Web Programming

Introduction and basic Concepts
Lecture 1

Text Book

HTML & Web Design Tips & Techniques Kris Jamsa

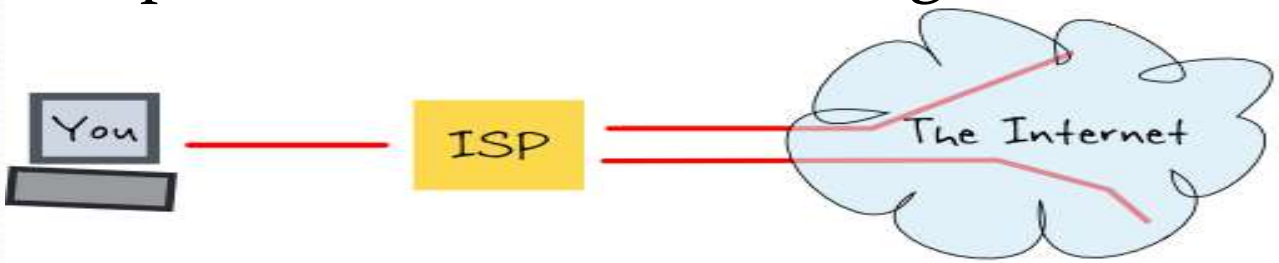
Internet & World Wide Web: How To Program, 5th Edition
by Deitel & Deitel

Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics
by Jennifer Niederst Robbins

HTML and CSS: Design and Build Websites
by Jon Duckett

What is the Internet?

- The internet is an enormous network of billions of connected computers and other hardware devices.
- Developed beginning in the 1960s, sponsored by ARPA (Dept. of Defense Advanced Research Projects Agency).
- Your computer connects to the Internet through a system of computers at your Internet Service Provider (ISP).
- The Internet has no centralized governance in either technological implementation or policies for access and usage.



