

IT1208 WEB TECHNOLOGIES

Introduction to the World Wide
Web
and Web Technologies



Overview of the Module

- Introduction to the World Wide Web and Web Technologies
- Client side programming
- Server side programming using PHP
- Introduction to Web Server
- Server side database configuration and design using MySQL
- Web 3.0

Assessments

- Continuous Assessment 40%
- Final Examination 60%

References

- Internet & World Wide Web How to Program : 4th Edition By Deitel & Deitel
- www.w3schools.com

Learning Outcomes

- Define WWW
- Critic Internet
- Identify Web Fundamentals

What is the Internet?

- The Internet is a large system of interconnected networks that span the globe.
- Internet ready computers and personal digital assistants (e.g.: palm and pocket PCs, mobile phones, etc.) can access this network.
- The Federal Networking Council (FNC) defines the Internet more formally as the global information system that:
 - is logically linked together by a globally unique address space based on the Internet Protocol (IP) or its subsequent extensions/follow-ons



What is the Internet?

□ The Internet allows:

- Communication by e mail
 - The reading of on line newspapers, academic journals and books
 - The joining of discussion groups
 - Participation in simulations and games
 - Downloading of software, electronic books and music
 - Businesses to market and sell products and services (e commerce)
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- Internet responsible for the change of media news patterns
 - Lifestyle changes of millions of people
 - Social interaction
 - Habitual and attitudinal changes
 - Technophobia and Cyberphobia (going, going, gone...)

What is the World Wide Web?

- Commonly known as **WWW**. (Simply called as Web)
- The **World Wide Web** (WWW) was an Internet based hypertext project that allowed global information sharing.
- It is a way of exchanging information between computers on the internet.
- The resources of the Web can accessed by users from a software application called a **web browser** and are published by a software application called a **web server**.
- The WWW is based on two concepts:
 1. Hypertext
 2. A graphical user interface (a Web browser)



WWW History

- In 1990, Tim Berners Lee of CERN (the European Laboratory for Particle Physics) developed the World Wide Web (www) and several communication protocols that form the backbone of the web.
 - The www allows computer users to locate and view multimedia based documents (i.e., documents with text, graphics, animations, audios and/or videos) on almost any subject.
- Berners-Lee, In his book Weaving the web he developed three essential technologies:
 1. A system of globally unique identifiers for resources on the Web and elsewhere, the Universal Document Identifier (UDI), later known as Uniform Resource Locator (URL) and Uniform Resource Identifier (URI)
 2. The publishing language Hyper text Markup Language (HTML)
 3. The Hypertext Transfer Protocol(HTTP).

WWW History

- 1994 Mark Andreessen invents MOSAIC at National Center for Super Computing Applications (NCSA)
 - First graphical browser
 - Internet's first "killer app"
 - Freely distributed
 - Became Netscape Inc
- 1995 (approx.) Web traffic becomes dominant
 - Exponential growth
 - E-commerce
 - Web infrastructure companies
 - World Wide Web Consortium
- **Reference: "Web Protocols and Practice", Krishnamurthy and Rexford**

Brief History of the Internet

- The idea of a long distance computer network traces back to early 60's
 - Licklider at M.I.T.
 - National Physics Laboratory in U.K.
- In particular, the US Department of Defense was interested in the development of distributed, decentralized networks
 - survivability (i.e., network still functions despite a local attack)
 - fault tolerance (i.e., network still functions despite local failure)

contrast with phone system, electrical system

- In 1969, Advanced Research Project Agency funded the ARPANET
 - connected computers at UCLA, Stanford Research Institute (SRI), and University of Utah
 - allowed researchers to share data, communicate 56Kb/sec communications lines (vs. 110 b/sec over phone lines)

