Announcements

- Due dates extended!
  - Labs 2 and 3 due Monday 10pm
- Continuation of Networking postponed until Monday

Networking, URLs, and Pathnames

Internet and WWW

Servers serve

- Servers store and serve resources:
  - Emails—gmail
  - Files—dante and homer
  - Web pages—vergil and ovid
  - Printing
  - Databases—available to other computers on the network

Servers

- One computer can serve many things
  - Windows Vista have server software built in to share
    - Files, printers, over LAN
- Other server software
  - Windows Server 2008

Servers

- One computer serves many things—files, printing, email, and database…
- One dedicated computer serves one thing
  - One computer serves files
  - One computer serves Web pages
  - One computer serves email

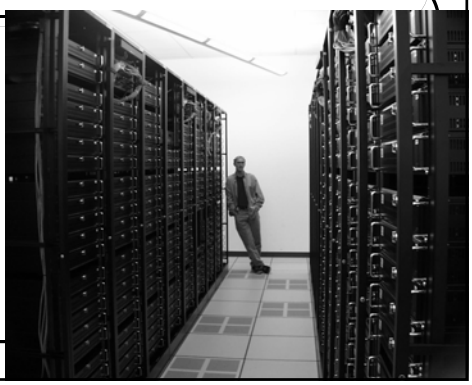
Server

- Servers fit into racks

Servers

- Empty rack

Server farm



Domain Name System

- Translates domain name to ip address
- Every domain name has to be unique
- Network Solutions maintains the list
  - Private company
  - Central database is the whois directory
- Several dozen registrars work with Network Solutions to add names to the list

DNS

- Network Solutions tracks top-level domains
- Any huge company with hundreds of thousands of IP addresses and host names wants to maintain its own domain name server for their domain.
- Countries probably wants to administrate their top-level domain

DNS

- Solution:
  - **distributed database**
  - Huge companies own their *own* DNS servers and they are in charge of maintaining them
    - Microsoft can change the database for its domain whenever it wants to because it owns its domain name servers.
    - Every domain has a domain name server somewhere that handles its requests. A person maintains the records in that DNS.

The DNS process

- You click link, sending http request to Web browser for our course Web site.
- Browser contacts its name server and says, "I need for you to convert a domain name to an IP address for me."
- The name server may already know the IP address for our web site if another request to resolve it came in recently (name servers cache IP addresses to speed things up).

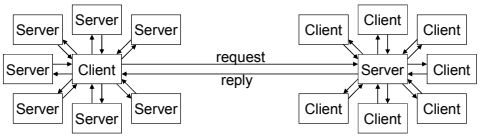
DNS Process (continued)

- If not cached
  - Name server contacts first listed **root name servers**. The root servers know the IP address for all of the name servers that handle the top-level domains. Your name server would ask the root for our courses.washington.edu name, and the root would say (assuming no caching), "I don't know the IP address for that, but here's the IP address for the EDU name server."
  - If unknown, it contacts the next root server

Client/Server Interaction

For Web pages, the client requests a page, the server returns it

- Two separate transmissions



10/9 **Servers serve many clients; clients visit many servers**

Internet

- Internet is all the wires, routers, gateways, servers—all using TCP/IP to transfer packets
- Many different protocols use the Internet
  - ftp, smtp, chat, IM, Skype, VoIP, http

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World Wide Web

World Wide Web is the collection of servers & the Web pages they store and serve

- Server—the Web site computer
- Client—the surfer's browser
- www—the traditional Web server name
  - Any name is OK
  - Often multiple server names map to the same site: MoMA.org and www.MoMA.org

