CMPT 165
Intro to Internet & WWW - Part 2

May 15th 2015

Admin

- Course textbook: “CMPT 165 Study Guide”
  - Details of course topics listed in “Table of Contents”
- Course website updated

  http://www.cs.sfu.ca/CourseCentral/165/lisat/
- Class structure:
  - First part: ~35min. focus presentation
  - Second part: ~15min. personal guidance
- Q’s about lab will be answered at 2nd part of class
- Class slides: posted only after class by end of day
  - Don’t need to take notes for definitions, etc.
  - Use slide number

Admin

- Exercises: short (1%)
  - posted 1 week prior to due date
- Assignments: longer (7%)
  - Posted at 2 weeks prior to due date

- To get timely response, please email ALL technical questions (e.g. “Cannot install”, “how to…”, etc.) to:

  cmpt165-d1-help@sfu.ca

- TA office hours

Today's agenda

Unit 1:

- Internet structure
- Client/server
- IP address
- Protocols
- URL
- MIME
- …

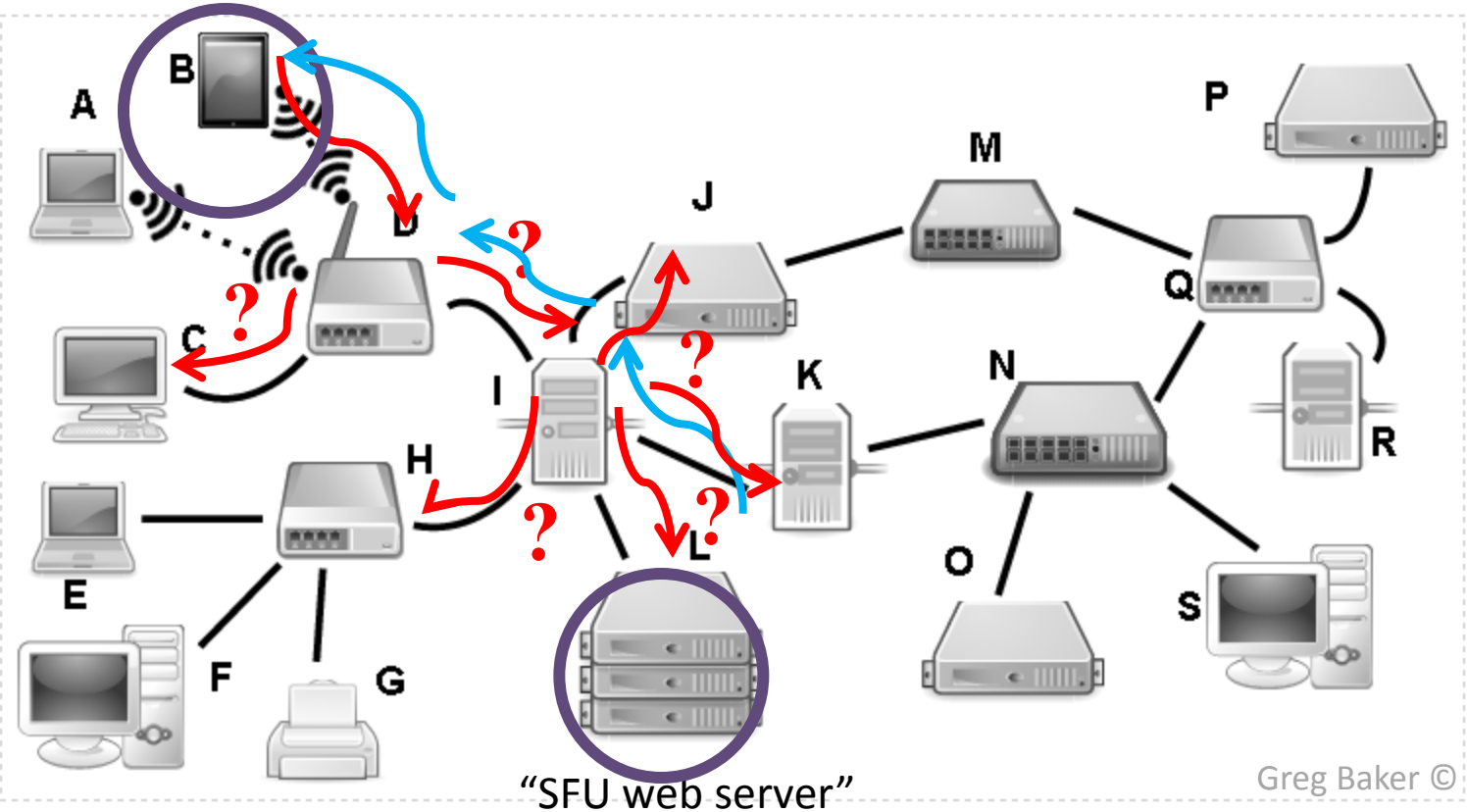
Unit 2:

