Announcements

• Handouts
  – class syllabus
  – programming assignment #1 (includes computer account)
  – department newsletter

• Required Background
  – must have 311, 251 and 330 (412 or 430 would be helpful)
  – strong working knowledge of Java
  – willingness to work hard
Announcements (cont.)

• Required Work
  – will require about the same amount of effort as 412
    » 412 a (slightly) harder project to debug
    » 417 project is (by design) more ambiguous

• Materials

• Reading (for this week)
  – Chapter 1
Networks

• Communication between semi-autonomous computers
• Attached to host system by an adapter
Many Types of Networks

• Physical Media
  – copper wires (Ethernet, RS232-C, V.32, etc.)
  – fiber optics (ATM, FDDI)
  – air (IR, Radio, micro-wave)

• Speeds (link not aggregate)
  – low
    » modems (few k bits/sec)
    » pagers
  – medium
    » Ethernet (10-100 Mbps)
    » Token Ring (16 Mbps)
  – high
    » ATM (155-655 Mbps)
    » Myrinet (600-1200 Mbps)
    » SONET (OC-48 - 2488 Mbps)
Network Topologies

- How are the communicating objects connected
- Fully connected - link between all sites
- Partially connected
  - links between subset of sites
  - can be an arbitrary graph
- Hierarchical networks
  - network topology looks like a tree
  - internal nodes route messages between different sub-trees
  - if an internal node fails, children can not communicate with each other
  - star network - hierarchical network with single internal node
Network Topologies

- Tree
- Mesh
- Star (Ethernet 10Base-, physical only)
A Network is not an Island

• Reason for networks is to share information
  – must be able to communicate in a common language
  – called protocols
    » The nice thing about protocols is that there are so many of them!

• Protocols
  – must be unambiguous and followed exactly
    » rule of thumb for good protocol implementations
      • be rigorous is what you generate
      • be liberal in what you accept
  – there are many different aspects to protocols
    » electrical through web services