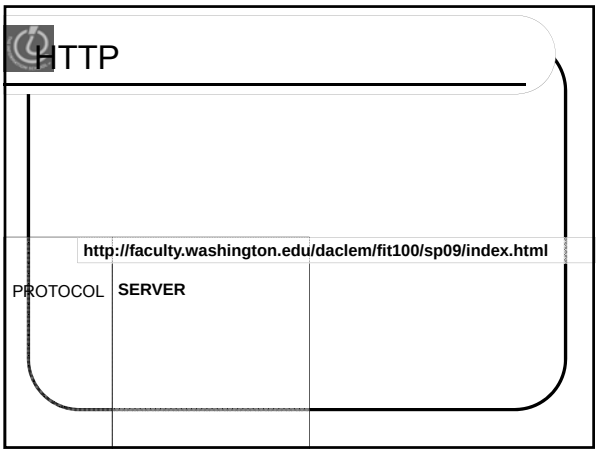
HTTP

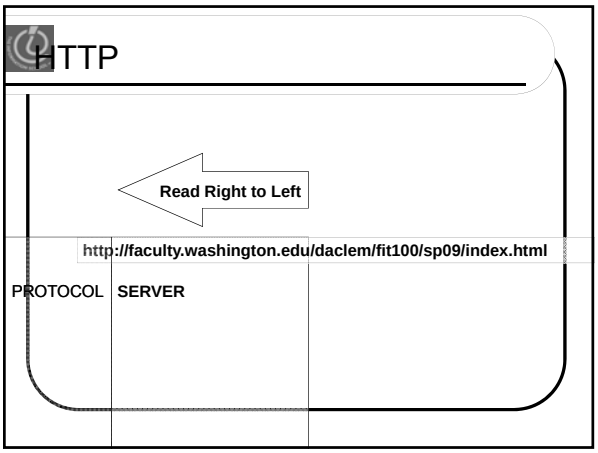
- **H**yper**T**ext **T**ransfer **P**rotocol
  - Understands how to interpret URLs
    - Uniform Resource Locators
  - Divides URL into server and pathname

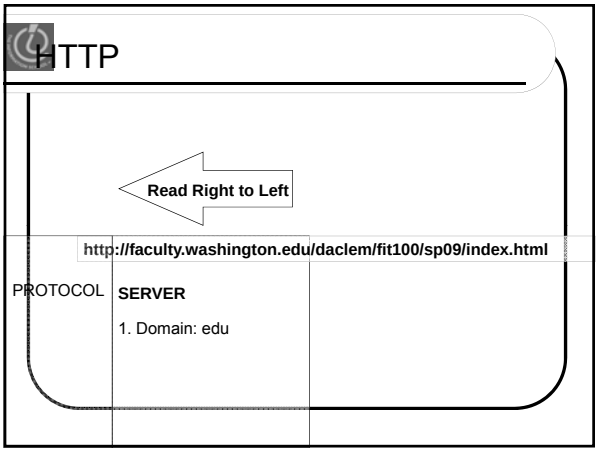
HTTP

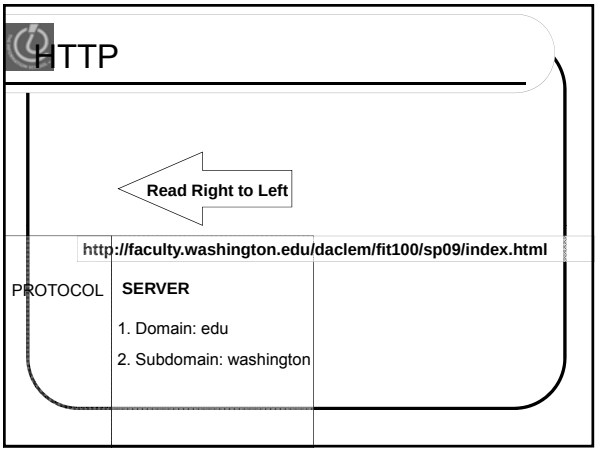
http://faculty.washington.edu/daclem/fit100/sp09/index.html

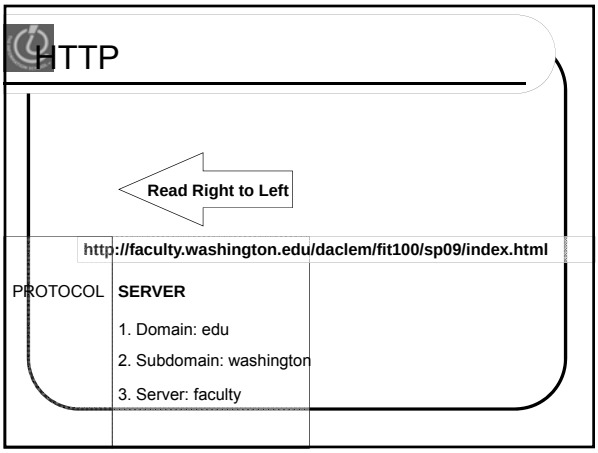
PROTOCOL (Web)

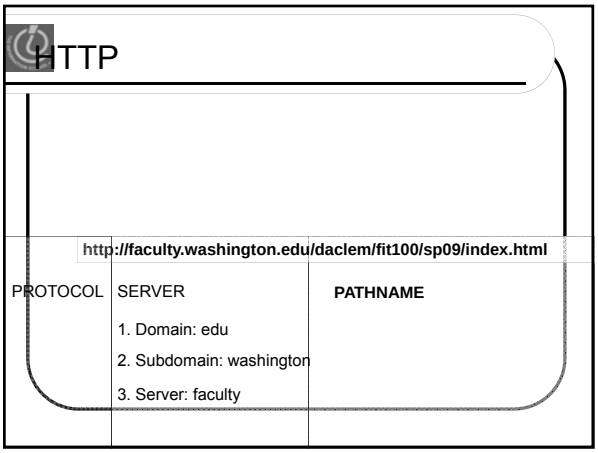

HTTP
http://faculty.washington.edu/daclem/fit100/sp09/index.html
PROTOCOL
SERVER


HTTP
Read Right to Left
http://faculty.washington.edu/daclem/fit100/sp09/index.html
PROTOCOL
SERVER


