WEB DEVELOPMENT & DESIGN FOUNDATIONS WITH HTML5
7TH EDITION

Chapter 1
Key Concepts
REASONS FOR INTERNET GROWTH IN THE 1990S

- Removal of the ban on commercial activity
- Development of the World Wide Web by Tim Berners-Lee at CERN
- Development of Mosaic, the first graphics-based web browser at NCSA
- Personal computers were increasingly available and affordable
- Online service providers offered low-cost connections to the Internet
THE WORLD WIDE WEB

The graphical user interface to information stored on computers running web servers connected to the Internet.
INTERNET STANDARDS & COORDINATION

- ICANN - The Internet Corporation for Assigned Numbers & Names
  - Non-profit organization
  - Main function is to coordinate the assignment of:
    - Internet domain names
    - IP address numbers
    - Protocol parameters
    - Protocol port numbers.
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
  - WAI – Web Accessibility Initiative
WEB ACCESSIBILITY

- Accessible Website
  - provides accommodations for individuals with visual, auditory, physical, and neurological disabilities

- WAI
  - W3C’s Web Accessibility Initiative
    - http://www.w3.org/WAI

- WCAG
  - Web Content Accessibility Guidelines
    - http://www.w3.org/WAI/WCAG20/quickref/
Americans with Disabilities Act (ADA)
- Prohibits discrimination against people with disabilities

Section 508 of the Rehabilitation Act
- Requires that government agencies must give individuals with disabilities access to information technology that is comparable to the access available to others
- [http://www.section508.gov](http://www.section508.gov)
Universal Design

the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design

http://www.ncsu.edu/www/ncsu/design/sod5/cud/about_ud/about_ud.htm
Network

two or more computers connected together for the purpose of communicating and sharing resources
NETWORKS

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

- **WAN** – Wide Area Network
  - Usually uses some form of public or commercial communications network to connect computers in widely dispersed geographical areas.
INTERNET INFRASTRUCTURE

- **Internet Backbone**
  A high capacity communication link that carries data gathered from smaller links that interconnect with it.

- **Maps of the Internet Backbone**
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**
    - fulfills the request and transmits the results to the client over a network.
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 Firefox)
- Uses HTTP (Hypertext Transfer Protocol)
- Requests web pages from server
- Receives web pages and files from server
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
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.

- Web browsers send HTTP requests for web pages and their associated files.

- Web servers send HTTP responses back to the web browsers.
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.
- 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.

http://visualroute.visualware.com/
http://www.tracert.com/cgi-bin/trace.pl
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.

74.125.225.78 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
    - IP Address: 74.125.225.78
UNIFORM RESOURCE IDENTIFIER

- **URI – Uniform Resource Identifier**
  - identifies a resource on the Internet

- **URL – Uniform Resource Locator**
  - a type of URI which represents the network location of a resource such as a web page, a graphic file, or an MP3 file.

http://www.webdevbasics.net/chapter1/index.html
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, .mobi, .museum, .info, .coop, .post, .pro, .tel, .travel, .xxx
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
- See [http://www.iana.org/cctld/cctld-whois.htm](http://www.iana.org/cctld/cctld-whois.htm)
The Domain Name System (DNS) associates Domain Names with IP addresses.

Web Browser uses TCP/IP to send HTTP requests to a Web Server. The DNS translates domain names into IP addresses. The Web Server uses TCP/IP to send HTTP responses with web page files and images. The Web Browser displays the web page.
MARKUP LANGUAGES

- **SGML – Standard Generalized Markup Language**
  - A standard for specifying a markup language or tag set

- **HTML – Hypertext Markup Language**
  - The set of markup symbols or codes placed in a file intended for display on a web browser.
MARKUP LANGUAGES (2)

XML – eXtensible Markup Language

- A text-based language designed to describe, deliver, and exchange structured information.

- It is not intended to replace HTML – it is intended to extend the power of HTML by separating data from presentation.
MARKUP LANGUAGES (3)

- **XHTML – eXtensible Hypertext Markup Language**
  - Developed by the W3C as the reformulation of HTML 4.0 as an application of XML.
  - It combines the formatting strengths of HTML 4.0 and the data structure and extensibility strengths of XML.
MARKUP LANGUAGES (4)

- HTML 5
  - The next version of HTML4 and XHTML
  - http://www.w3.org/html/
POPULAR USES OF THE INTERNET

- Continued importance of E-Commerce
- Mobile Access
- Blogs
- Wikis
- Social Networking
- RSS
- Podcasts
- Web 2.0
- Cloud Computing