Growth of Internet

- Throughout the 70's, the size of the ARPANET doubled every year
 - e mail introduced in 1972
 - decentralization made adding new computers easy
 - ~1000 military & academic computers connected by 1984
- In 80's, U.S. government took a larger role in Internet development
 - created NSFNET for academic research in 1986
 - ARPANET was retained for military & government computers
- By 90's, Internet connected virtually all colleges & universities
 - businesses and individuals also connecting as computing costs fell
 - ~1,000,000 computers by 1992
- In 1992, control of the Internet was transferred to a non profit org

Internet Society: Internet Engineering Task Force, Internet Architecture Board, Internet Assigned Number Authority, World Wide Web Consortium (W3C)

Connecting to the Internet

- We access the Internet from home through an Internet service provider (ISP). An ISP connects to a regional network that is connected to a national network.
- At the office, a desktop computer might be connected to a local area network with a company connection to a corporate Intranet connected to several national Internet service providers.
- In general, small local Internet service providers connect to medium sized regional networks which connect to large national networks, which then connect to very large bandwidth networks on the Internet backbone.

Internet Connection Options

- Internet service providers (ISPs) provide several ways to connect to the Internet, including:
 - Voice grade telephone lines
 - Broadband connections
 - Leased lines
 - Wireless
- The major distinguishing factor is bandwidth (the amount of data that can be transferred per unit of time)

Bandwidth and Connections

- **Symmetric connection:** provides the same bandwidth in both directions
- **Asymmetric connections:** provide different bandwidths for either direction.
 - **Upstream bandwidth (upload bandwidth):**
The amount of information that can travel from the user to the Internet in a given amount of time.
 - **Downstream bandwidth (download or downlink bandwidth)**
The amount of information that can be transferred from the Internet to the user in an amount of time

Backbones

- Backbones, owned by large ISPs and telecom companies, are made up of:
 - High speed TCP/IP routers in a number of cities connected by
 - High speed data lines leased from long distance exchange carriers
 - Forming national “backbones” connecting those cities

WWW Components

❑ Structural Components

- **Clients/browsers:** to dominant implementations
- **Servers:** run on sophisticated hardware
- **Internet:** the global infrastructure which facilitates data transfer
- **Caches:** many interesting implementation

❑ Semantic Components

- Hyper Text Transfer Protocol (HTTP)
- Hyper Text Markup Language (HTML)
- eXtensible Markup Language (XML)
- Uniform Resource Identifiers (URIs)

Web Fundamentals

□ Client

A client is the requesting program in a client/server relationship.

Ex: the user of a Web browser is effectively making client requests for pages from servers all over the Web.

□ Server

A server is a computer program that provides services to other computer programs in the same or other computers.

Web Fundamentals

☐ Hypertext

It is text which contains links to other texts. The term was first coined by Ted Nelson around 1965.

☐ Hypermedia

This term used for Hypertext which is not constrained to be text. It can include video and sound.

☐ HTML (Hypertext Markup Language)

Web pages can be designed by HTML.

HTML is a tagging language used to compose documents that will be viewed by a web browser. It is a standard adopted so that no matter what computer platform someone is using, the web browser knows how to display the web document.

Web Fundamentals

□ Web Browser

The web client, called a browser, is the software that allows you to interact with information available on the Internet.

Ex: Netscape Navigator, Microsoft Internet Explorer, MOSAIC.



Web Fundamentals

□ Browser

- Implements HTTP (HyperTextTransfer Protocol)
 - Displays web pages
 - Access authentication
 - Caching, freshness control
- Font mapping (Ex: Unicode) <http://www.unicode.org/iuc/iuc10/xutf8.html>
- Compression, decompression
- Handles multimedia, manages plug-ins
- Interprets scripts
- Executes Java applets
- Maintains cache, history
- Manipulates cookies

Web Fundamentals

□Web Page

A mixture of text, graphics, sound and animation in the HTML format, to make information accessible in a easy to understand format using the Internet.

□Web Site

A collection of web pages connected (linked) by Hypertext clickable links.

