ICT-705
WEB PROGRAMMING

Course Objectives

- At the end of this class you will be able to:
  - Design and implement a website
  - Author web pages using HTML
  - Make stylistic decisions with CSS
  - Create interactive websites with JavaScript and jQuery
  - Enhance interactive websites with AJAX and XML
  - Use PHP for server programming

Grading

Attendance	10%
Presentation	10%
Mid	20%
Final exam	60%
Total	100%

Programming Project

- You can start working on this from the first week of the class
- Design and implementation of a professional website:
  - Professional Style
  - Interactive
- I will post topics: mostly websites needed by faculty and staff in our school
- You can complete the project in teams of three

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The INTERNET… and a bit of history

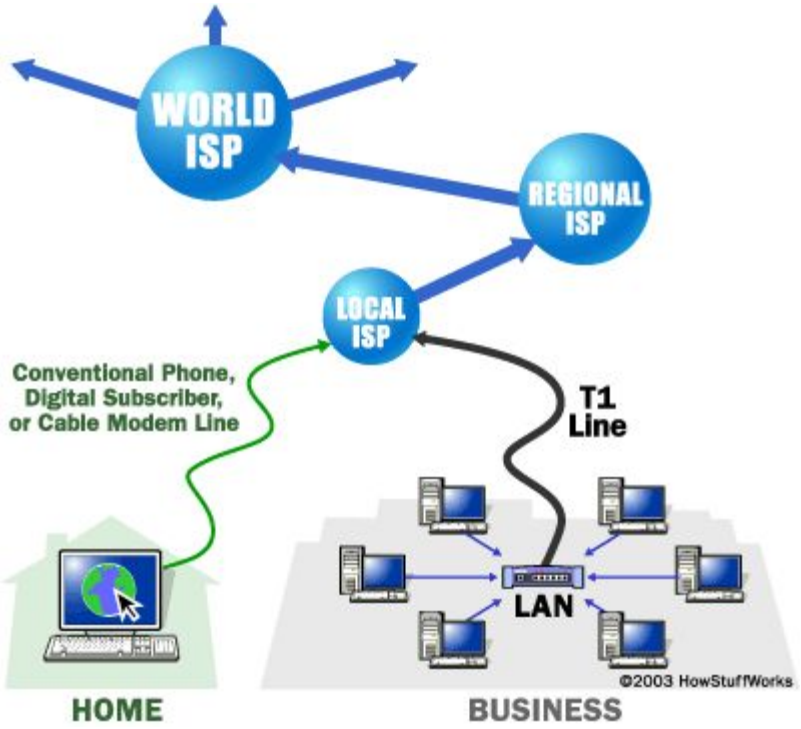
ICT-705

What is the internet?

- A “series of tubes”
- How many Internets are out there?
- Is Google one of them?

What is the internet?

- A collection of computer networks that use a protocol to exchange data
- Is the World Wide Web (WWW) and the internet the same?



Brief history

- Began as a US Department of Defense network called ARPANET (1960s-70s)
- Packet switching (in the 60s)
- E-mail is born on 1971
- TCP/IP beginning on 1974 (Vinton Cerf)
- USENET (1979)
- By 1987: Internet includes nearly 30,000 hosts

Brief history (cont.)

- WWW created in 1989-91 by Tim Berners-Lee
- Popular web browsers released:
  - Netscape 1994
  - IE 1995
- Amazon.com opens in 1995
- Google January 1996
- Wikipedia launched in 2001
- MySpace opens in 2003
- Facebook February 2004


tweakers.net
SECOND LIFE
friendster
SMULWEB
Slashdot
imvu
Hyves.nl
PARTY FLOCK
myspace.com.
orkut
del.icio.us
KOESKEURIG
interactieve kooptips
generationnext
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Ouders Online
XING
listible
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Nicktropolis
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www.eDorm.cn
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YEEJEE
neopets
tribe
xuqacm
FaceRen
Blogger
YuMe
netvibes
jaiku
Techmeme
RATE IT ALL
YAHOO! GEOCITIES
SchoolBANK
dodgeball
HABBO
digg

The future of the internet?