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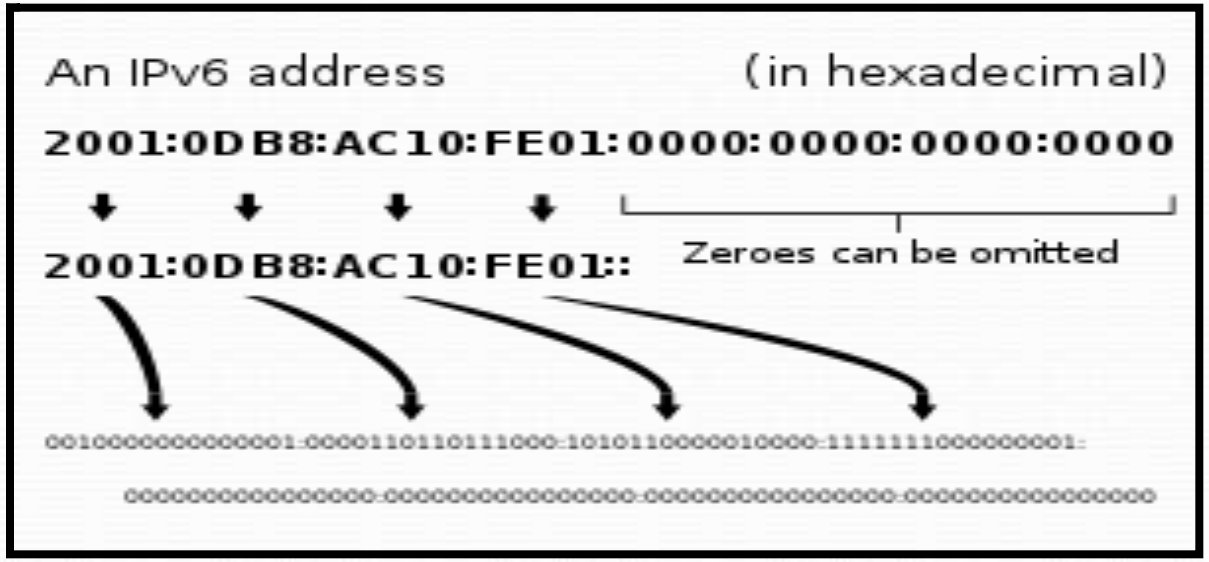
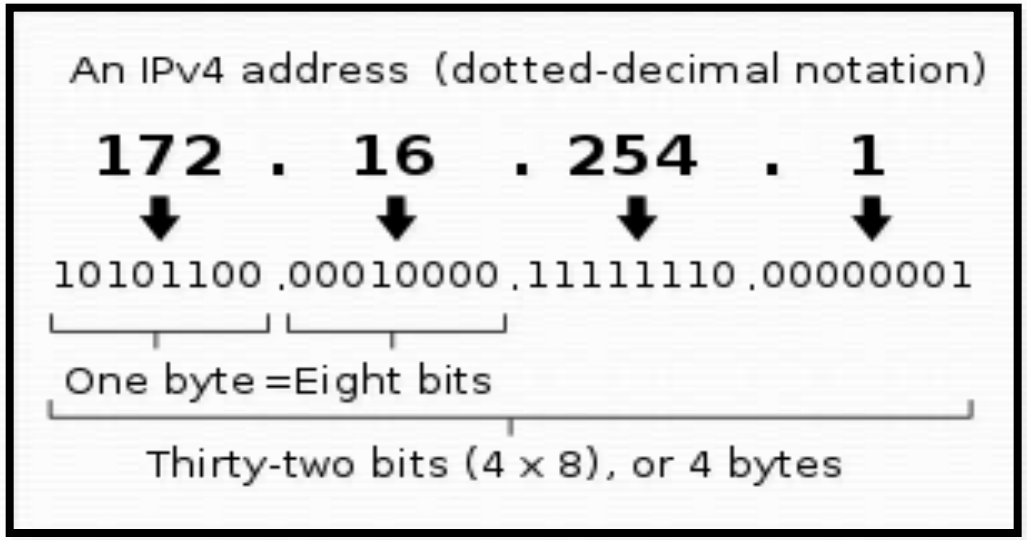
- The Internet Service Provider (ISP) connects to other networks of computers to provide you with access to the Internet
- The ISP provides a bridge between your computer and all the other computers in the world, which are all a part of the Internet.
- These standardized methods for transferring data or documents over a network are known as protocols.
- The ISP uses the TCP/IP (Transmission Control Protocol and the Internet Protocol) to make computer-to-computer connections possible and transmit data between them.
- When successfully connected to an ISP, you are assigned an IP address, which is a unique address given to your computer or network and allows it to be found while on the Internet.

IP Address (Internet Protocol address)

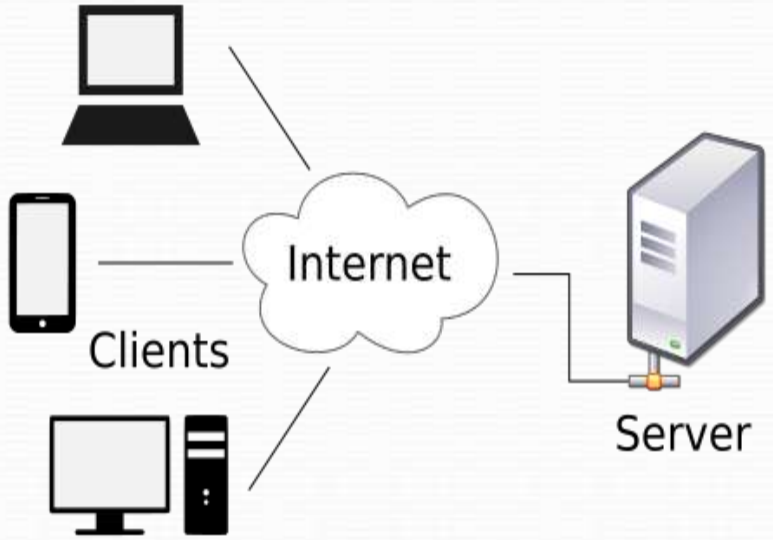
- Is a numerical label assigned to each device connected to a computer network.
- The IPv4 address has a size of 32 bits, which limits the address space to 4294967296 (232) addresses.
- In IPv6, the address size was increased from 32 bits in IPv4 to 128 bits, thus providing up to 2128 (approximately 3.403×1038) addresses.





