

Nature of Computing

Chapter 9

Internet and the World Wide Web

ARPANET Pioneers Build an Unreliable Network

... on Purpose

- ✓ The Advanced Research Projects Agency NETwork (ARPANET) is the predecessor to the Internet:
 - Developed at the request of the Department of Defense by a team of visionary computer scientists
 - Launched in 1969 connecting government agencies and universities
 - Disbanded in 1990, having fulfilled its research mission, but its technology lives on as the Internet



Inside the Internet

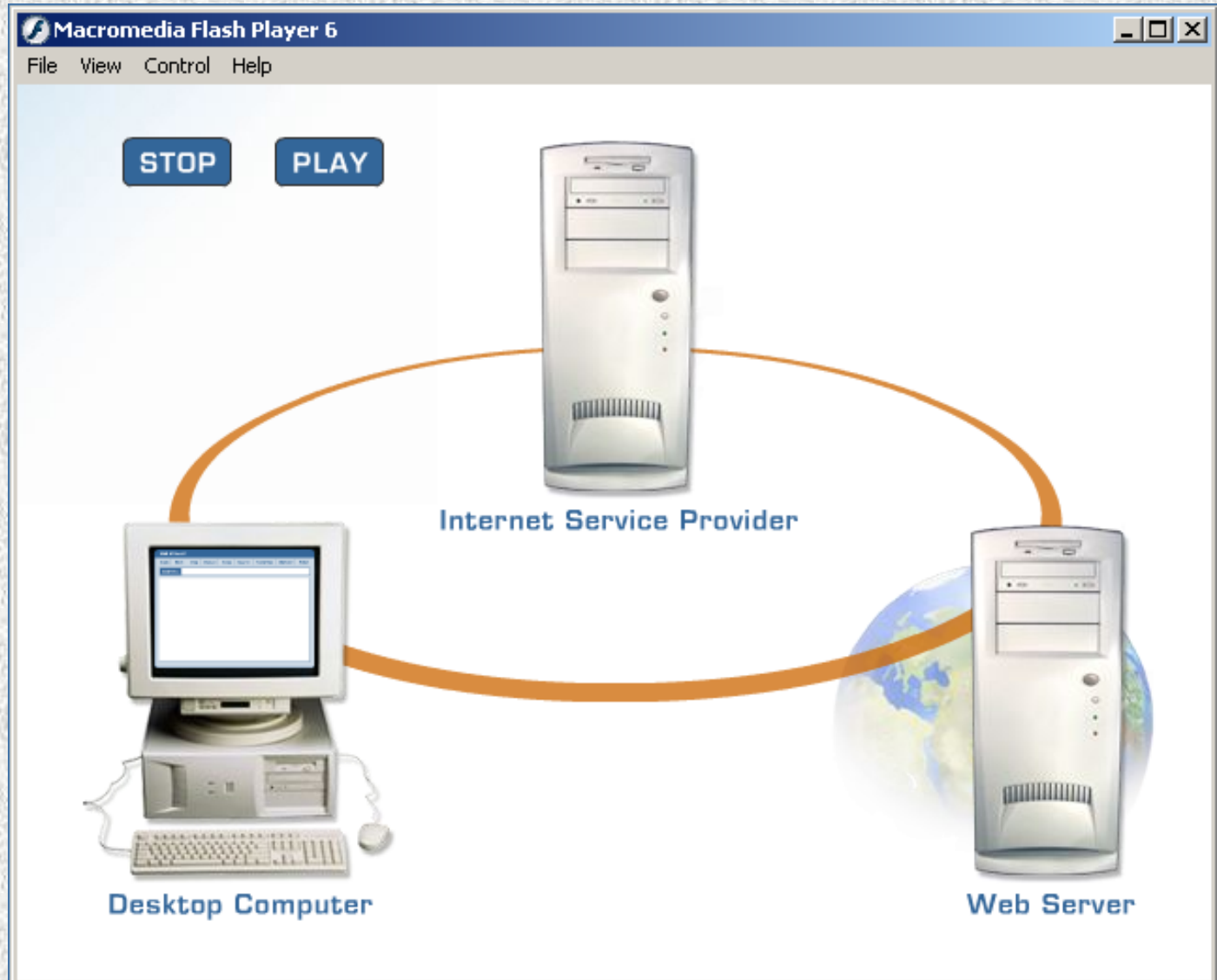
Counting Connections

- ✓ **The Internet:** an interconnected network of thousands of networks around the world
 - Links academic, research, government, and commercial institutions
 - Too decentralized to quantify
 - A network with no hard boundaries