□Web Site Storage/Hosting

After a web site is designed it must be stored on a computer that can be accessed through the Internet and the World Wide Web .

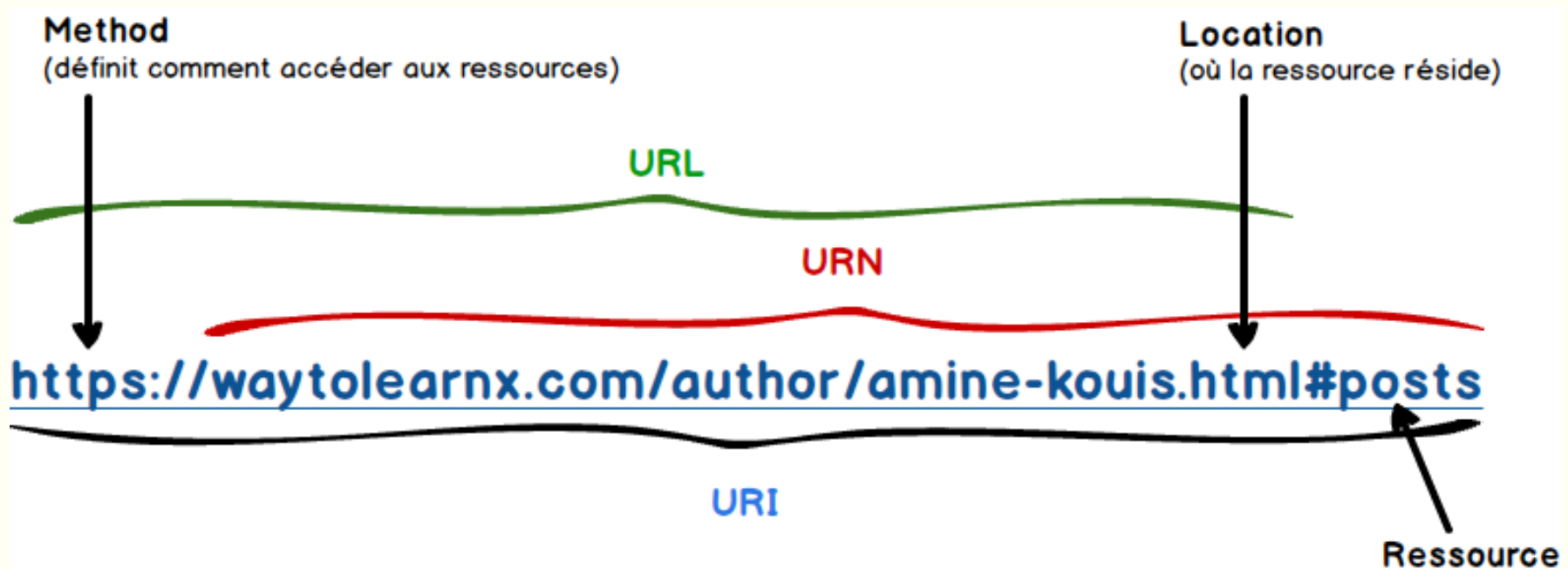
Web Fundamentals

□ URI (Uniform Resource Identifiers)

Unique identifier for web resources

Most popular form of a URI is the Uniform Resource Locator (URL)

URI = URL+URN



Web Fundamentals

□URL (Uniform Resource Locator)

These are the web addresses.

We type URL in address bar of the browser and enter then URL request a web page to the web server.

URL includes location as well as the protocol to retrieve the resource

□URN (Uniform Resource Name)

URN is also the subset of URI.

URN is completely different than URL as it doesn't include any protocol.

Web Fundamentals

☐ Bookmarks

Internet Bookmarks are stored URLs that can be retrieved.

In internet explorer bookmarks are saved link and also called as Favorites.

