Introduction/Getting Started

CSE/ISE 102: Introduction to Web Design and Programming
Stony Brook University

1

What is the Web?

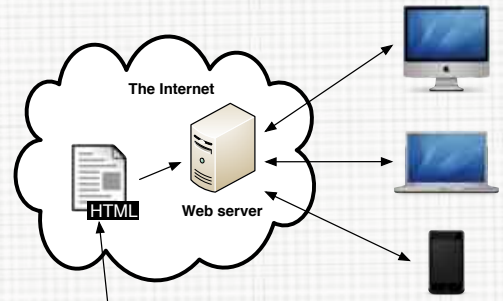
- A collection of machines connected to the Internet
  - Consist of servers that distribute documents (pages/files) and clients that request/retrieve those documents
- A set of protocols (standard communication formats)
  - TCP/IP
  - HTTP

2

A Brief History Lesson...

- 1989: The World Wide Web was created at CERN in Switzerland by Tim Berners-Lee and Robert Cailliau
  - The Web was text-only for its first few years
- 1992: NCSA Mosaic, the first graphical browser, is created, and the Web becomes visible to (and used by) the public at large
  - Total number of Web servers: about 50

3



Web pages are files written using **HTML** (Hypertext Markup Language) and saved on a computer called a Web server. The HTML in the page tells the Web browser how to display that page.

Any Web browser can retrieve your Web pages over the Internet from the Web server

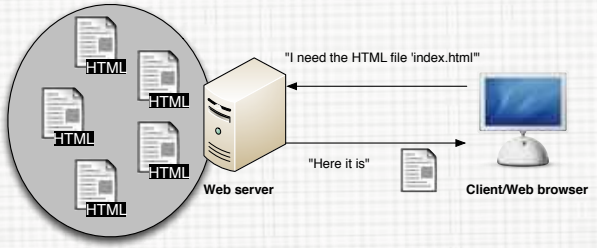
4

Servers vs. Browsers

- Web servers listen for requests from Web browsers
  - When a request comes in, the server finds the file (resource) and sends it back to the browser
- When the user clicks on a link in a Web browser, the browser requests an HTML page (or a file) from a Web server, retrieves it, and displays it

5

Web Server Overview



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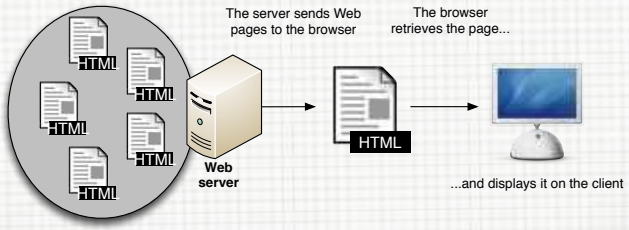
Web Browser Overview

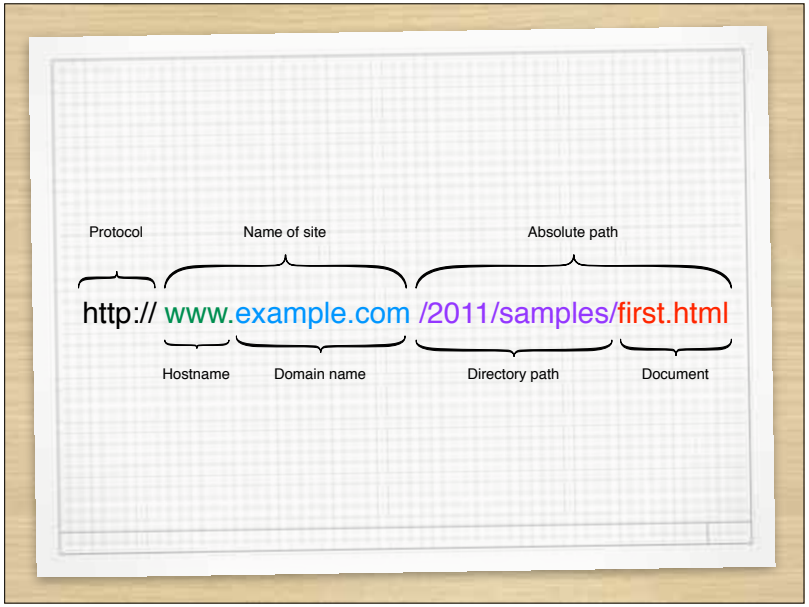


7

Web Page Addresses (URLs)

- A URL (Uniform Resource Locator) is the address of a page or resource on the Web
- A complete URL has three parts:
  - the protocol
  - the site name
  - the absolute path to the document/resource

8



9

The Art of Web Design

10

What Does a Web Designer Do?

