



BM 585 - Web-Based Technologies and Applications

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Topics to Be Covered

- Internet and Internet Services.
- Client/Server Technology.
- World Wide Web: Web browsers and Web servers.
- HTML, Perl, CGI, JavaScript, VBScript, Java, ActiveX, Plug-ins.
- Web Security and Commercial Applications.



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The Internet

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



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History of the Internet

- 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/
- 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.



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How Was It Achieved?

- 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

- 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
 - lost and/or damaged packets are resent to the destination



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IP Addressing

- Each computer on the Internet is assigned a unique numerical address, called its **IP address**.
- Every organization that will connect to Internet gets a set of IP addresses from an Internet authority.
- 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.



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Servers and Clients

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



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Client/Server Interaction

- 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.



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Popular Services on the Internet

- **FTP (File Transfer Protocol)**: transfers file from one computer to another.
- **E-mail (Electronic Mail)**: is a kind of Internet based postal system that lets users send messages to each other.
- **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.
- **Gopher**: is an Internet browsing service organized as a series of menus. Menu items can be files on local server or can point to other Gopher servers.
- **World Wide Web**



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Intranets

- 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.



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Uses of Intranets

- To give access to databases
- To distribute and upgrade software
- To distribute electronic documentation
- To provide a forum of discussions
- To offer online training
- To administer payrolls and benefits packages.



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The World Wide Web

- The World Wide Web (WWW) is a graphical service that provides a network of interactive documents and the software to access them.
- WWW uses hyperlinks to locate and retrieve pages from WWW servers. A hyperlink is a connection or a hypertext link from a WWW page to another file on the WWW.



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13

WWW Pages

- A page is the HTML-coded basic document of the WWW that combines text, graphics, sound, and software programs as a dynamic document.
- HTML (HyperText Markup Language) contains special tags or embedded commands that supply information about a page's structure, appearance and contents.
- A Home Page is the top-level, default page of a WWW site and usually contains an introduction to the Web site along with hyperlinks to other pages.



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14

Web Browsers and Servers

- As other Internet services, the WWW is also based on clients and servers:
 - A Web client or browser is a program that navigates the WWW, retrieves pages from servers on the Internet and displays pages.
 - A Web server stores Web documents and sends them to a browser when requested. Web browsers and servers use communication rules called HyperText Transfer Protocol (HTTP).



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15

Common Gateway Interface (CGI)

- Web servers can also run CGI scripts based on requests from browsers.
- CGI scripts usually return some HTML for the Web browser to display.
- 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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16

Hyperlinks

- A hyperlink 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.



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17

Uniform Resource Locators (URLs)

- A Uniform Resource Locator (URL) 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.
- A URL has separate parts:
http://www.baskent.edu.tr/ceng/kd.html#students
 - Protocol: tells the browser the Internet service that will handle the file. Examples include ftp, mailto, file, http.
 - Network Location: A unique name that identifies an Internet server (e.g., www.baskent.edu.tr)



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18

URLs (continued)

- Path: identifies the folders containing the file (e.g.,ceng)
 - File name: The file containing the page (e.g., kd.html)
 - Bookmark: 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)
- A URL can be absolute or relative:
- Absolute URL: is the full Internet address of a page or file, including the protocol, network location, and optional path and file name.
 - Relative URL: is a URL with one or more of its parts missing. The browser uses current page's parts to complete the URL.