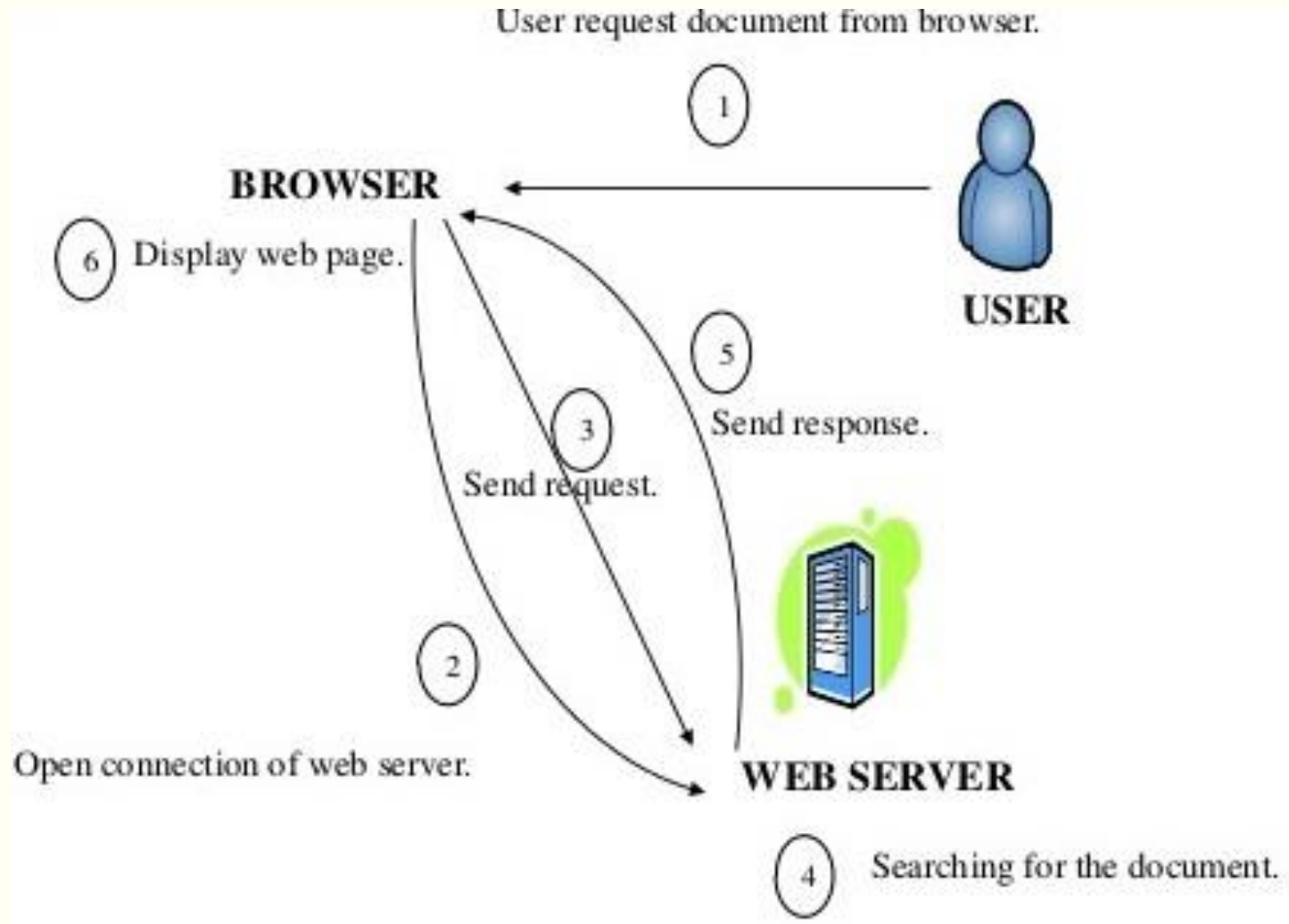
Internet Protocols

- The Web is one of several ways to retrieve information from the Internet. These different types of Internet connections are known as protocols.
- The different protocols governing the web are:
 - ✓ HTTP (Hypertext Transfer Protocol)
 - ✓ TCP/IP (Transmission Control Protocol/ Internet Protocol)
 - ✓ UDP (User Datagram Protocol)
 - ✓ FTP (File Transfer Protocol)
 - ✓ SMTP (Simple Mail Transfer Protocol)
 - ✓ POP3 (Post Office Protocol Version 3)