ISPs

✓ Internet Service Providers (ISPs)



Inside the Internet

✓ IP Address:

- Every computer on Internet has a unique **IP** address
- Each address is comprised of four sets of numbers separated by periods, such as **123.23.168.22**

➤ whatismyip.com



Internet Addresses

✓ DNS (domain name system),

➤ translates **IP** addresses into a string of names:

❖ eg. bubbs.biola.edu (top-level, entity, subdomain)

✓ Top-level domains include:

- .edu - educational sites
- .com - commercial sites
- .gov - government sites
- .mil - military sites
- .net - network administration sites
- .org - nonprofit organizations

- .ca - sites in Canada
- .jp - sites in Japan
- .uk - sites in the UK (England, Scotland, etc.)
- .de - sites in Germany



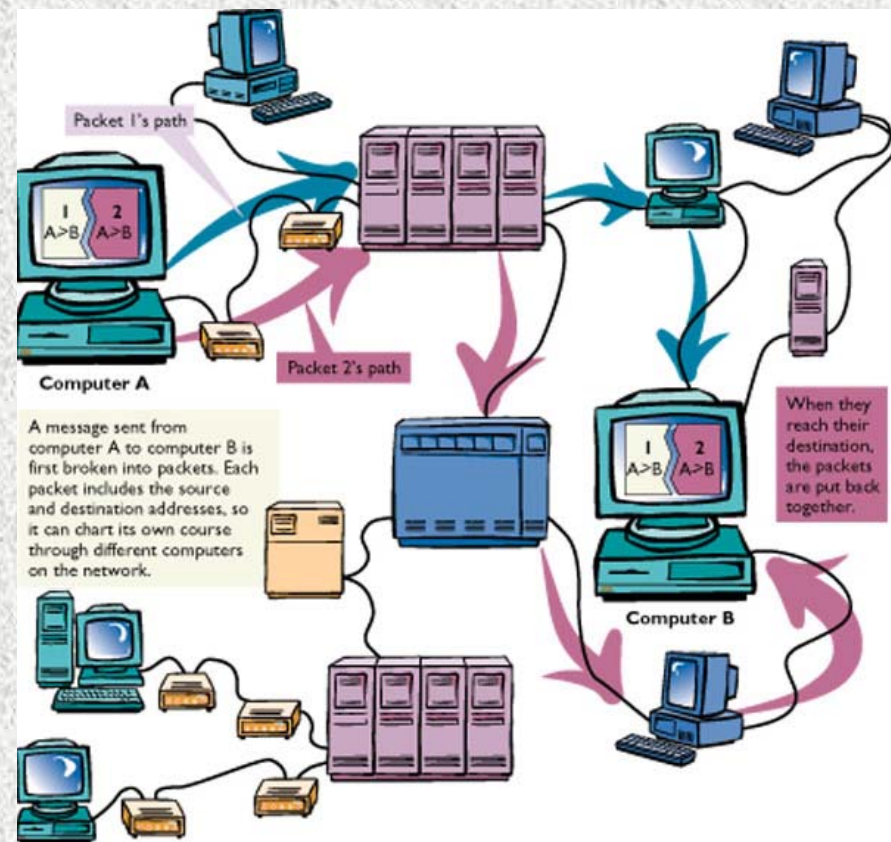
❑ tracert.com: DNS Lookup (eg. Google with IP)

