Networking At UW, The Internet And Beyond

CSE 100

Various computers will be used in this class, so a quick introduction to their arrangement and networking is useful. Along the way we answer the pressing question: What *is* the difference between the Internet and the World Wide Web

CSE 100 Accomplishments To Date …

- You have a UWNetID that gives you access to the UW's computers, but also access to the World Wide Web … your account is on Dante
  - You have sent email, set up folders, set up an address book
  - You have visited home pages for UW, CSE100, other sites
  - You have tried out a search engine
- Other things you should find out about …
  - Printing is possible for most computer applications … how do you use the printers at OUGL or SUZ labs?
  - In Pine, it is possible to "postpone" a mail message that you are writing -- that is, set it aside to use Pine in other ways and then return to it. Try out "postpone" in your next mail.

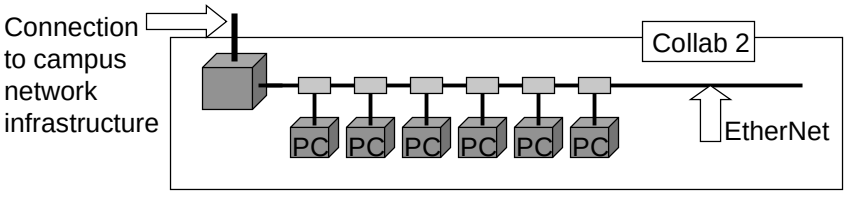
Factoid: Pine was developed at UW and is used worldwide

CSE 100 Computers ...

- We will discuss how computers really work later, but for now think of them as having many forms
  - Embedded -- processor, ROM, channels to sensor/actuators; µoven
  - Laptop -- processor, RAM, floppy disk, harddisk, LCD; mobility
  - Desk Top -- processor, RAM, floppy, harddisk, CD, CRT; office work
  - Server -- processors (4-32), RAM, many harddisks, CD; services
  - Supercomputer -- processors (16-1K), RAM, harddisks; big science
- CSE100 uses
  - Laptop for lectures
  - Desktop in Collabs, OUGL, SUZ
  - Dante server
- An unconnected computer can only access the data stored locally, run the software stored locally, etc.

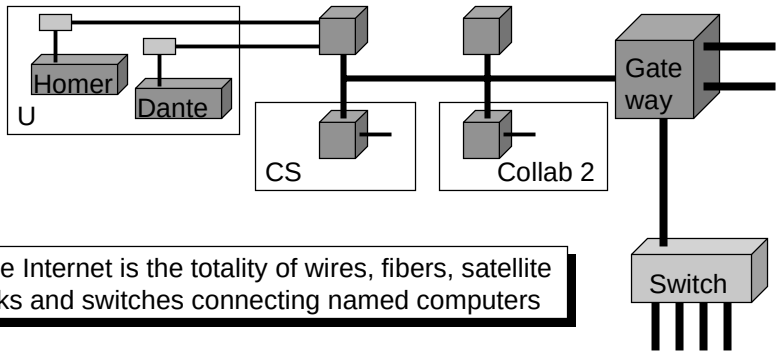
CSE 100 Networks ...

- Networks connect computers, making them much more useful because
  - Access more information and software
  - Help users communicate, share information
  - Perform services for one another
- UW's networks move 1/2 trillion bytes of data per day
  - Half this information goes to or comes from the Internet
- How are these networks arranged?



CSE 100 UW Networks Connect To Internet

- The subnetworks of campus interconnect the computers of the UW domain (.washington.edu), which is connected to the Internet via a Gateway



The Internet is the totality of wires, fibers, satellite links and switches connecting named computers

CSE 100 How Are Computers Named

- The *logical* way to name computers is using domains
  - All educational institutions .edu
  - U Dub .washington.edu
  - CSE .cs.washington.edu
  - Me spiff.cs.washington.edu
- The *physical* way to name computers is using an internet protocol address, or IP address
  - spiff.cs.washington.edus IP address is: 128.95.1.207
  - cs.washington.edu's IP address: 128.95.1.4
  - washington.edu's IP address: 140.142.15.163
- A domain name server (DNS) looks up human readable names and converts them to IP addresses for the Internet routers

Top Level
.com
.edu
.gov
.org
.mil
.net
.*xx*

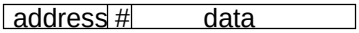
CSE 100 Logical Network … Physical Network

An important concept ...

- In computing it is common to separate the *logical* idea of something -- the way you think about it -- from the *physical* implementation -- how it's built
- This is called a physical / logical separation
- In networking, the domain names make up our logical network, a hierarchical arrangement of names that tell us associations: cs.washington.edu
- The computers actually use physical addresses
- The DNS enables the separation by making the correspondence between the two

CSE 100 Transmitting Information

- How is the information sent?
  - Information -- email, web pages, phone calls, etc. -- are broken up into small units, called packets
  - Think of sending a long message to a friend in Australia using postcards … write a few sentences on each postcard, number them as you write them, and mail
  - Your friend gets lots of postcards, probably on different days and out of order, and so must reassemble them to put the message back together
  - This scheme is called the Transmission Control Protocol and Internet Protocol, or TCP/IP



CSE 100 World Wide Web

- The world wide web is composed of those computers, called web servers, capable of sending information to your browser, e.g. Netscape
- In most domains the computer that is the web server is called “www”, e.g. www.washington.edu
  - But, a web server can have any name … your pages will be served by students.washington.edu
  - The actual pages can be stored somewhere else, e.g. Dante
- There are different ways to connect to these servers
  - Hyper-text transfer protocol, http for web pages
  - File transfer protocol, ftp for files of information

Factoid: “WWW” is not short for “World Wide Web”

CSE 100 Web Pages

- Web pages are just text files containing instructions to your browser on how to lay out the web page
  - Web pages can be created with a text editor
  - Web pages can be created with tools, Front Page Express
- Web page files are written in a special language, hyper-text mark-up language, HTML
- It is possible to see the HTML that is producing the page you are looking at by selecting “source” from the View menu in your browser

CSE 100 HTML From CSE100 Home Page

```
<HTML>
<HEAD>
<META HTTP-EQUIV="Content-Type" CONTENT="text/html; charset=windows-1252">
<META NAME="Generator" CONTENT="Microsoft Word 97">
<TITLE>Home Page</TITLE>
</HEAD>
<BODY LINK="#0000ff" VLINK="#800080" BGCOLOR="#ffffff">

<DL>
<DT><A NAME="top"></A></DT>
</DL>
<TABLE CELLSPACING=0 BORDER=0 CELLPADDING=10 WIDTH=702>
<TR><TD WIDTH="21%" VALIGN="TOP" ROWSPAN=4 BGCOLOR="#c0c0c0">
<P><A HREF="#Announcements"><I><FONT FACE="Verdana, Helvetica" SIZE=2
COLOR="#ff0000">Announcements</I></FONT></A></P>
<P><A HREF="vision.htm"><B><FONT FACE="Verdana, Helvetica" SIZE=2>CSE100
Vision</B></FONT></A></P>
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Tests</B></FONT></A></P>
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Caution: Not for human consumption