

CS 107 Fall 2006

Lecture 6: The Internet and the Web

1 Network Activity

- Email
- Remote login. I can use my home machine from work, or post web pages on my office machine from home. To do this, I do a remote login: `slogin killdeer.homelinux.net`
- IM
- chat rooms
- The WEB is just one kind of application that “rides on” the Internet. In turn, Google and Wikipedia “ride on” the web.
- Commerce. Small businesses can market widely. Large ones can sell any time of day.
- Myspace
- Homework (SAM, course websites)

2 How It Workss

The physical part.

- A MODEM connects your computer to an ordinary phone line.
- Fiber-Optic connections (Comcast, telephone company) carry the signals to the Internet.
- Routers are computers that sit on the internet and run a piece of software called the “Internet Protocol” (IP). When a message comes into a router, it evaluates the IP address and tries to direct it to its destination the fastest way possible. Usually, the message is sent to another Internet site. Sometimes the IP address is on a local network, and the message is not sent back out to the internet.
- Some network destinations are web servers. They run software called the Hyper Text Tranfer Protocol (`http`), which handles the exchange of web pages between computers. At the destination, a browser receives the web page, written in HTML or XML, and “renders” it, that is, converts the codes to the familiar display format.
- Here are the first few lines of the HTML page for the class website:

```
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML//EN">
<html>
  <head> <title> CS 107 homepage </title> </head>
  <body bgcolor="#FCF7F0" link="#000077" vlink="#006600" alink="#660913">
    <font face="times" size="3"> <!-- -----
    <table border="2" width="720" cellspacing="0">
      <tr>
        <td height="4" width="720" bgcolor="#663300"> </td>
      </tr>
    </table>
    ...
```

Name servers, IP addresses and Uniform Resource Locaters.

There are several *root name servers* in the world. Each one is responsible for registering users in its domain. To register, you provide an IP address and the name that will be used in the URL. If you have a static IP address, you do this once. However, most computers now have dynamic IP addresses. These can change whenever the service provider needs to make a change. When that happens, the site must re-register with its name server.

- .net is used by network service providers and individuals. Example, my home server: killdeer.homelinux.net
- .com is used by businesses. Example, my son's consulting company: www.BetterITS.com
- .org is for nonprofit organizations. Example: www.truevotect.org and truevotect.org
- .gov is for government offices.
- .edu is for universities. Example: eliza.newhaven.edu

How is Yale connected to the Internet?

```
(1.20)~> host -t ns yale.edu
yale.edu name server serv1.net.yale.edu.
yale.edu name server serv2.net.yale.edu.
yale.edu name server serv3.net.yale.edu.
yale.edu name server serv4.net.yale.edu.
yale.edu name server yale-server.uchicago.edu.
```

What about UNH?

```
(1.16)~> host -t ns newhaven.edu name servers
newhaven.edu name server ns2.newhaven.edu.
newhaven.edu name server cendns1.cen.ct.gov.
```

```
(1.22)~> host -t mx newhaven.edu mail servers
newhaven.edu mail is handled by 10 mf1.newhaven.edu.
newhaven.edu mail is handled by 15 mf2.newhaven.edu.
```

```
host -a eliza.newhaven.edu
Trying "eliza.newhaven.edu"
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 61324
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 2, ADDITIONAL: 1

;; QUESTION SECTION:
;eliza.newhaven.edu.          IN      ANY

;; ANSWER SECTION:
eliza.newhaven.edu.         8677   IN      A       192.132.64.186

;; AUTHORITY SECTION:
newhaven.edu.              86146  IN      NS      ns2.newhaven.edu.
newhaven.edu.              86146  IN      NS      cendns1.cen.ct.gov.

;; ADDITIONAL SECTION:
cendns1.cen.ct.gov.        849    IN      A       159.247.233.2
```