Inside the Internet

Protocol: a language that computers use to transfer information among them

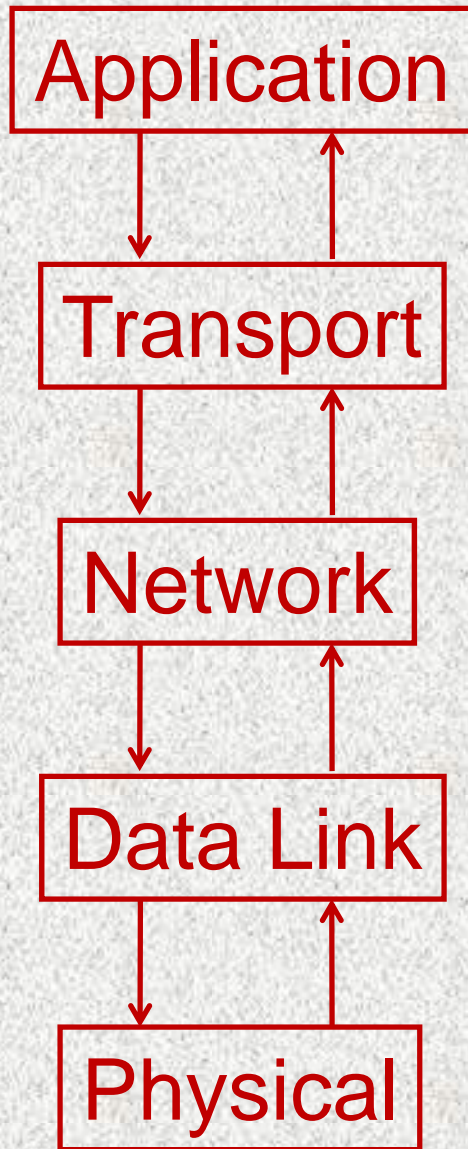
- ✓ **TCP/IP:** Transmission Control Protocol/Internet Protocol
- ✓ TCP breaks computer messages into packets

- Each packet has all the information needed to travel from network to network
- Host systems called **routers** determine how to route transmissions
- Tracert.com: ping, tracert



The TCP/IP Model

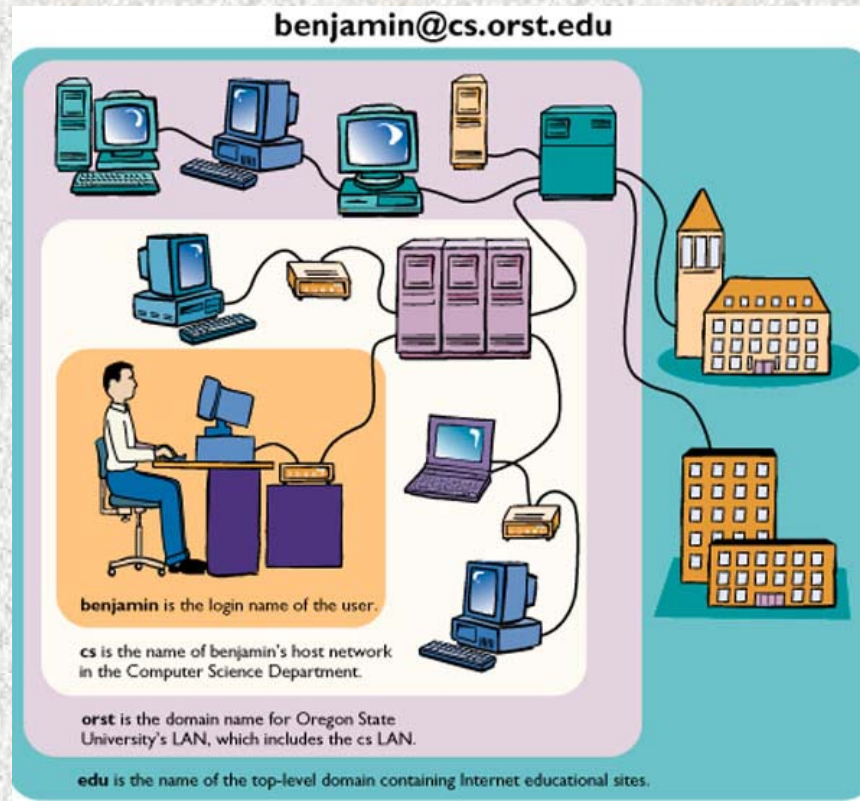
Layers



- the primary Internet services
eg. HTTP (web pages), SMTP (email)
BitTorrent (file sharing), DNS
- transfers messages between computers
eg. TCP
includes: data and requests for data
- delivers packets between computers
eg. IP, routers
 - packets “hop” from device to device
- delivers packets between two devices
eg. ethernet, dialup modem, WiFi
 - causes data to make one “hop”
- hardware: the physical components
eg. ports, cables, modems,
includes: data and requests for data

Email Addresses

- ✓ An email address includes: username@sub.ent.top
 - **sub domain** is a subdivision of a domain
 - **entity domain** identifies the organization
 - ❑ president@whitehouse.gov
 - ❑ hazel_filbert@admin.ford.com.ca



Web Protocols: HTTP and HTML

✓ WWW: World Wide Web

A system of linked documents that runs over the Internet.