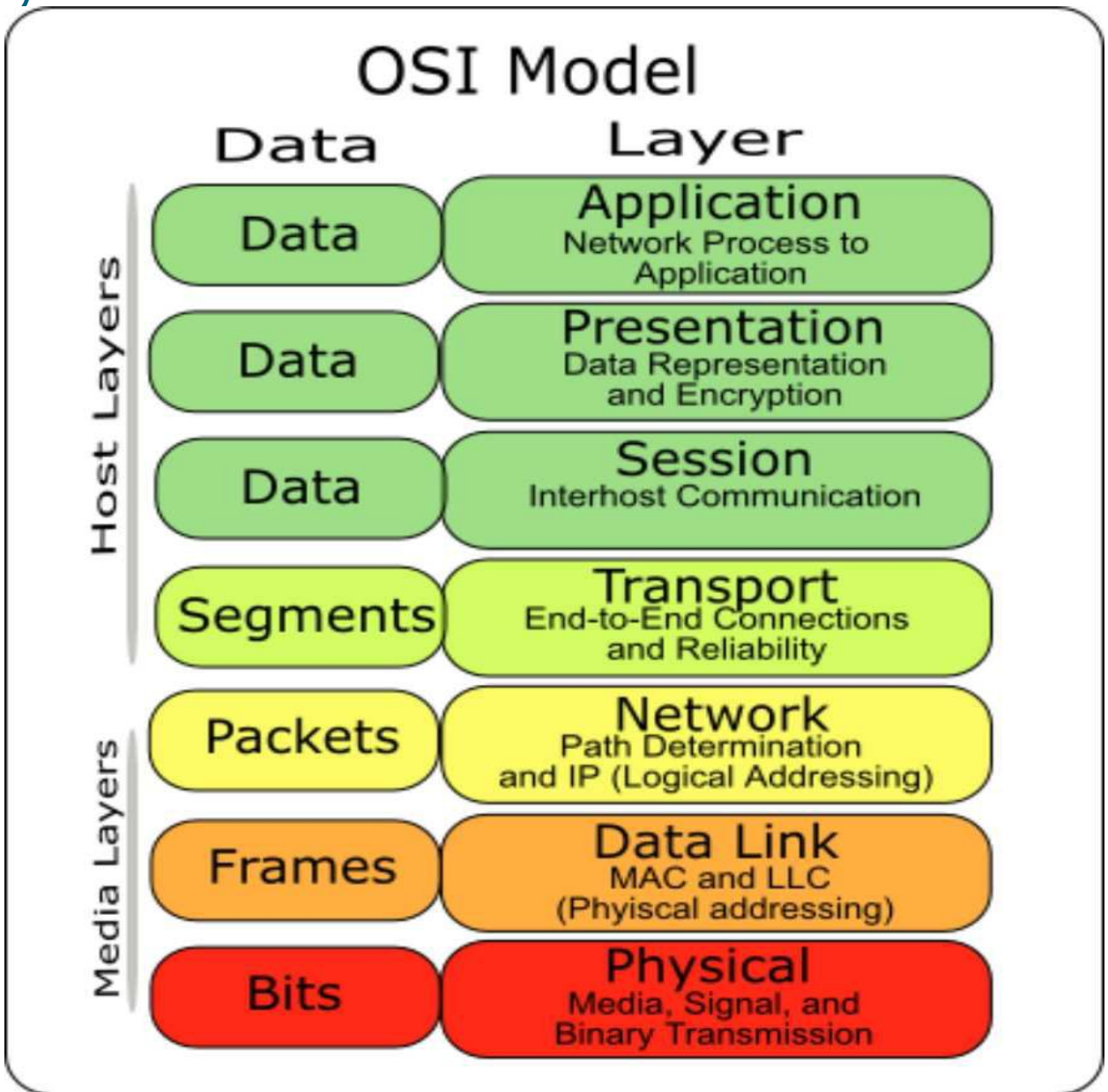
Key aspects of the internet

- Sub-networks are independent
- Computers can dynamically join and leave the network
- Built on open standards
- Lack of centralized control (mostly)
- Everyone can use it with simple, commonly available software

