

CPET 499/ITC 250 Web Systems

Lecture on HTML and XHTML, Web Browsers, and Web Servers

References:

- * Fundamentals of Web Development,” 2015 ed., by Randy Connolly and Richard Hoar, from Pearson
- *Chapter 2 of the Text Book: Programming the World Wide Web, 8th ed, by Robert W. Sebesta, from Pearson
- *Internet & World Wide Web How to Program, 5th ed, by Paul Deitel, et. al., From Pearson
- *Webmaster in a Nutshell, by Stephen Spainbour & Robert Eckstein, from O'Reilly
- *E-Book on Building Web Applications with HTML, 2012, by Paul I. Lin, http://www.etcs.ipfw.edu/~lin/CECourses/2_HTML/CE_02WebHhtmlindex.html

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Topics

- Introduction to HTML Documents
- Versions of HTML
- HTML5 Standards
- Topics on Web Browsers and Web Servers
- A Basic Web Site - Design

HTML Documents

■ HTML

- A structured language defines syntax and placement of WWW document for Web browsers.
- The HTML syntax contains definitions of tags and attributes that allows the separation of the presentation and structure of a document.
- It enables the creation of machine independent WWW documents.

■ References of HTML standards

- **HTML 5 W3C Recommendation, Oct. 28, 2014-**
<http://www.w3.org/TR/2014/REC-html5-20141028/>

Web Pages - HTML Documents

- A **Web page** normally includes text (content of the page) that mixed with "markup" tags for describing its structure, appearance, and function of the content.
- The HTML (**HyperText Markup Language**) language is a document-layout and hyperlink-specification language for encoding Web pages or documents, which may include text, image, and other supported media.

Web Pages - HTML Documents

- A **HTML web page** may include the following information
 - **Text** of its document with appropriate layout settings such as front, color, alignment, numbered and bulleted lists, etc; any **hypertext links** to other documents, images, and other media; tables and user feedback form
 - Embedded **client-side scripts** such as JavaScript
 - Embedded **images and media**
 - Embedded **other objects** such as Java Applet program, ActiveX, audio, video, and VRML objects
 - Embedded video, audio, and other formats via Plug Ins

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Evolution of HTML Specifications

- 1993 Original version of HTML was defined with SGML (Standard Generalized Markup Language)
- HTML 2.0 - 1995, HTML 3.2 - 1997
- HTML 4.0 - 1997, HTML 4.01 - 1999
<http://www.w3.org/TR/html4/>
- XHTML 1.0 - 2000
- XHTML2 Working Group, <http://www.w3.org/MarkUp/>
- Drop XHTML 2.0 development effort in 2009
- **HTML 5** - <http://www.w3.org/TR/2014/REC-html5-20141028/>

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HTML5 Semantics, Structure and APIs

- **HTML 5** – A vocabulary and associated APIs for HTML and XHTML
- **Documents** elements are defined by tags
 - **Opening tag**: `<name_of_the_tag>`
Document Contents
 - **Closing tag**: `</name_of_the_tag>`
 - **Comments**: `<!-- ..... -->`
- **Elements**
 - Content Models
 - Global Attributes

HTML5 Semantics, Structure and APIs

- HTML 5, <http://www.w3.org/html/wg/drafts/html/CR/>
- The Elements of HTML
 - The **root** element: `<html> </html>`
 - Document **Metadata**: `<head> </head>`, `<title> </title>`, `<base> </base>`, `<link> </link>`, `<meta> </meta>`
 - **Sections**: `<body>`, `<article>`, `<section>`, `<nav>`, `<aside>`, `<h1>`, `<h2>`, `<h3>`, `<h4>`, `<h5>`, `<h6>`, `<header>`, `<footer>`, `<address>`

HTML5 Semantics, Structure and APIs

- HTML 5, <http://www.w3.org/html/wg/drafts/html/CR/>
- The Elements of HTML (continue)
 - **Grouping** content: `<p>`, `<hr>`, `<pre>`, `<blockquote>`, `<ol>`, `<ul>`, `<li>`, `<dl>`, `<dt>`, `<dd>`, `<figure>`, `<figcaption>`, `<div>`, `<main>`
 - **Text-Level Semantics**: `<a>`, `<em>`, `<strong>`, `<small>`, `<s>`, `<cite>`, `<q>`, `<dfn>`, `<abbr>`, `<data>`, `<time>`, `<code>`, `<var>`, `<samp>`, `<kbd>`, `<sub>`, `<sup>`, `<i>`, `<b>`, `<u>`, `<mark>`, `<ruby>`, `<rb>`, `<rt>`, `<rtc>`, `<rp>`, `<dbi>`, `<bdo>`, `<span>`, `<br>`, `<wbr>`

