Introduction to CPSC 1030, Internet, and WWW

Course Objectives

- After this course, you should be able to

  - Develop web pages with text and graphics using HTML5 and Cascade Style Sheets.
  - Link web pages to form a website, test and publish a website.
  - Administer a website on a PC, or on a web server, or using a web hosting service.
  - Identify networking and security issues that relate to web hosting.
  - Apply scripting to create simple interactive web pages.

Textbook

Web Development and Design Foundations with HTML5, 10th Edition Terry Felke-Morris

Tentative Covered Topics

Week	Lecture Topic	Tasks	Quizzes and Exams
1	Introduction to the Internet and the WWW	Lab 1	Quiz 1
2	Web and HTML, HTML Basics	Lab 2	Quiz 2
3	Configuring Color and Text with CSS	Lab 3	Quiz 3
4	Visual Elements and Graphics	Lab 4	Quiz 4
5	Web Design	Lab 5	Quiz 5
6	Page Layout		Midterm 1
7	Page Layout, Links, Mobile	Lab 6	Quiz 6
8	Tables, Forms	Lab 7/Project	Quiz 7
9	Web Development	Lab 8	Quiz 8
10	Web Multimedia and Interactivity	Lab 9/Project	Quiz 9
11	Web Promotion and Search Engine		Midterm 2
12	JavaScript and jQuery	Lab 10/Project	Quiz 10
13	Advanced Topics and Review	Project	

Labs	20%
Quizzes	16%
Midterm Exam One	14%
Midterm Exam Two	14%
Term Project	16%
Final Exam	20%
Total	100%

The exact course content, order of presentation, time frames and scheme may be altered from the left at the instructor's discretion.

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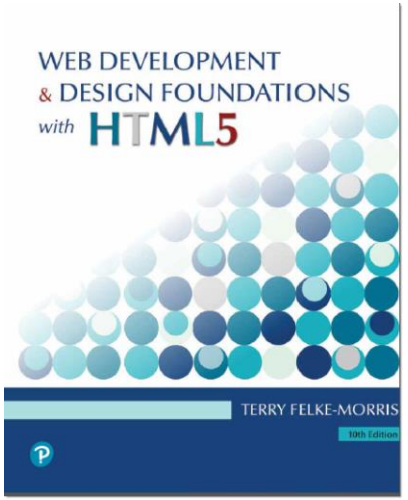

CHAPTER 1
INTRODUCTION TO THE INTERNET AND WORLD WIDE WEB

Internet

The interconnected network of computer networks that spans the globe.