Client-Server Architecture

- Each computer or process on the network is either a client or a server.
- Servers are powerful computers which provides a function or service to one or many clients, which initiate requests for such services.
- Clients are PCs or workstations on which users run applications. Clients rely on servers for resources , such as files , devices , and even processing power.



What is the Web?

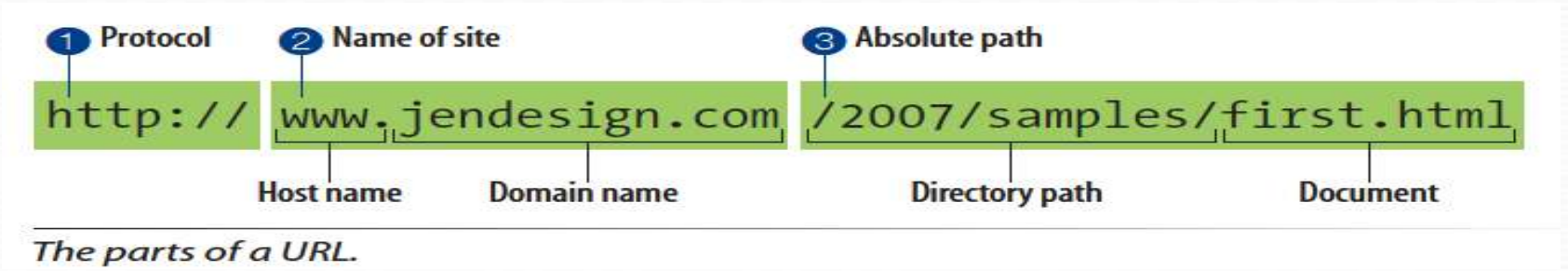
- The World Wide Web—usually called the Web for short—is a collection of different websites you can access through the Internet.
- A website is made up of related text, images, and other resources. Websites can resemble other forms of media—like newspaper articles or television programs—or they can be interactive in a way that's unique to computers.
- Web resources are identified by Uniform Resource Locators (URLs), interlinked by hypertext links, and can be accessed via the Internet

Hypertext Transfer Protocol (HTTP)

- Hypertext Transfer Protocol (HTTP) is the main access protocol of the World Wide Web. Web services also use HTTP to allow software systems to communicate in order to share and exchange business logic and data.
- HTTP is the protocol to exchange or transfer hypertext.
- Hypertext is structured text that uses logical links (hyperlinks) between nodes containing text.
- The client submits an HTTP request message to the server. The server, which provides resources such as Web pages and other content, or performs other functions on behalf of the client, returns a response message to the client. The response contains completion status information about the request and may also contain requested content in its message body.

Web Page Addresses (URLs)

- Uniform Resource Locator (URL) is a string of characters used to identify a resource.
- Each document in the internet has its own special address called a URL.
- A complete URL is generally made up of three components: the protocol, the site name, and the absolute path to the document or resource.



The parts of a URL.

- Many addresses do not include a file name, such as http://www.cnn.com
  Why?

More Advanced URLs

- anchor: jumps to a given section of a web page
- http://www.textpad.com/download/index.html#downloads
- fetches index.html then jumps down to part of the page labeled downloads
- port: for web servers on ports other than the default 80
- http://www.cs.washington.edu:8080/secret/money.txt

Organization Types

- .org : non-profit organizations
- .com : commercial hosts
- .net : network hosts
- .edu : educational institutions
- .int : international treaty organizations
- .gov : government agencies and organizations
- .mil : U. S. military

Ex. Protocols

- HTTP--Hypertext Transfer Protocol
  - Protocol for accessing World Wide Web documents
- FTP--File Transfer Protocol
  - Protocol for transferring files from one computer to another
- Telnet
  - Protocol that allows users to logon to a remote computer