HTTP
Read Right to Left
http://faculty.washington.edu/daclem/fit100/sp09/index.html
PROTOCOL
SERVER
1. Domain: edu


HTTP
Read Right to Left
http://faculty.washington.edu/daclem/fit100/sp09/index.html
PROTOCOL
SERVER
1. Domain: edu
2. Subdomain: washington


HTTP
Read Right to Left
http://faculty.washington.edu/daclem/fit100/sp09/index.html
PROTOCOL
SERVER
1. Domain: edu
2. Subdomain: washington
3. Server: faculty


HTTP
http://faculty.washington.edu/daclem/fit100/sp09/index.html
PROTOCOL
SERVER
PATHNAME
1. Domain: edu
2. Subdomain: washington
3. Server: faculty

HTTP

Read Left to Right

http://faculty.washington.edu/daclem/fit100/sp09/index.html

PROTOCOL	SERVER	PATHNAME
	1. Domain: edu	
	2. Subdomain: washington	
	3. Server: faculty	

HTTP

Read Left to Right

http://faculty.washington.edu/daclem/fit100/sp09/index.html

PROTOCOL	SERVER	PATHNAME
	1. Domain: edu	4. Account: daclem
	2. Subdomain: washington	
	3. Server: faculty	

HTTP

Read Left to Right

http://faculty.washington.edu/daclem/fit100/sp09/index.html

PROTOCOL	SERVER	PATHNAME
	1. Domain: edu	4. Account: daclem
	2. Subdomain: washington	5. Folder: fit100/sp09
	3. Server: faculty	

HTTP

Read Left to Right

http://faculty.washington.edu/daclem/fit100/sp09/index.html

PROTOCOL	SERVER	PATHNAME
	1. Domain: edu	4. Account: daclem
	2. Subdomain: washington	5. Folder: fit100/sp09
	3. Server: faculty	6. File: index.html

HTTP

Not case sensitive Case Sensitive

Read Left to Right

http://faculty.washington.edu/daclem/fit100/sp09/index.html

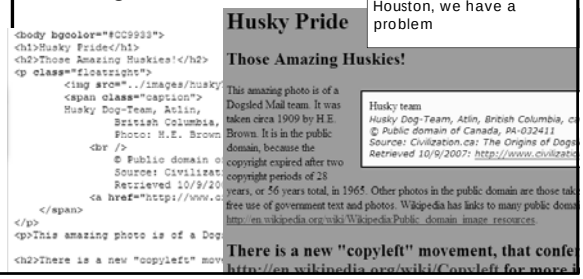
PROTOCOL	SERVER	PATHNAME
	1. Domain: edu	4. Account: daclem
	2. Subdomain: washington	5. Folder: fit100/sp09
	3. Server: faculty	6. File: index.html

HTML

- *Validating*
- *Paths for images and links*

Demonstration

After building a web page, we find it is wrong



Debugging Demo

Paths

- Two types of paths
  - Relative
    - To folder where this html page is located
  - Absolute
    - Complete URL

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Paths

- Relative path
  - src="huskyTeam.jpg"
- Absolute path
  - href="http://courses.washington.edu/fit100/au09/images/huskyTeam.jpg"

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Paths

- Relative path
  - href="huskyPride.html"
- Absolute path
  - href="http://www.cs.washington.edu/education/courses/cse100/08sp/examples/huskyPride.html "

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http

- http = **H**yper**T**ext **T**ransfer **P**rotocol
- https = **S**ecure http
  - Starts every link and every Web address
  - Sends pages across the Internet to Web servers

http://www.mybus.org/metrokc/avl.jsp?id=5905

https://courses.washington.edu/infx501/08au/

Hypertext links

- A Web page is a collection of hypertext links, or links
  - Links allow you to jump to another page clear across the Web

The Language of Web Pages

- HTML = **H**yper**T**ext **M**arkup **L**anguage
  - The language that Web browsers understand

HTML tags

The content with HTML tagging

```
<h1>My first Web page!</h1>
<p>A new paragraph…</p>
```

The Web page displayed in a Web browser

My first Web page!