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

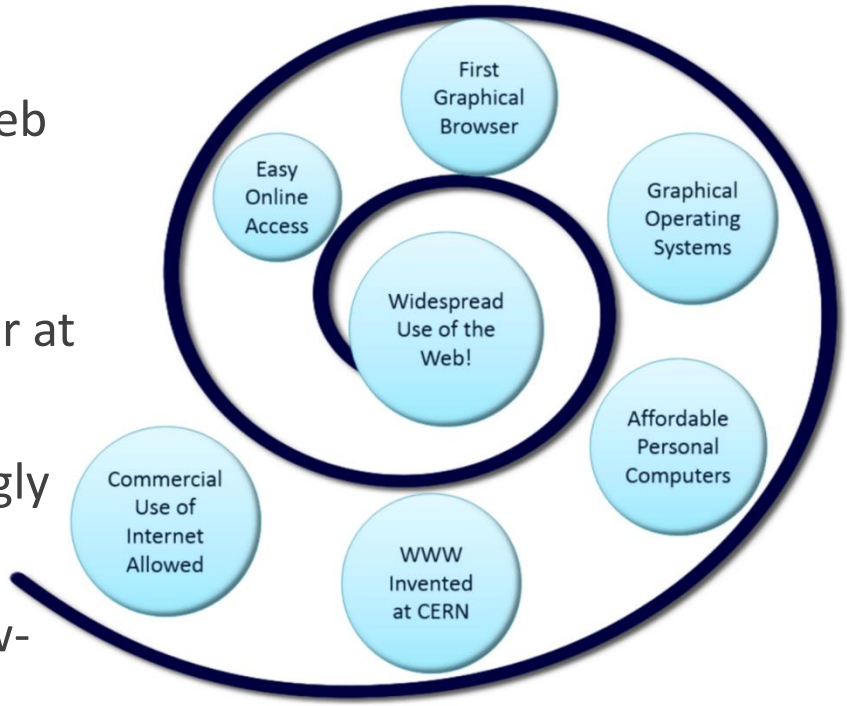

Figure 1.1

The World Wide Web

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

Internet Standards & Coordination

- **IETF** – Internet Engineering Task Force

  The principal body engaged in the development of new Internet protocol standard specifications.

- **RFC** – Requests for Comments

  A formal document from the IETF that is drafted by a committee and subsequently reviewed by interested parties

- **IAB** – Internet Architecture Board

  Provides guidance and broad direction to the IETF. Responsible for publications for RFCs.

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.

Growth of the Internet

Year	Percentage of Global Population Using the Internet
1995	0.4%
2000	5.8%
2005	15.7%
2010	28.10%
2015	45%
2018	55.1%
2019	56.1%

Source: http://www.internetworldstats.com/emarketing.htm

Intranet & Extranets

Intranet

- A private network contained within an organization or business used to share information and resources among coworkers.

Extranet

- A private network that securely shares part of an organization's information or operations with external partners

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 2.1

- Web Content Accessibility Guidelines
  http://www.w3.org/WAI/WCAG20/quickref/

Web Accessibility & The Law

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

Universal Design for the Web

Universal Design

strategy for making products, environments, operational systems, and services welcoming and usable to the most diverse range of people possible

https://www.dol.gov/odep/topics/UniversalDesign.htm

Figure 1.2

Reliability & Information on the Web

Questions to Ask:

- Is the organization credible?
- How recent is the information?
- Are there links to additional resources?
- Is it Wikipedia?

  If so, further research is needed.

Ethical Use of Information on the Web

- Is it acceptable to copy someone's graphic to use on your own website?
- Is it acceptable to copy someone's website design to use on your own site or on a client's site?
- Is it acceptable to copy an essay or code that appears on a web page and use it, or parts of it, as your own one?
- Is it acceptable to insult someone on your website or link to that person's site in a derogatory manner?
- Answer to all the question: **No!**

Checkpoint 1.1

1. *Describe the difference between the Internet and the Web.*

2. *Explain three events that contributed to the commercialization and exponential growth of the Internet.*

3. *Is the concept of universal design important to web developers? Explain your answer.*

Network Overview

Network

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

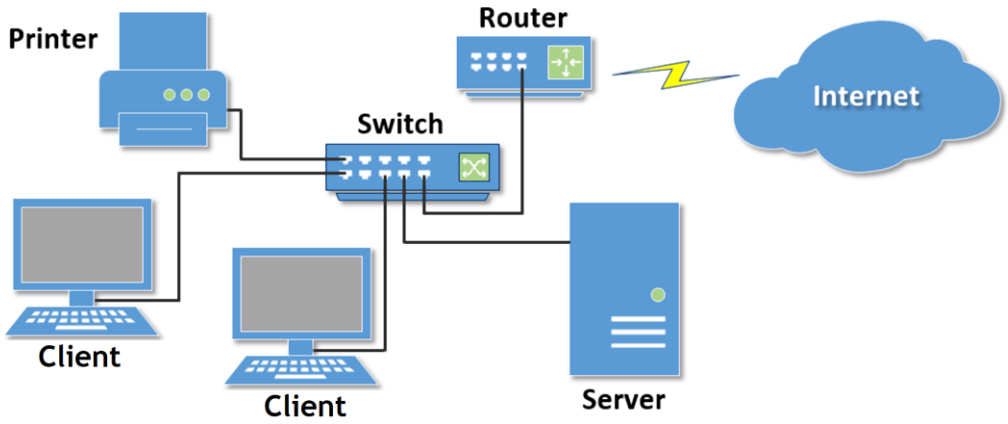

Figure 1.4

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 is 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