With a **Web browser**, a user views Web pages that may contain text, images, and other multimedia and navigates between them using hyperlinks.

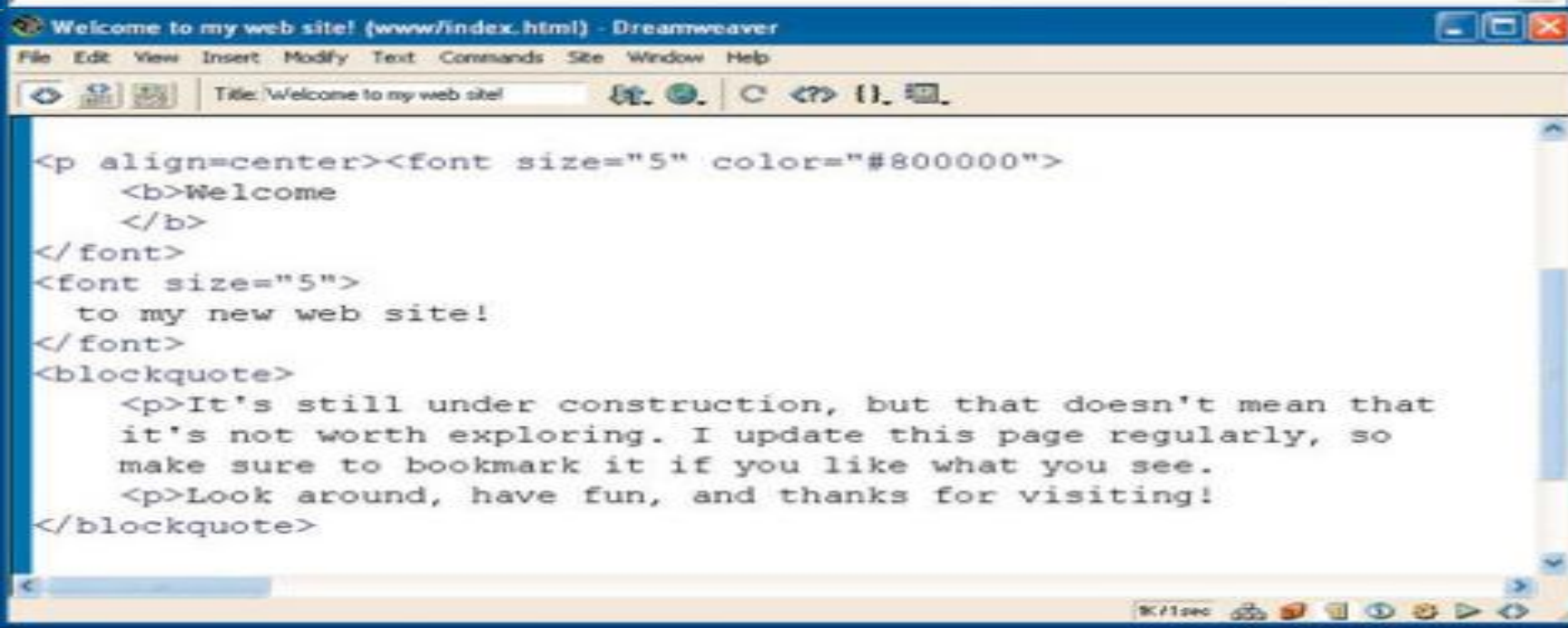
✓ HTTP: Hypertext Transfer Protocol

The computer language used to transfer Web pages from the server to the browser.

✓ HTML: Hypertext Markup Language

The computer language which makes up the content and layout of a Web page.

HTML



URL: Uniform Resource Locator

✓ **URL:** a name which identifies a specific resource on the Internet

<http://weatherunderground.com/satellite/vis/1k/US.html>