People and organizations

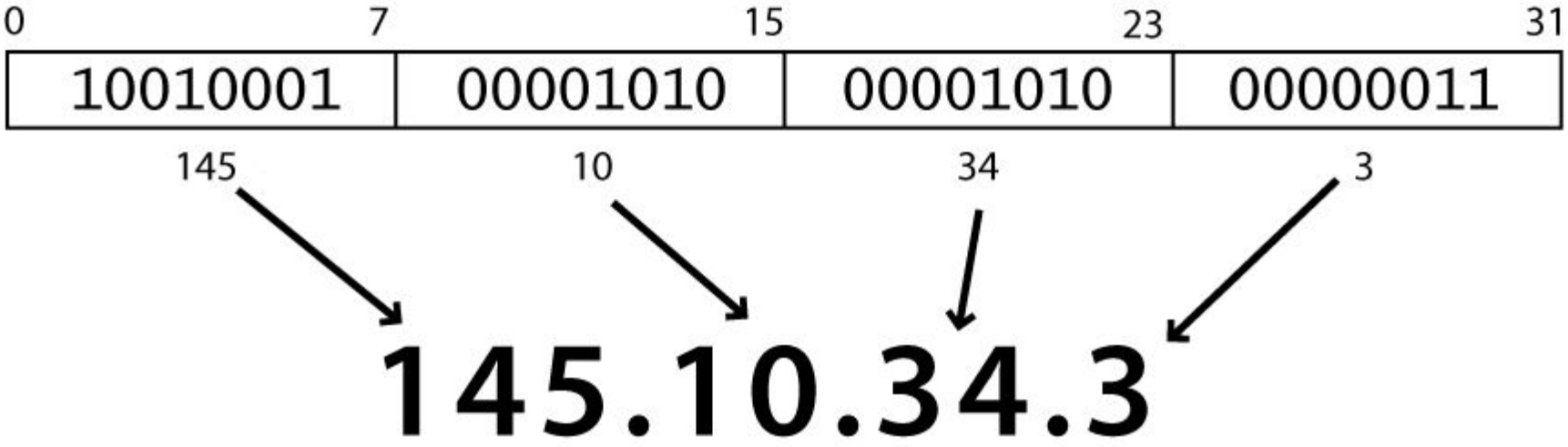
- Internet Engineering Task Force (IETF): internet protocol standards
- Internet Corporation for Assigned Names and Numbers (ICANN): decides top-level domain names
- World Wide Web Consortium (W3C): web standards

Layered architecture



Internet Protocol (IP)

- Simple protocol for data exchange between computers
- IP Addresses:
  - 32-bit for IPv5
  - 128-bit for IPv6



Transmission Control Protocol (TCP)

- Adds multiplexing, guaranteed message delivery on top of IP
- Multiplexing: multiple programs using the same IP address
- Port: a number given to each program or service
  - port 80: web browser (port 443 for secure browsing)
  - port 25: email
  - port 22: ssh
- Some programs (games, streaming media programs) use simpler UDP protocol instead of TCP

Web Servers

- Web server: software that listens for web page requests
  - Apache
  - Microsoft Internet Information Server (IIS)

Application Server

- Software framework that provides an environment where applications can run
  - Apache
  - Glassfish
  - WebSphere
  - WebLogic

Web Browser

- Web browser: fetches/displays documents from web servers
  - Mozilla Firefox
  - Microsoft Internet Explorer (IE)
  - Apple Safari
  - Google Chrome
  - Opera

Domain Name Server (DNS)