- http://www.google.com/search?q=global+internet+backbone+map+images

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

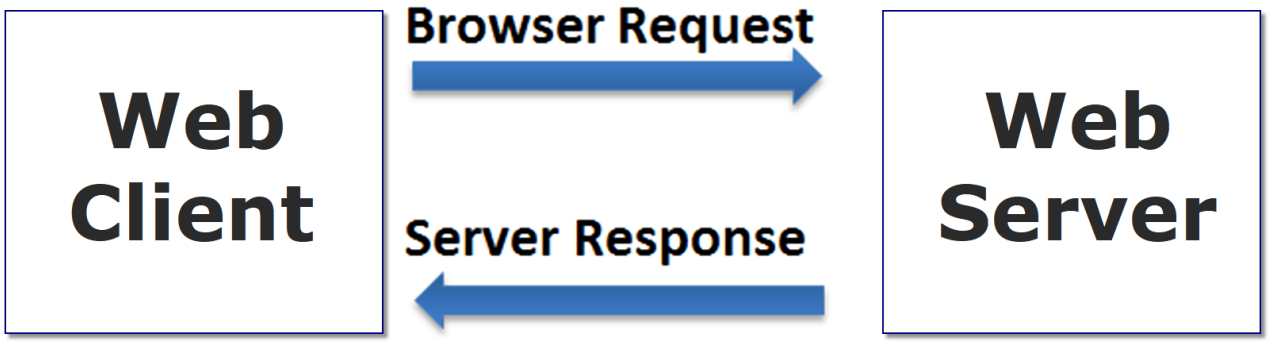

Figure 1.5

Web Client

Connected to the Internet when needed

Usually runs web browser (client) software
(*such as Microsoft Edge or Google Chrome)*

Uses HTTP (Hypertext Transfer Protocol) or HTTPS

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) or HTTPS

Receives request for the web page

Responds to request and transmits status code, web page, and associated files

MIME Type

Multi-Purpose Internet Mail Extension

- a set of rules that allow multimedia documents to be exchanged among many different computer systems

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.

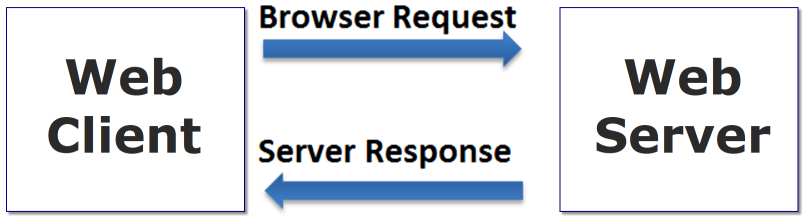

Figure 1.5

- Web browsers send HTTP requests for web pages and their associated files.
- Web servers send HTTP responses and the requested files back to the web browsers.

HTTPS – Hypertext Transfer Protocol Secure

Combines HTTP with a security and encryption protocol

TCP/IP

Transmission Control Protocol/ Internet Protocol

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.