- HTML markup: a quick intro
- Lab exercise 1

Internet Structure & Client-Server (reviewed)

Request to view the "www.sfu.ca" webpage

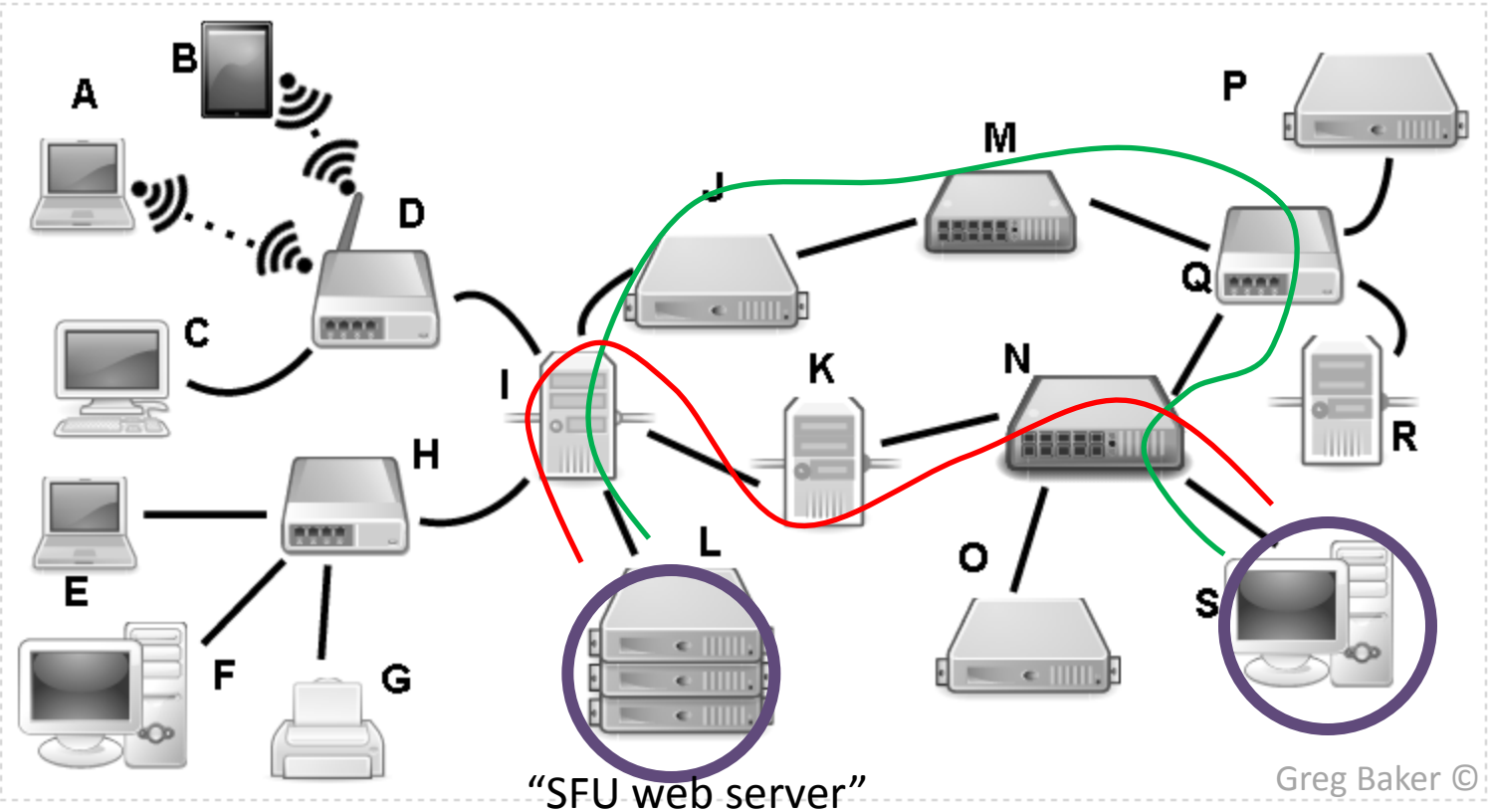
1. **Client (B):** requests the webpage for "www.sfu.ca"
2. **Network device (D):** relays request to the correct path
3. **Server (L):** receives + processes request + send data back



