Chapter 8 – Nature of Computing

Networking and Telecommunications

"BATTLE OF NEW ORLEANS" New Orleans, 1815 Herbert Morton Stoops
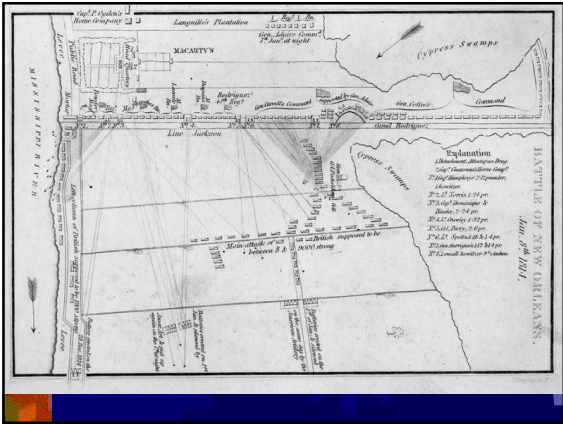
Aug 19, 1991

Well, let me say that Mikhail Gorbachev is now on vacation. He is undergoing treatment, himself, in our country. He is very tired after these many years and he will need some time to get better."

Gennady Yanayev, speaking at a press conference during the August Coup.
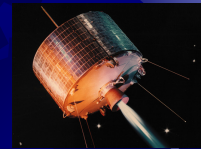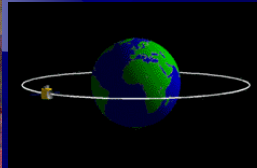
Boris Yeltsin

Earth Orbit

- LEO – Low Earth Orbit
  - Space Stations, shuttles
  - 200-400 miles above ground
  - About 100 minutes to go around the earth
- Moon
  - 240,000 miles above ground
  - 30 days to go around

Earth Orbit - Geostationary

- 22,300 miles above ground
- 23 hours, 56 minutes to go around earth
- About 300 geostationary satellites in operation

Kinds of Networks

- LAN – local area network
  - Usually in the same building
  - Computers, printers, peripherals
- WAN – wide area network
  - Extends over larger distances
  - Usually private, linking offices

Specialized Networks

- GPS – Global Positioning System
  - 24 satellites – computer, clock, radio
  - Four satellites above horizon at any time
- Financial Networks
  - Run ATM's
  - Money as another form of information

Network Interface

- Ethernet
  - Network architecture developed at Xerox PARC in 1970's.
  - Most common type of network today
  - Direct connection

Remote Connections

- Modem
  - 56.6K bps (56,600 bits per second)
  - Uses telephone lines
- Broadband connections
  - DSL (digital subscriber line) – phone lines
  - Cable Modems – cable lines
  - High-speed wireless
  - Satellite dishes

Remote Connections

- Fiber-Optic Connections
  - Uses light waves
  - 500,000,000 bps
  - Replaces 10,000 copper telephone cables
  - Currently the backbone of the internet
  - Copper cables are then the "last mile"

Wireless Network Technology

- Infrared wireless
  - Line-of-sight
  - Laptops, palm computers
  - Remote controls
- Wi-Fi, 802.11
  - Most common wireless technology
  - Range: 150 feet
  - What Biola uses

Wireless Network Technology

- Bluetooth
  - Range: 30 feet
  - Intended to replace wires that connect peripherals
  - Cell phones, PDA's, printers
- PCS – personal communication services
  - FCC Recently authorized frequency
  - Digital cell phone network
  - Example: Verizon Wireless EV-DO