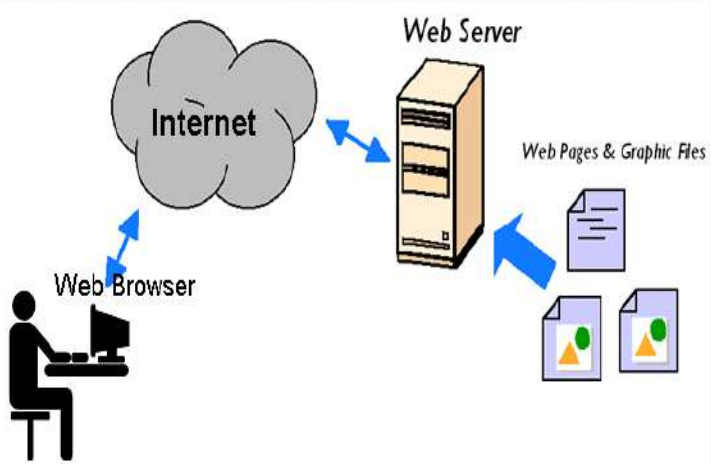
  - Any other protocols?

- Lec-2

• How the Web Works

Understanding the Roles of Web Browsers, Web Pages and Web Servers.

- A **Web page** consists of a series of HTML instructions that you can enter into a file using any text editor.
- **Web browsers** such as Internet Explorer follow the instructions in the text document you create to display the Web page content onscreen.
- A Web page you create using HTML should be viewable by anyone with a computer, any Web browser, and access to the Internet.
- A **web server** is a computer system that processes requests via HTTP, the basic network protocol used to distribute information on the World Wide Web.
- Web servers and Web browsers use the HTTP Protocol to communicate.



Web Browser Software

- The purpose of a web browser (Chrome, IE, Firefox, Safari) is to read HTML documents and display them.
- The browser does not display the HTML tags, but uses them to
- determine how to display the document.

Web browser software:

- Internet Explorer
- Firefox
- Opera
- Safari
- Chrome
- UC Browser

Web Browsers

- The <!DOCTYPE> Declaration

  The <!DOCTYPE> declaration helps the browser to display a web page correctly.

  There are different document types on the web.

  To display a document correctly, the browser must know both type and version.

  The doctype declaration is not case sensitive. All cases are acceptable.
- Write HTML Using Notepad or TextEdit
- HTML can be edited by using a professional HTML editor like:

  Adobe Dreamweaver

  Microsoft Expression Web

  CoffeeCup HTML Editor

Server-side

5. HTTP server sends the web document.

6. Your browser receives the document.

7. Your browser processes the source code.

8. The browser displays the web page.

4. HTTP server looks up the web document.

3. HTTP server receives the request from the browser.

2. Browser contacts the HTTP server at that address.

1. You type a www address into the browser.

Client-side

Connection Speed

- a web page is published over a network, and it needs to go zipping through the lines as little bundles of data before it reaches the end user. In most cases, the speed of that connection is a mystery.
- On the high end, folks with T1 connections, cable modems, ISDN, and other
- high-speed Internet access may be viewing your pages at a rate of up to 500KB per second.
- The percentage of people accessing the Web with broadband connections is steadily increasing. As of this writing, roughly 70% of Internet users in the United States access the Internet via broadband , and it is steadily climbing.
- That percentage rises to 90% in the U.S. workplace. The remaining 30% are dialing in with modems whose speed can range from 56 Kbps to as slow as 14.4 Kbps. For these users, data transfer rates of 1 KB per second are common.

- *There are other factors that affect download times, including the speed of the server, the amount of traffic it is receiving when the web page is requested, and the general congestion of the lines.*

Coping with unknown connection speed golden rules of web design:

- **Keep your files as small as possible.** It should be fairly intuitive that larger amounts of data will require more time to arrive. One of the worst culprits for hogging bandwidth is graphics files, so it is especially important that you spend time optimizing them for the Web.
- **Know your audience.** In some cases, you can make assumptions as to the connection speeds of your typical users. For example, if you are creating a video sharing site, you can optimize the site for performance over high-bandwidth connections. Because most people have access to high-bandwidth Internet in the workplace, you may be a bit more lenient on file sizes for sites with a professional audience. However, if your site is aimed at consumers or the classroom, be especially frugal with your byte count.

Editing HTML

- Written in source-code using text editor
- TextPad is a simple and inexpensive plain-text
- This tool includes shortcuts, templates, and even wizards for more complex web page authoring.
- It supports tabbed editing, which allows working with multiple open files in a single window HTML files .htm or .html extensions
- Name your files to describe their functionality.
- File name of your home page should be index.html