Client-Server communication (reviewed)

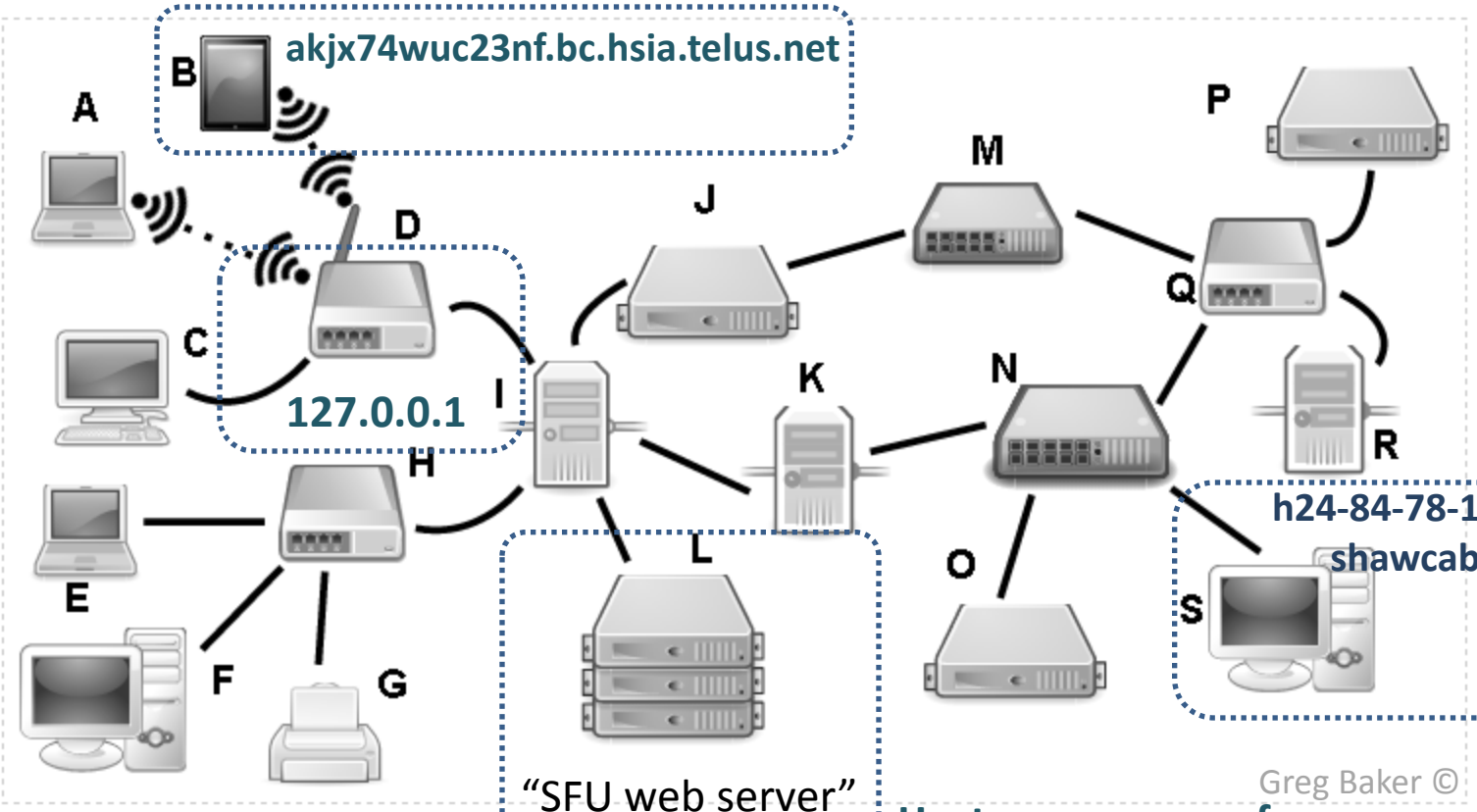
Client S request to view the "www.sfu.ca" webpage on your tablet…

1. **Client (S):** requests the webpage for "www.sfu.ca"
2. **Network device (D):** relays request to the correct path
3. **Server (L):** receives + processes request + send data back



IP address (reviewed)