HTTP (HyperText Transfer Protocol)

- This used to access data on the WWW.
- Uses one TCP connection on well known port 80.
- Two types of HTTP messages: Request & Response
- Used to transport HTML pages from web servers to web browsers.
- Transfer data in the form of plain text, hypertext, audio, video and so on.

WWW Structure

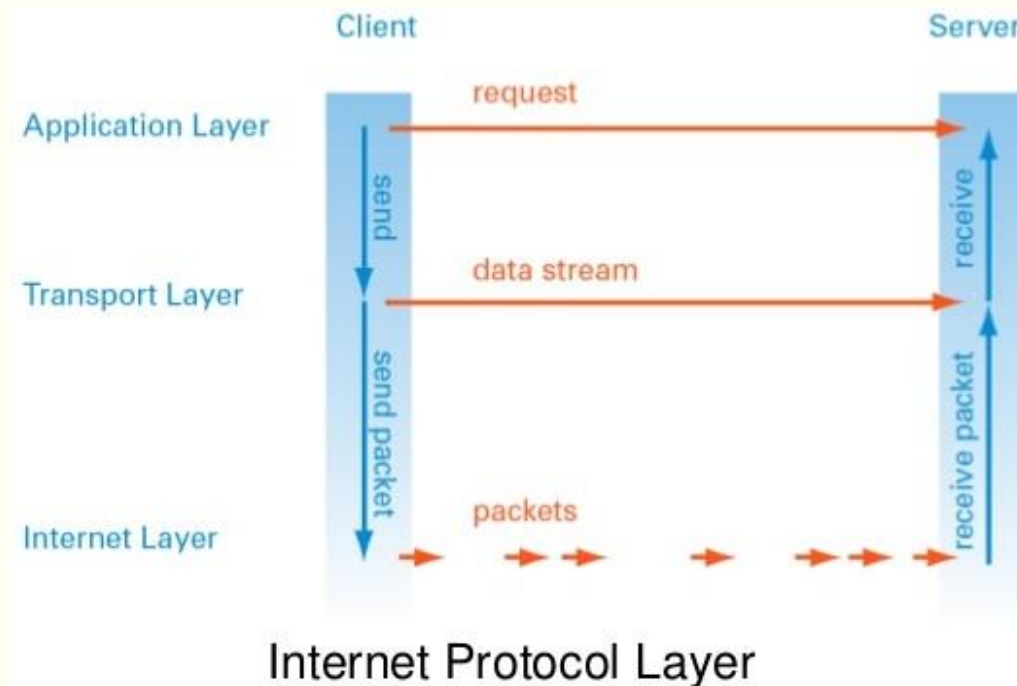


WWW Structure

- Clients use browser application to send URIs via HTTP to servers requesting a Web page
- Web pages constructed using HTML (or other markup language) and consist of text, graphics, sounds plus embedded files
- Servers (or caches) respond with requested Web page Or with error message
- Client's browser renders Web page returned by server
 - Page is written using Hyper Text Markup Language (HTML)
 - Displaying text, graphics and sound in browser
 - Writing data as well
- The entire system runs over standard networking protocols (TCP/IP, UDP, DNS,)

Fetching Pages over the Internet

- Architecturally, the Internet consists of a collection of layers, each one providing services for the one above it:
 - The Internet Layer gets packets to their destinations;
 - The Transport Layer sends streams of data;
 - The Application Layer provides high-level services to applications such as Web browsers.





THANK YOU

ANY Questions