HTML5 Semantics, Structure and APIs

- HTML 5, <http://www.w3.org/html/wg/drafts/html/CR/>
- The Elements of HTML (continue)
 - **Edits**: `<ins>` `<del>`
 - **Embedded contents**: `<img>`, `<iframe>`, `<embed>`, `<object>`, `<param>`, `<video>`, `<audio>`, `<source>`, `<track>`, `<map>`, `<area>`
 - **Links**: `<a>`, `<alternate>`, `<author>`, `<bookmark>`, `<help>`, `<icon>`, `<license>`, `<nofollow>`, `<noreferrer>`, `<prefetch>`, `<search>`, `<stylesheet>`, `<tag>`, `<next>`, `<prev>`

HTML5 Semantics, Structure and APIs

- HTML 5, <http://www.w3.org/html/wg/drafts/html/CR/>
- The Elements of HTML (continue)
 - **Tabular Data:** <table>, <caption>, <colgroup>, <col>, <tbody>, <thead>, <tfoot>, <tr>, <td>, <th>
 - **Forms:** <form>, <label>, <input>, <type>, <button>, <select>, <datalist>, <optgroup>, <option>, <textarea>, <keygen>, <output>, <progress>, <meter>, <fieldset>, <legend>, ...
 - **Scripting:** <script>, <noscript>, <template>, <canvas>

Standard XHTML Document Structure

- Every XHTML document must begin with:
<!DOCTYPE html>
<html>, **<head>**, **<title>**, and **<body>** are required in every document (in XHTML, not HTML)
- The whole document must have <html> as its root
- html must have the lang attribute:
<html lang = "en"> (this one is for English)
- A document consists of a head and a body
- The <title> tag is used to give the document a title,
- The meta tag is used to provide the character set used
<meta charset = "utf-8" />
- UTF-8: 8-bit Unicode Transformation Format or ASCII characters

Basic Text Markup

- Paragraph elements: <p> tag

```
<!DOCTYPE html>
<!-- welcome.html -->
<html lang = "en">
  <head>
    <title> Welcome to our Web site </title>
    <meta charset = "utf-8" />
  </head>
  <body>
    <p> Greeting from all of us!
  </p>
</body>
</html>
```

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welcome.html

- Microsoft Expression Web 4 – Web page authoring software

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-
transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
  <head>
    <meta content="text/html; charset=utf-8" http-equiv="Content-
    Type" />
    <meta content="en-us" http-equiv="Content-Language" />
    <title>Greeting from all of us</title>
  </head>
  <body>
    <p>Greeting from all of us</p>
  </body>
</html>
```

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URL for the Web Page: htmlstruc.html

http://www.etcs.ipfw.edu/~lin/CECourses/2_HTML/Lectures/3_HTMLBasics.html

```
<html>
<!-- htmlstruc.html
      Author:
      Version:
-->
<head>
<title> Basic html Document Structure/Template </title>
</head>
<body>
<!-- Contents of html Document -->
<h1> Basic html Document Structure/Template </h1>
</body>
</html>
```

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URL for the Web Page: htmlstruc.html

Structured Markup Tags (for overall document)

<u>Begin Tag</u>	<u>End Tag</u>	<u>Meaning</u>
<html>	</html>	Placed at the beginning and end of the document
<head>	</head>	Define the header portion
<title>	</title>	Define the title of the document
<body>	</body>	Define document body
<!--	-->	One line comment
<!-- This is a comment -->		

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Optional Elements

- **<base>** -- Establish the document base location
- **<meta>** -- Provide keywords, descriptions to search engines, and client pull functions
- **<link>** -- Link a document to another document or an external style sheet
- **<script>** -- Add JavaScripts and VBScripts
- **<style>** -- Add embedded style sheet

Base Tag Example,

http://www.etcs.ipfw.edu/~lin/CECourses/2_HTML/03HTMLBasicsExs/basehref.html

```
<html>
```

```
<!-- basehref.html -->
```

```
<title> BASE href testing </title>
```

```
<head>
```

```
  <base href="http://www.etcs.ipfw.edu/~lin/html/">
```

```
</head>
```

```
<body>
```

```
  <h1>
```

```
    <!-- The file "headers.html" is located in the <BASE  
         href="http://www.etcs.ipfw.edu/~lin/html/" -->
```