- **Domain Name System** (DNS) keeps track of every IP address, relation between domains and hosts
- **DNS software**: operate with this system
- Server dedicated for DNS: **Name Server**



Demo

`ipconfig` (`ifconfig -a` in Mac)

`nslookup`

In Mac:
Network Utility
→ Lookup tab
→ "Please enter an internet address to lookup”
→ Select Default Information
→ Uncheck “Use "dig" in place of "nslookup“
→ Lookup

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- …

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Protocols

- Like a language used by network devices
- Set of rules

TCP/IP (Transmission Control Protocol/ Internet Protocol)

- Network protocols governing how communication between devices operate
- e.g.
  - Border Gateway Protocol (BGP): exchange *routing* information between systems
  - …

Other commonly used protocols

HTTP: HyperText Transfer Protocol

HTTPS: secured version of HTTP

FTP: File Transfer Protocol

- For transfer of files

SFTP: Secure File Transfer Protocol

SMTP: Simple Mail Transport Protocol

- Used by email clients

Uniform Resource Locator (URL)

http://www.sfu.ca/learning/study-abroad.html

Scheme: type of network protocol

Server: domain name of a server

Path: the location of a specific file stored on server

- More examples:
  - http://www.sfu.ca
  - https://my.sfu.ca
  - http://cmpt165.csil.sfu.ca/~lisat
  - ftp://ftp.mozilla.org/pub/mozilla/releases

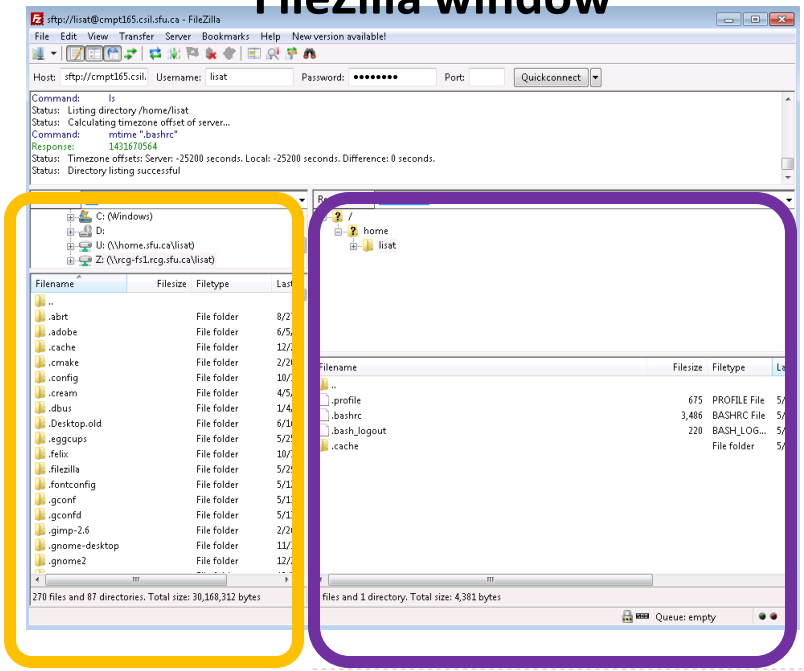
Port Number

Port: a designation number for a protocol (which application software)

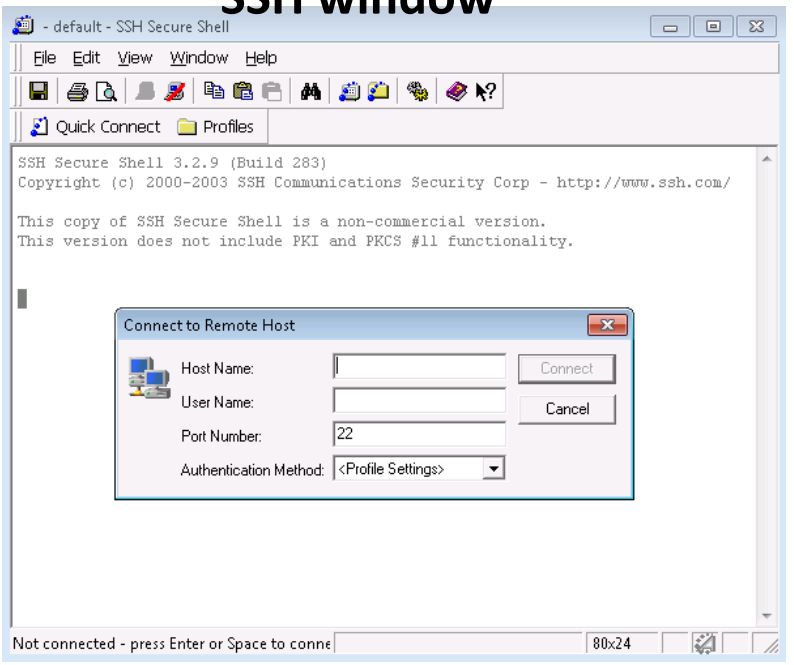
Examples:

