file on the server machine and sends a copy of it back to the client machine.

– The client program either saves it or opens it for immediate use.

Popular Services on the Internet

F FTP (File Transfer Protocol): transfers file from one computer to another.

F E-mail (Electronic Mail): is a kind of Internet based postal system that lets users send messages to each other.

F Bulletin Boards (Newsgroups, Discussion Groups): Participants post their messages, called articles, to a news server that store and let others read and respond to the messages.

F Gopher: is an Internet browsing service organized in a series of menus. Menu items can be files on local server or can point to other Gopher servers.

F World Wide Web

Intranets

F An intranet is a network that exists exclusively within an organization and that is based on Internet technology.

– may have thousands of users across many locations but still be private using firewalls.

– delivers an organization's information resources to each member's desktop quickly and inexpensively and also prevents the unauthorized access.

Uses of Intranets

F To give access to databases

F To distribute and upgrade software

F To distribute electronic documentation

F To provide a forum of discussions

F To offer online training

F To administer payrolls and benefits packages.

The World Wide Web

F The <u>World Wide Web (WWW)</u> is a graphical service that provides a network of interactive documents and the software to access them.

F WWW uses hyperlinks to locate and retrieve pages from WWW servers. A <u>hyperlink</u> is a connection or a hypertext link from a WWW page to another file on the WWW.

WWW Pages

F A <u>page</u> is the HTML-coded basic document of the WWW that combines text, graphics, sound, and software programs as a dynamic document.

F <u>HTML (HyperText Markup Language)</u> contains special <u>tags</u> or embedded commands that supply information about a page's structure, appearance and contents.

F A <u>Home Page</u> is the top-level, default page in a WWW site and usually contains an introduction to the Web site along with hyperlinks to other pages.

Web Browsers and Servers

F As other Internet services, the WWW is also based on clients and servers:

– A <u>Web client</u> or <u>browser</u> is a program that navigates the WWW, retrieves pages from servers on the Internet and displays pages.

– A <u>Web server</u> stores Web documents and sends them to a browser when requested. Web browsers and servers use communication rules called <u>HyperText Transfer Protocol (HTTP)</u>.

Common Gateway Interface (CGI)

F Web servers can also run CGI scripts based on requests from browsers.

F CGI scripts usually return some HTML for the Web browser to display.

F Example: User fills in a form on a page to register for a service, the form is processed by a CGI script that could:

– Enter user's name and other information into a database on the server

– Compose an HTML page that thanks the user by name for the information

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Hyperlinks

F A <u>hyperlink</u> is a connection from a World Wide Web page to another file on the World Wide Web.

– The destination of the hyperlink is mostly another WWW page, but it can also be a multimedia file or a program.

– A hyperlink is embedded directly in text or images of a page. Browsers usually underline text hyperlinks and display them in a specific color. Hyperlinked images change appearance when the pointer is over them.

Uniform Resource Locators (URLs)

F A <u>Uniform Resource Locator (URL)</u> gives the address of a file on the Web and also identifies the Internet service, such as FTP or the World Wide Web, that will handle the file.

F A URL has separate parts:
http**:**www.baskent.edu.tr/ceng/kd.html**#**students

– <u>Protocol:</u> tells the browser the Internet service that will handle the file. Examples include ftp, mailto, file, http.

– <u>Network Location:</u> A unique name that identifies an Internet server (e.g., www.baskent.edu.tr)

URLs (continued)

- <u>Path</u>: identifies the folders containing the file (e.g,ceng)
- <u>File name</u>: The file containing the page (e.g., kd.html)
- <u>Bookmark</u>: is a named set of zero or more characters on a page that can be target of a hyperlink. When a browser hyperlinks to a bookmark, it displays the page starting at the location of the bookmark (e.g.,students)

F A URL can be absolute or relative:

- <u>Absolute URL</u>: is the full Internet address of a page or file, including the protocol, network location, and optional path and file name.
- <u>Relative URL</u>: is a URL with one or more of its parts missing. The browser uses current page's parts to complete the URL.