```
    <a href="headers.html"> Header Example
```

```
    <br>
```

```
  </h1>
```

```
</body> </html>
```

Web Browsers and Web Pages

- A web browser is a software application for retrieving, presenting, and traversing information resources on the World Wide Web, (source: https://en.wikipedia.org/wiki/Web_browser)
- The major web browsers are
 - Firefox, <https://www.mozilla.org/en-US/firefox/new/>
 - Internet Explorer (IE), <http://windows.microsoft.com/en-us/internet-explorer/download-ie>
 - Google Chrome, <http://www.google.com/chrome/index.html>
 - Opera, www.opera.com
 - Safari, <https://support.apple.com/downloads/safari>
 - dia.org/wiki/Web_browser

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Web Browsers

- 2016 Internet Browser Software Product Comparisons, <http://internet-browser-review.toptenreviews.com/>
- Mozilla Firefox – Gold Award
- Google Chrome
- Opera
- Safari
- Internet Explorer
- Torch

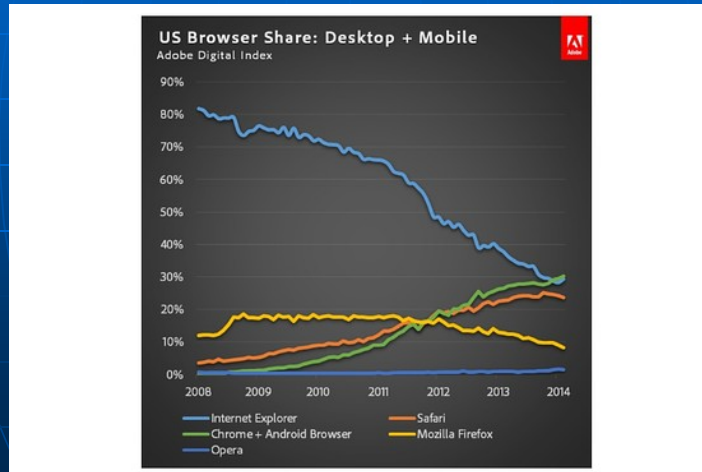
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Web Browsers and Web Server Market Shares

■ Web Browsers Market Share

- Google Passes Microsoft in U.S. Browser Market Share, <http://blogs.wsj.com/digits/2014/06/05/google-passes-microsoft-in-u-s-browser-market-share/>



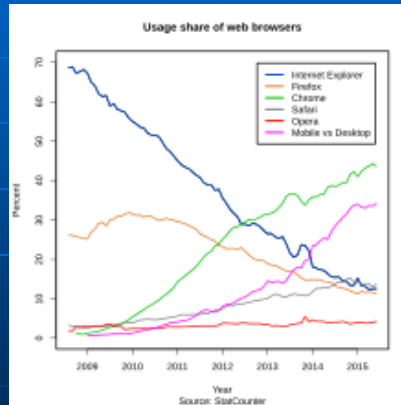
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Web Browsers

- 2016 Browser & Platform Market Share, <https://www.w3counter.com/globalstats.php>
- Chrome 58.1%
- Safari 12.7%
- Firefox 12.4%
- Internet Explorer & Edge 9.5%
- Opera 2.8%

Web Browsers and Web Pages

- StatCounter – Visitor analysis tool,
<https://statcounter.com/>



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Web Server Survey - Netcraft

- Feb. 2016 Web Server Survey,
<https://news.netcraft.com/archives/2016/02/22/february-2016-web-server-survey.html>
 - Apache (306,292,557, 32.80%)
 - Microsoft (278,693,041, 29.83%)
 - Nginx (137,459,391, 14.72%)
 - Google (20,640,058, 2.21%)

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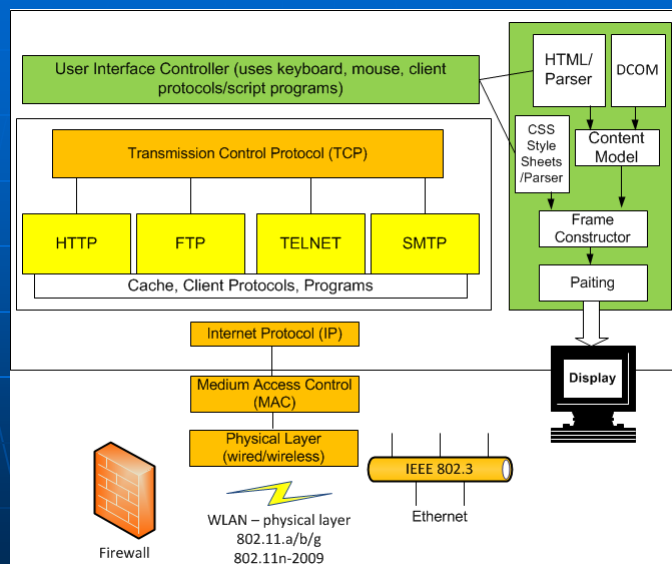
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Web Browsers and Web Server Market Shares

- Desktop Browser Version Market Share, Aug. 2016,
<https://www.netmarketshare.com/browser-market-share.aspx?qprid=2&qpcustomd=0>

- Chrome 52.0, 23.97%
- Microsoft IE 11, 17.74%
- Chrome 51.0, 10.55%
- Chrome 45.0, 5.72%
- ...

Web Browser and Supporting Protocols



Web Browsers and Web Pages

- HTML 5, <http://www.w3.org/html/wg/drafts/html/CR/>
- The **Window** object
 - The **WindowProxy** object
- Session History and Navigation
 - The **History** interface, The **Location** interface
- Web application APIs