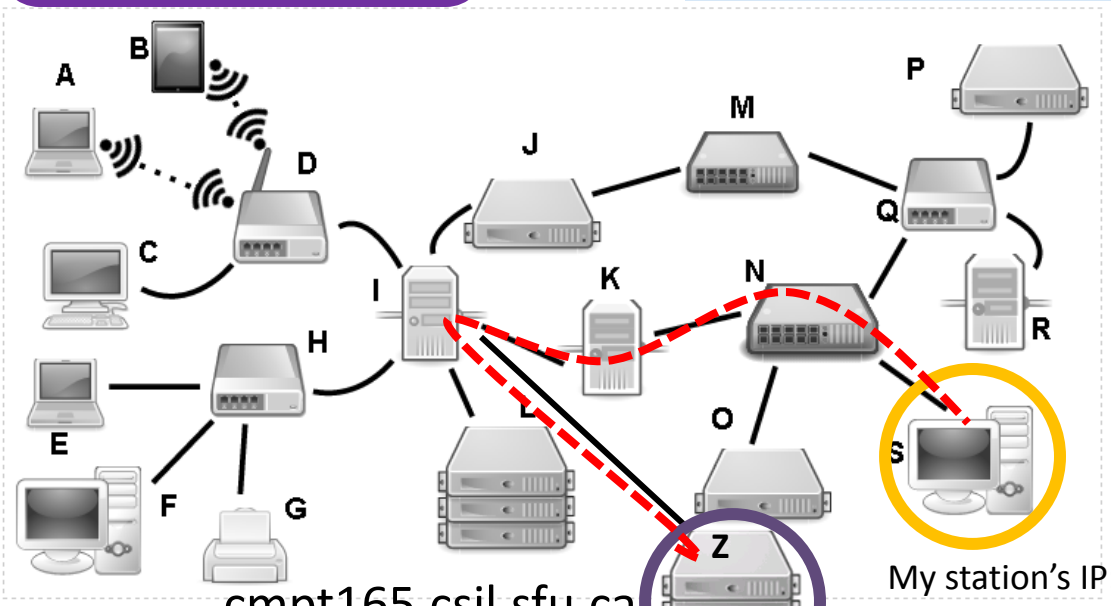
- 20 & 21: File Transfer Protocol (FTP)
- 22: Secure Shell (SSH)
- 23: Telnet remote login service
- 25: Simple Mail Transfer Protocol (SMTP)
- 53: Domain Name System (DNS) service
- 80: Hypertext Transfer Protocol (HTTP) used in the World Wide Web
- 110: Post Office Protocol (POP3)
- 119: Network News Transfer Protocol (NNTP)
- 143: Internet Message Access Protocol (IMAP)
- 161: Simple Network Management Protocol (SNMP)
- 194: Internet Relay Chat (IRC)
- 443: HTTP Secure (HTTPS)
- 465: SMTP Secure (SMTPS)
- …

FileZilla window



SSH window





cmpt165.csil.sfu.ca

Web server's IP:[142.58.21.82]

My station's IP: [199.60.5.178]

MIME Types

"Multi-purpose Internet Mail Extensions"

- Tells an application software what the data being received contains
- E.g. web browser uses MIME to figure out how to display a webpage

MIME type	File contents	How it might be handled
text/html	HTML (web page)	display in browser as a web page
application/pdf	Acrobat file	open in Adobe Acrobat
application/msword	MS Word document	open in Word
image/jpeg	JPEG image	display in browser
audio/mpeg	MP3 audio	open with iTunes
video/quicktime	Quicktime video	open with Windows Media

type / subtype

Figure 1.4: Some example MIME types

– If unsure, browser asks "Download/Save?"

World Wide Web

- Consists of a set of software services running on the Internet + webpages (connected documents)
- Internet vs. WWW?
  - Hardware vs. software
  - Internet Protocol vs. HTTP
- World Wide Web Consortium (W3C)
  - made up of member organizations, each with staff working on developing "standards for the WWW"
  - Has 397 members as of April 2015 [wiki]

Questions on Unit 1?