TCP
Transmission Control Protocol

Purpose is to ensure the integrity of communication

Breaks files and messages into individual units called packets

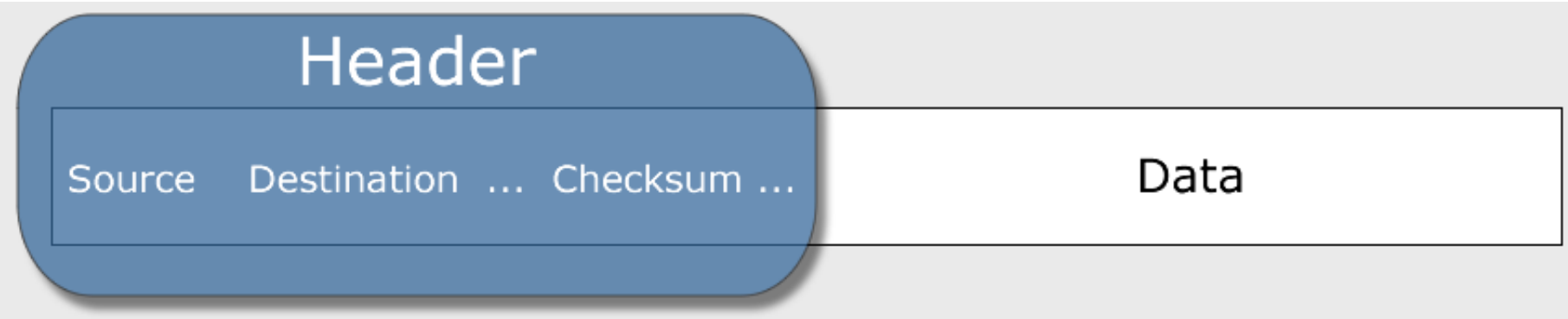

Figure 1.6

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.

IP Address

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.

216.58.194.46 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: 216.58.194.46

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.

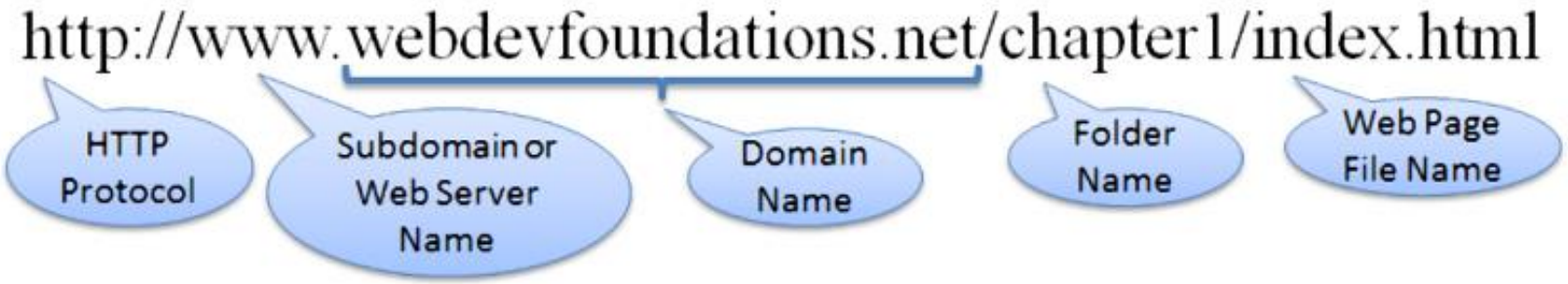

Figure 1.8

TLD
Top-Level Domain Name

A top-level domain (TLD) identifies the right-most part of the domain name.

Examples of generic TLDs:
.com, .org, .net, .mil, .gov, .edu, .int, .aero, .asia, .cat, .jobs, .name, .biz, .museum, .info, .coop, .post, .pro, .tel, .travel

County Code TLDs

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:

- .au, .jp, .uk

Domain Name System

The Domain Name System (DNS) associates Domain Names with IP addresses.