A new paragraph…

HTML structures the content

- Tags structure the page
  - Formerly, they also formatted the content; now, that's done by CSS

Basic HTML page structure

All HTML files use the same structure:

```
<html>
  <head>
    <title>
    </title>
  </head>
  <body>
  </body>
</html>
```


Paired tags

Tags are paired—opening and closing tags

```
<html>
  <head>
    <title>Name of Page Goes Here
    </title>
  </head>
  <body>
  </body>
</html>
```

Nested tags

Other tags "nest" inside the <html> tags:

```
<html>
  <head>
    <title>Name of Page Goes Here
    </title>
  </head>
  <body>

  </body>
</html>
```


Basic HTML Structure

An HTML file is divided into head and body sections.

```
<html>
  <head>
    <title>Name of Page Goes Here
    </title>

  </head>
  <body>

  </body>
</html>
```


Basic HTML Structure

The <head> contains metadata.

```
<html>
  <head>
    <title>Name of Page Goes Here
    </title>
    Metadata
  </head>
  <body>

  </body>
</html>
```


The Header section

The head contains metadata.

```
<html>
  <head>
    <title>Name of Page Goes Here
    </title>
    Other metadata goes here
  </head>
  <body>

  </body>
</html>
```


The Body section

The body contains the page content—everything that shows on the Web page.

```
<html>
  <head>
    <title>Name of Page Goes Here
    </title>

  </head>
  Content
</html>
```


Areas that are off limits

The body contains the page content—everything that shows on the Web page.

```
<html>
  <head>
    <title>Name of Page Goes Here
    </title>
  </head>
    No content here
  <body>
    Body content goes here
  </body>
</html>
```

Areas that are off limits

The body contains the page content—everything that shows on the Web page.

```
<html>
  <head>
    <title>Name of Page Goes Here
    </title>
  </head>
  <body>
     Body content goes here
  </body>
</html>
No content here
```


HTML AND VALIDATION

Nesting Rules—by tag

Not Allowed Inside Other Tags	May Nest Inside These Exceptions:
h1, h2, h3, h4, h5, h6 ol, ul, dl hr table	div, form, blockquote, li, td, th
Tags that Must Nest Inside Others	**Exceptions**
br Img span a	None

Nesting Rules—Specific Tags

Inner Tag	Specific Outer Tag
td or th	tr
tr	thead or tbody
thead or tbody	table
li	ol or ul
input, button, textarea, select	form

Error Messages—Tag Order

Error Message: Nesting error: tag2 must be closed before closing tag1

Invalid code

<tag1><tag2>content</tag1></tag2>

Valid code

<tag1><tag2>content</tag2></tag1>

Simile:

<FedEx><bubbleWrap>Present</bubbleWrap></FedEx>

Error Messages—Alternate Fix

Error Message: Nesting error: tag2 must be closed before closing tag1

Invalid code

- <tag1><tag2>content</tag1></tag2>

Valid code

<tag1><tag2>content</tag1></tag2>

<tag1>
** <tag2>content</tag2>**
</tag1>

Tag Location Rules

- All tags
  - Must be nested inside head or body
  - Cannot be outside head or body or html
  - Cannot be between head and body

Error Messages—Tag Location

Error Message: The tag <sometag> is not allowed within: html

Invalid code

```
<html>
   <head></head>
        <sometag>Neither tags nor content can go here</sometag>
   <body></body>
</html>And the long page is done.
```

Valid code

```
<html>
   <head>Metadata tags must go here</head>
   <body>Content tags must go here</body>
</html>
```


Error Messages—No DOCTYPE

Error Message: No DOCTYPE found!

Invalid code

```
<html>
```

Valid code

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html
    PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
   "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
```


Error Messages—Image Tags

Error Message:
- There is no scr attribute for: img
- Missing alt tag
- Missing closing img tag

Invalid code

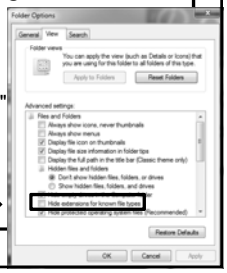
```
<img scr="kitten.jpg" >
```

Valid code

```
<img src="kitten.jpg"
alt="young spokespurrrrson" />
```

Other image problems

- Kitten.jpg ≠ Kitten.JPG ≠ Kitten.png
- Puppy.png ≠ Puppy.jpg.png
  - Set your computer to show extensions!
    - Folder options > View tab > Uncheck "Hide extensions…"



Quiz topics

- TCP/IP
- LAN, WAN, GUI
- HTTP
- HTML
- URL
- Dante
- White space
- Internet
- WWW
- Server