(Ask questions on lab later)

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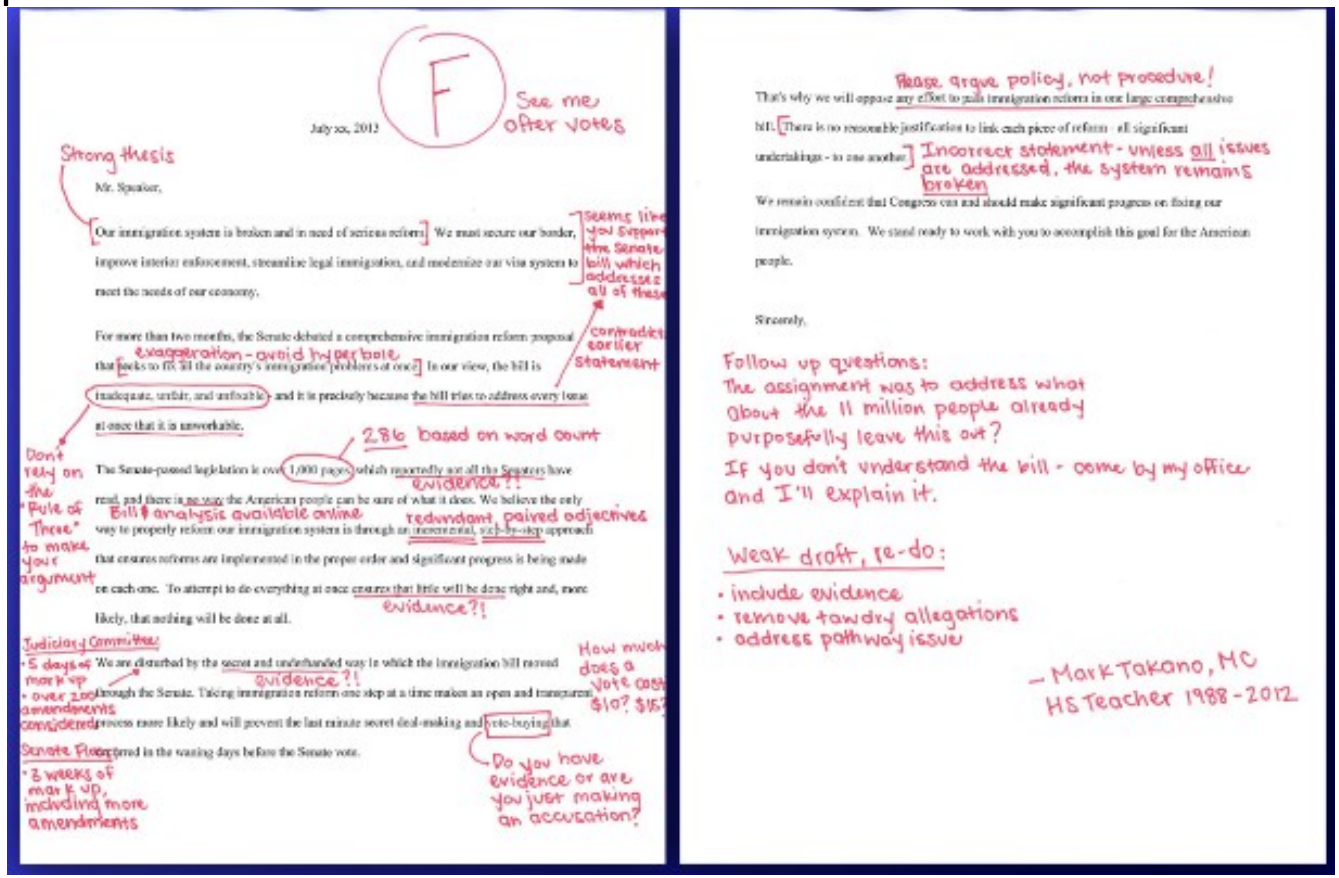
Unit 2 - Making webpages: a quick intro

Markup

- Webpages are described using “markup language”
- A language spoken to web browser, tells it how to display the webpage
- Markup ➔ annotate



Markup

- Webpages are described using “markup language”
- A language spoken to web browser, tells it how to display the webpage
- Markup ➔ annotate
- Name of this language

  eXtensible HyperText Markup Language (XHTML)

