

Announcements

- Suggested problems
 - Chapter 1: 4, 5, 8, 13, 22
- Reading for next week
 - Chapter 2: sections 2.1-2.3
- Dr. Hollingsworth's Office Hours This Week
 - Th 10:45-12:00

Project #1 Notes

- Small bug in the sample code (Postscript handout)
 - near line 48: `memset((void *) &server, sizeof server)`
 - should have a second argument of zero
- Use of `netstat`
 - don't forget it is installed in `/usr/sbin/netstat`
 - the “-f inet” option is useful for restricting output to IP only
- might want to look at man page for `sendto/recvfrom`

Arpanet

- First “public” wide area network
- Ideas Pioneered
 - packet switching
 - internetworking
 - radio, wire, satellite
 - build it before you standardize it!
 - many routing, congestion control, and management ideas
- Dates: 1969-1987
- How to get connected: have a DOD Arpa Contract
- Technology
 - 56 kbps dedicated links
 - custom built network switches (called IMPS)

NSFNet

- First general audience “public” wide area network
- Ideas Pioneered
 - wide area networking for the masses
 - TCP/IP Wan
 - backbone wide area network connecting regional nets
- Dates: 1984-1995
- How to get connected: be an academic site and join a regional network
- Technology
 - 448kbps - 45 Mbps
 - general purpose workstations as routers

Internet

- Ideas Pioneered
 - multi-vendor public networks
 - if you build it they will come!
- Dates: 1983- (TCP/IP protocol first used)
- How to get connected: stop by the mall, call 1-800...
- Technology
 - 9.6kbps to OC-48 (2 Gbps)
 - soon higher AND lower speeds will be supported
 - custom routers from many vendors
 - general computers for some routing

Gigabit Testbeds

- The Internet was taking, now what is next?
- A series of small projects to test new ideas
 - a “government gigabit” (622 Mbps)
- Issues:
 - the speed of light is fixed
 - round-trip coast to coast is 40msec
 - need for very high speed point-to-point connections
 - tele-medicine
 - video
 - coupling high-end computational resources

Telco Data Networks

- X.25
 - low speed (up to 64kbps) packet switched network
 - provides connection oriented services
 - call an end-point and hold the connection
- ISDN
 - slow speed (up to 128kbps) network
 - runs over a single copper pair
 - still connection oriented
- B-ISDN
 - higher speed version of ISDN
 - connection oriented