

CSMC 417

Computer Networks

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Set 1

Announcements

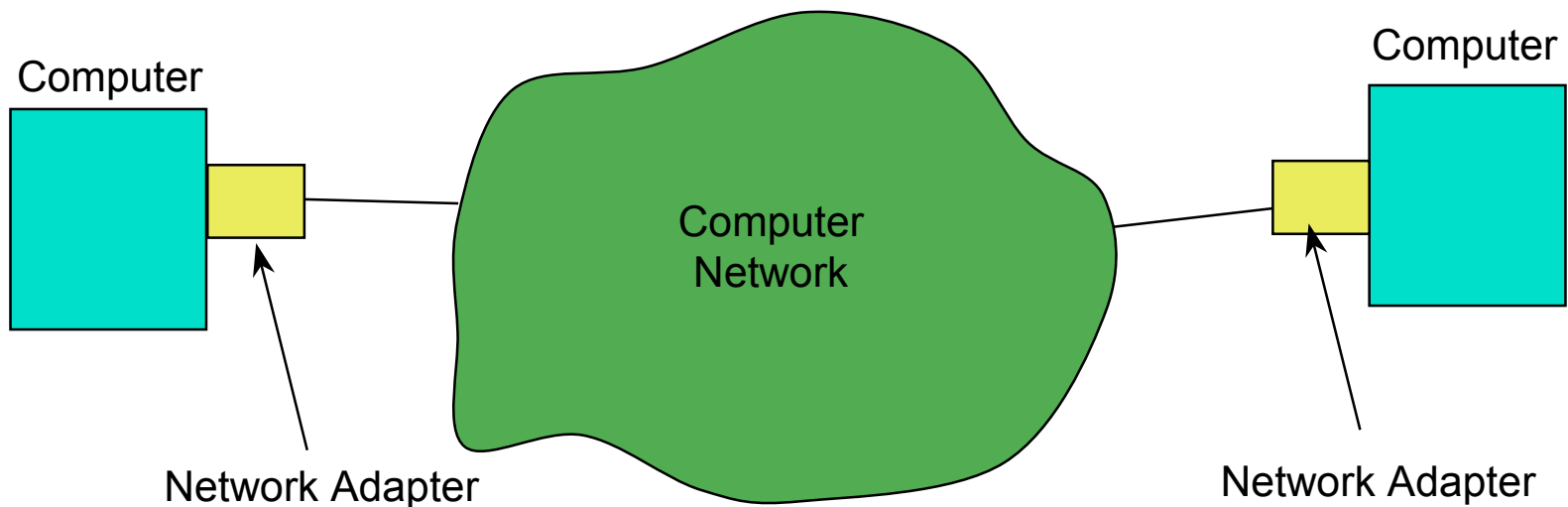
- **Handouts**
 - class syllabus
 - programming assignment #1 (includes computer account)
 - department newsletter
- **Required Background**
 - must have 311, 251 and 330 (412 or 430 would be helpful)
 - strong working knowledge of Java
 - willingness to work hard

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**
 - Tanenbaum, “Computer Networks”, 4th Edition
- **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

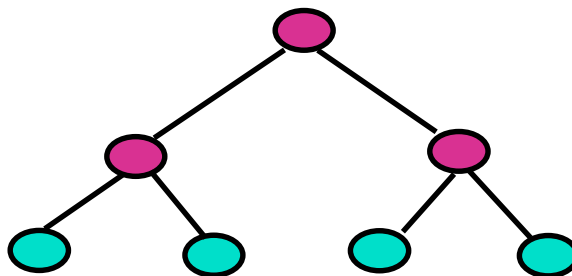


Network device

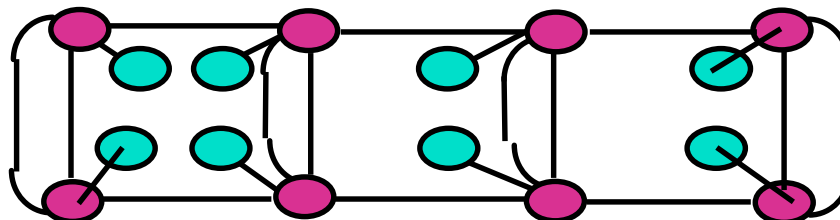


Processor

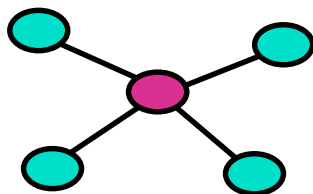
- **Tree**



- **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