- Design
  - User Experience, Interaction, and User Interface Design
  - Visual (Graphic) Design
- Development
  - Authoring/markup, Styling, Scripting/Programming
- Content Strategy and Creation
- Multimedia

11

Elements of Web Design

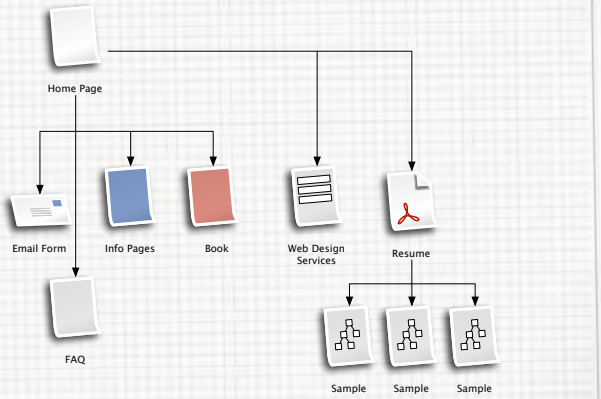
- Interaction design: makes the site easy and efficient to use
- User interface design: focuses on functional organization and tools (links, buttons, menus) that users use to do things
- User experience design: covers “all aspects of a user’s interaction with the product” (Norman)
  - visual design, user interface, quality of content, and site performance

12

Sample Design Documents

- User research/testing reports
  - interviews and observations, user testing
- Wireframe diagrams
  - shows the structure of a Web page using outlines
- Site diagrams
  - shows the site structure as a whole
- Storyboards and user flow charts

13



14

What Do I Need To Know?

- Hypertext Markup Language (HTML)
- Cascading Style Sheets (CSS)
- Javascript/DOM scripting
- Server-side programming

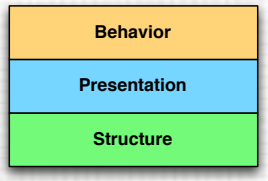
15

HTML vs. CSS

- HTML is a **markup language**
  - identifies/describes the various components of a document
  - indicates the document's underlying structure
- CSS describes **presentation** (how a page's content should look)
  - change the entire look of a Web site by editing a single style sheet document

16

Layers of Web Design



Scripts that make the page interactive

Controls how the content should appear

Establishes document content with HTML

17

Types of Interactivity

- Javascript/DOM scripting
  - Manipulates Web page elements, their styles, or even browser behavior
- Server-side programming
  - e.g., Perl, Python, PHP, Java, CGI scripts
  - Applications running on the server to handle forms, dynamically generate pages, work with databases, etc.

18

Types of Software Tools

- Web page authoring
  - Dreamweaver, Microsoft Expression Web, Nvu
- HTML editors
  - TextPad, Sublime Text, Coda, etc.
- Image-editing
  - Photoshop, Illustrator, GIMP
- Internet tools: browsers, FTP client, SSH/terminal application

19

Things to Keep in Mind

- Mobile devices
- Web standards
- Progressive enhancement
- Accessibility
- Site performance

20

- Mobile devices
  - can no longer depend on a fixed/common screen size
  - network speed may vary (3G/4G vs. broadband)
- Web standards
  - World Wide Web Consortium (W3C) documents standards for HTML, CSS, and Javascript
  - this keeps a site consistent across multiple (standards-compliant) browsers

21

- Progressive enhancement
  - different browsers provide different levels of support for Web standards, and users may deactivate some features
  - set a "baseline" experience and add more advanced features for browsers that can handle them
  - reverse of old "graceful degradation" philosophy
- Accessibility
  - people access the Web in many ways: visual browsers and mice, screen readers, foot pedals, etc.
  - sites should be built with as few barriers as possible
  - we will talk more about this later in the semester

22

- Responsive Web design
  - provide custom layouts based on size of viewport (browser window)
  - detect device capabilities on server end and send back whatever the device can handle
  - may consider separate mobile-specific site
- Site performance
  - limiting file sizes and reducing number of server requests

23

Next Time

- HTML markup for structure

24