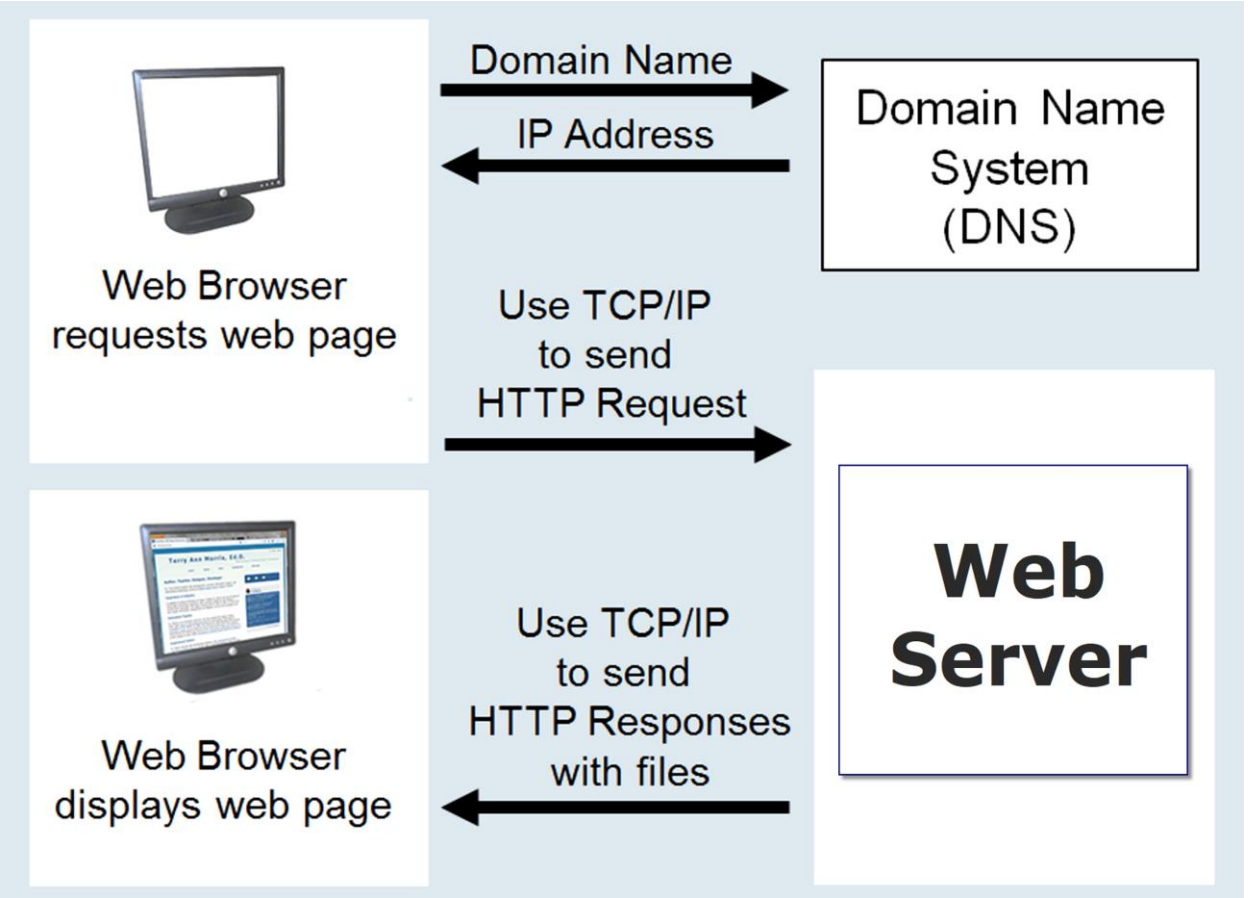

Figure 1.9

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
- https://www.w3.org/TR/html5/
- It's already been updated!

Checkpoint 1.2

1. *Describe the components of the client/server model as applied to the Internet.*

2. *Identify two protocols used on the Internet to convey information that use the Internet but do not use the Web.*

3. *Explain the similarities and differences between a URL and a domain name.*

Popular Uses of the Internet

- E-Commerce
- Mobile Access
- Blogs
- Wikis
- Social Networking
- RSS
- Podcasts
- Cloud Computing

Summary

This chapter provided a brief overview of Internet, Web, and introductory networking concepts.