 - The **ErrorEvent** interface
 - **Events**: **Document** objects and **Window** objects
 - **Dynamic markup insertion**: `document.write()`, `document.writeln()`
 - Timers
 - User prompts
 - System state and capabilities
 - User interaction

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Web Server Market Shares

- April 2014 Web Server Survey,
<http://news.netcraft.com/archives/2014/04/02/april-2014-web-server-survey.html>
- NetCraft May 2014 Web Server Survey,
<http://news.netcraft.com/archives/2014/05/07/may-2014-web-server-survey.html>
 - Microsoft threatening Apache's market lead
 - Total number of web sites
 - Web server developers: Market share of all sites
 - Web server developers: Market share of active sites
- Server Hardware Stat (4Q13),
<http://www.gartner.com/newsroom/id/2671315>
 - HP 28.1%, IBM 26.5%, Dell 15.2%, Cisco 4.7%, Oracle 4.2%, other Vendors 21.3%.

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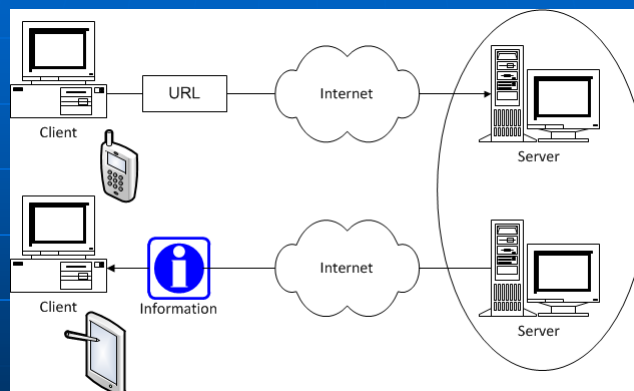
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Web Browsers Monitoring Tools

■ Employee Monitoring Software

- Program activity
- Screen shots
- Email/Webmail
- Document Tracking
- Websites visited
- Online Searches
- Chat/IM
- Detected Keywords
- Keystrokes
- Logon/Logoff

Web Client-Server Computing Model



Design & Build A Web Site

- **Web Site Design**
 - Types of Web Site: E-commerce, Business and Services, Topic sites, personal sites,
 - System requirements – Analysis Phase
 - Modular Design – Design Phase
 - Presentation tier, Business logic tier, Data tier
 - Web server
 - Apache, IIS (Microsoft Internet Information Server), IBM WebSphere
 - Application server
 - Database server
 - Application authoring and Programming Tools

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Software for Web Site Design

- HTML (HyperText Markup Language) Web page authoring
- XML (eXtensible Markup Language) page authoring
- Common Gateway Interface programming
- Generating and parsing HTML and XML
- Creating dynamic HTML pages
- HTTP clients and server Apps
- Web site management
- Databases and Apps
- Web applications

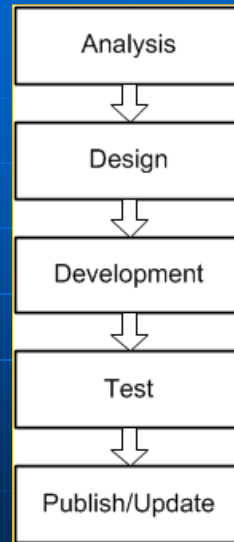
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Design & Build An E-Commerce Site

■ Web Site Design

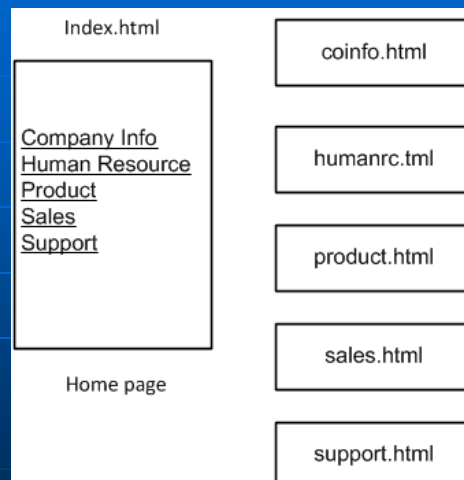
- Business and Services
- System requirements
- Modular Design
- Web server
- Database server
- Application server
- Programming Tools



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Design - A Company Web Site



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Summary

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