Announcements

- **Handouts**
  - class syllabus
  - programming assignment #1

- **Enrollment**
  - there are 43 people in the class, and 26 on the wait list
  - due to the size of the room and projects enrollment will not be increased
    - priority to fill drops will be given to senior CS undergrads
  - this class will be offered again next fall and spring

- **Required Background**
  - must have 311 and 330 (412 or 430 would be helpful)
  - strong working knowledge of C or C++ (take your pick)
  - willingness to work in a group environment
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
  – will need to write project proposals plus the code

● **Materials**
  – Handouts from Web page
  – Reserve materials in Engineering library

● **Reading (for this week and next Tuesday)**
  – 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 (10 Mbps)
  - high
    - ATM (155-655 Mbps)
    - Myranet (600 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
Layering

- Layers provide information hiding
  - doesn’t matter what lower level layers use as long as higher layers speak the same protocol.