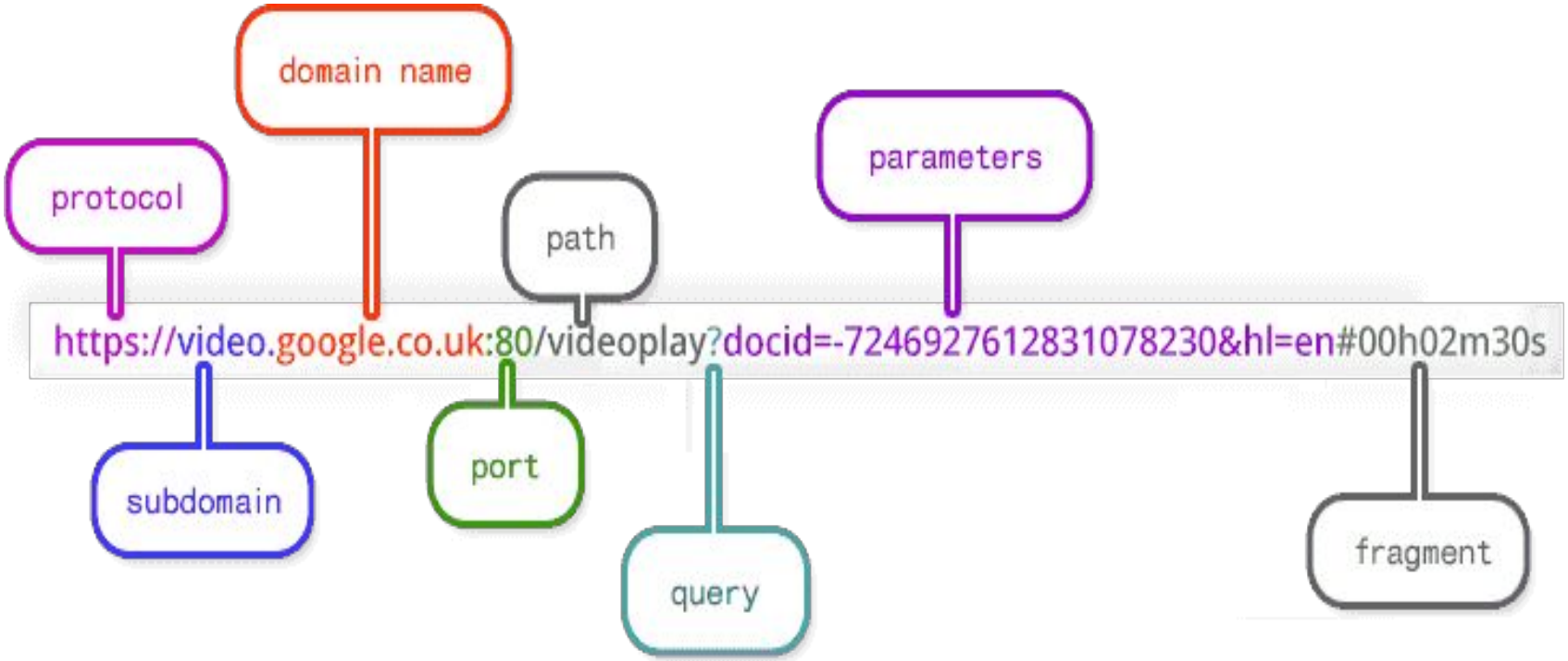
- Set of servers that map written names to IP addresses
  - Example: ju.edu → **204.29.160.73**
- Many systems maintain a local cache called a hosts file
  - Windows: C:\Windows\system32\drivers\etc\hosts
  - Mac: /private/etc/hosts
  - Linux: /etc/hosts

Uniform Resource Locator (URL)

- Identifier for the location of a document on a web site
  - Example: http://dept.ju.edu/cs/index.html
- Upon entering this URL into the browser, it would:
  - ask the DNS server for the IP address of dept.ju.edu
  - connect to that IP address at port 80
  - ask the server to GET /cs/index.html
  - display the resulting page on the screen


domain name
path
https://doepud.co.uk/blog/anatomy-of-a-url
protocol

Simple URL


domain name
protocol
path
parameters
https://video.google.co.uk:80/videoplay?docid=-7246927612831078230&hl=en#00h02m30s
subdomain
port
query
fragment

Complex URL

Hypertext Transport Protocol (HTTP)

- Set of commands understood by a web server and sent from a browser
- Some HTTP commands (your browser sends these internally):
  - GET filename : download
  - POST filename : send a web form response
  - PUT filename : upload
- Exercise: simulate a browser with a terminal window

HTTP Error Codes

- When something goes wrong, the web server returns a special "error code" number
- Common error codes:

Number	Meaning
200	OK
301-303	page has moved (permanently or temporarily)
403	you are forbidden to access this page
404	page not found
500	internal server error

Internet Media ("MIME") types

MIME type	file extension
text/html	.html
text/plain	.txt
image/gif	.gif
image/jpeg	.jpg
video/quicktime	.mov
application/octet-stream	.exe

Web Languages

- Hypertext Markup Language (HTML): used for writing web pages
- Cascading Style Sheets (CSS): stylistic info for web pages
- PHP Hypertext Processor (PHP): dynamically create pages on a web server
- JavaScript: interactive and programmable web pages

Web Languages(cont.)

- Asynchronous JavaScript and XML (Ajax): accessing data for web applications
- eXtensible Markup Language (XML): meta-language for organizing data