- HyperText:
  - Hyper → dynamic

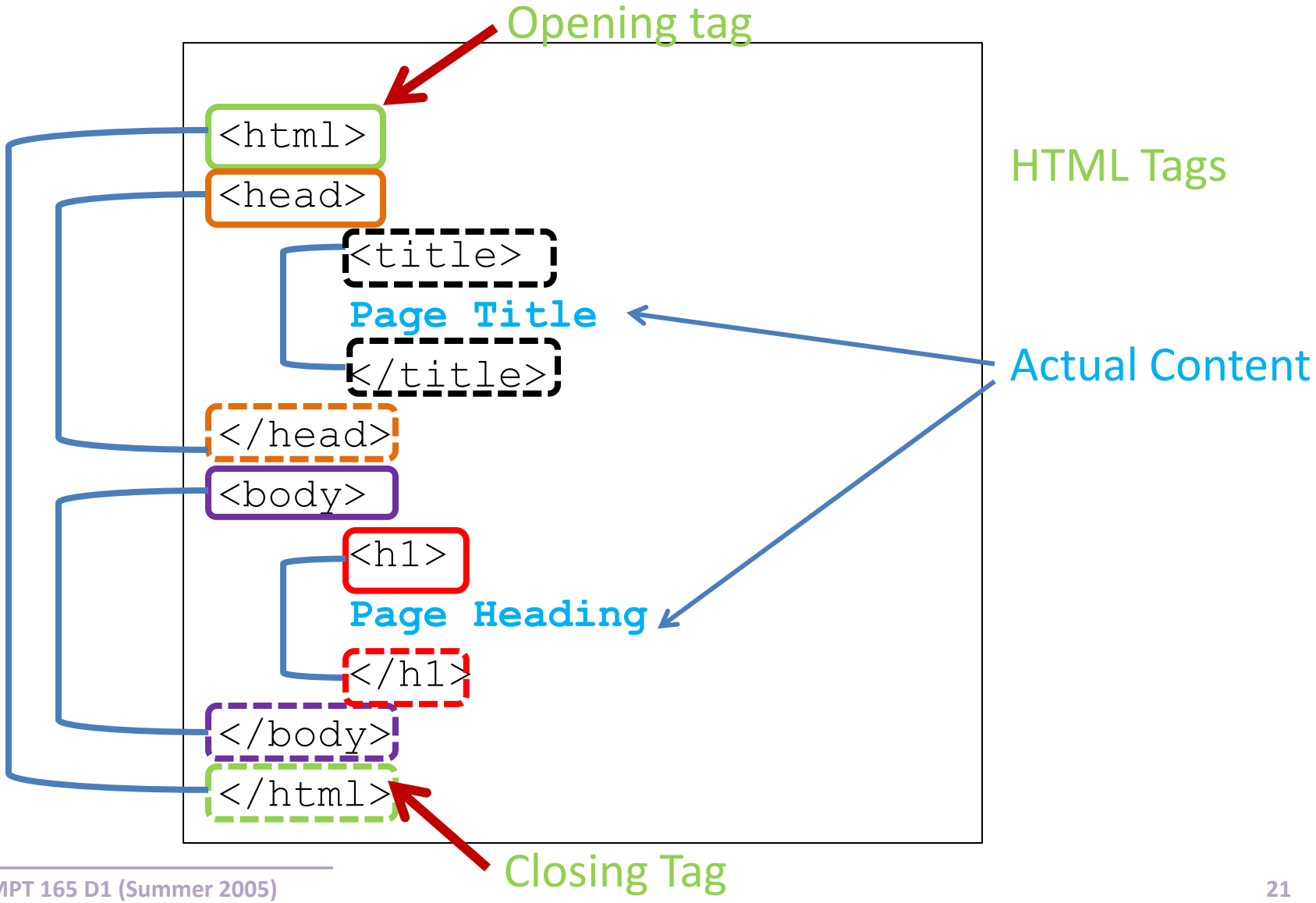
- Older version: HTML

  e.g. http://www.sfu.ca/learning/study-abroad.html

- Latest version HTML5

A simple XHTML

(A language spoken to web browser, tells it how to display the webpage)



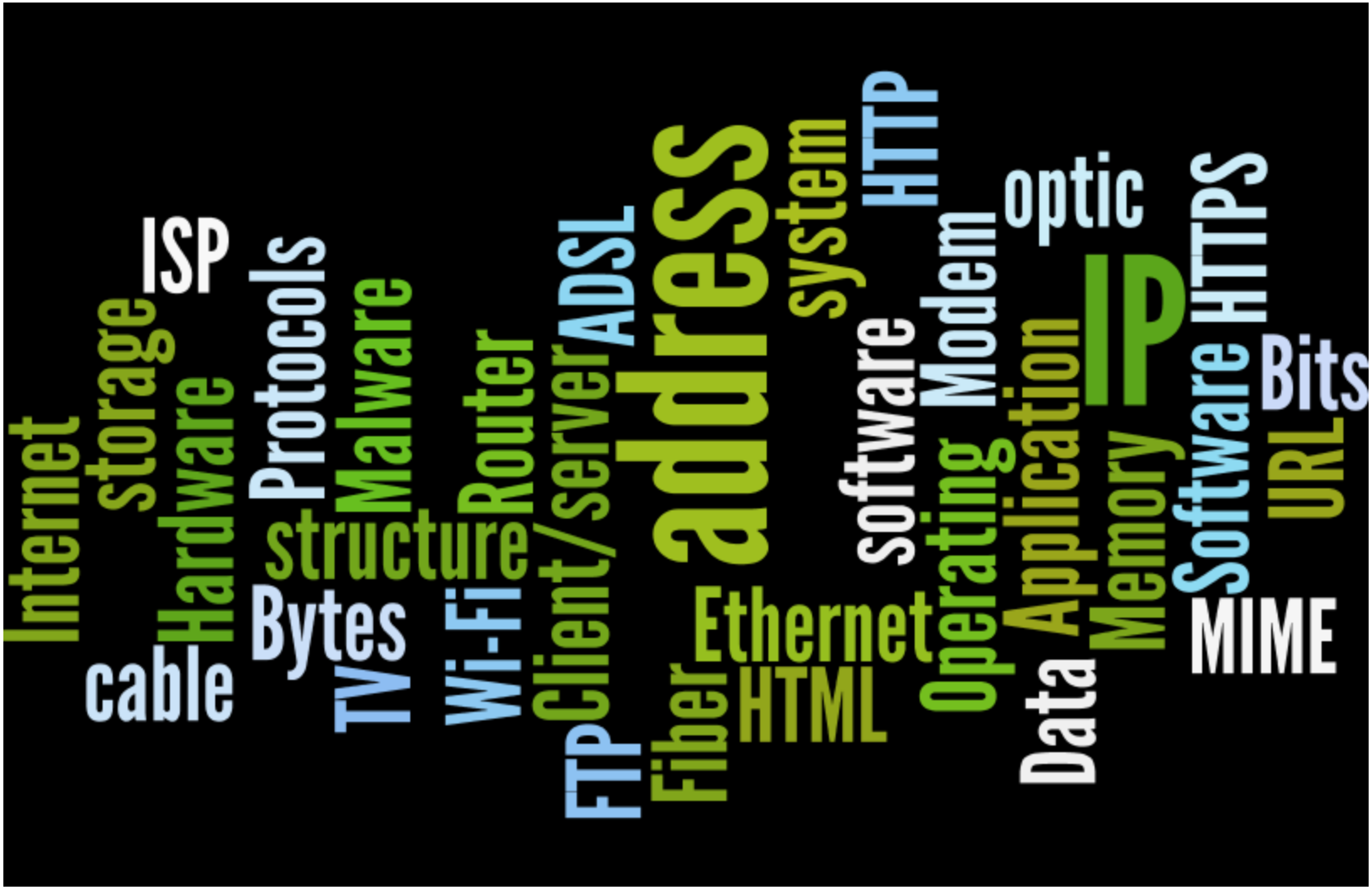
HTML tags

```
<html>
<head>
<body>
<h1>

<h2>
<h3>
<p>
```

Key terms

Hardware Software Application software Operating system Malware	Internet structure Modem Router ISP	Client/server IP address
		Protocols HTTP FTP HTTPS
Data Bits Bytes Memory storage	Fiber optic ADSL TV cable Ethernet Wi-Fi	URL MIME HTML HTML Tags


ISP
Internet
storage
Hardware
Protocols
Malware
structure
Router
Wi-Fi
Client/server
ADSL
address
system
HTTP
optic
HTTPS
Modem
IP
Bits
software
Application
Software
URL
Memory
Operating
Data
Ethernet
MIME
HTML
Fiber
FTP
Bytes
TV
cable

Questions?