Ateneo Cervini-Eliazo Network

Networking Devices

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30 January 2001
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Section I

Networking
Networking

★ the art and science of transmitting data

★ involves protocols, devices and many other components

★ Traditional Networking - the connection of several dumb terminal to a central mainframe over low-speed lines

★ Modern Networking - the interconnection of several computers, devices and peripherals
Network

★ is a utility

★ Computers and their users are customers of the network utility
★ The network must accommodate the needs of the customers
★ Resources will be used to manage the network
★ There is a cost for installing and maintaining the network
★ Manpower is required to support the network
★ It is an expense item
★ Cannot justify Network based on productivity improvements

★ can save money or improve the business

★ If the company cannot get the information your customers are asking for due to a network that is down, they may go to your competitor
★ If users cannot log on to your commerce site, they will try a competitors site
★ A network really can be thought as of three things and they all need to be considered when working on a network design project

★ Connections

★ Communications

★ Services
Connections

★ Provided by Hardware that ties or connects things together:
  ★ Media Transport Mechanisms
  ★ Routers
  ★ Switches/Hubs
  ★ Computers
Communications

★ Provided by Software

★ Common language for 2 systems to communicate with each other:
  ★ TCP/IP (Internet/Linux/Unix)
  ★ IPX / SPX (Novell Netware 4)
  ★ AppleTalk (MacOS)
  ★ NetBeui (MS)
Services

★ The Heart of Networking
★ Cooperation between 2 or more systems to perform some function -
   Applications:
   ★ telnet
   ★ ftp
   ★ http
   ★ SNMP
   ★ UDP
   ★ etc...
Section II

LAN/WAN
LAN

- Connect workstations and personal computers
- A computer network that spans a relatively small area
- Usually are confined to a single building or group of buildings
- Enables many users to share expensive devices, such as laser printers, as well as data
**WAN**

- A computer network that spans a relatively large geographical area
- Consists of two or more local-area networks (LANs)
- Often connected through public networks, such as the telephone system, leased lines, satellite and other media
- The largest WAN in existence is the Internet
Considerations

★ topology - the geometric arrangement of devices on the network
★ protocols - the rules and encoding specifications for sending data
★ media - devices can be connected by twisted-pair wire, coaxial cables, fiber optic cables and even thin air
Topology

Star

Bus

Ring
Protocols

★ agreed-upon format for transmitting data between two devices
★ determines the following:
  ★ the type of error checking to be used
  ★ data compression method, if any
  ★ how the sending device will indicate that it has finished sending a message
  ★ how the receiving device will indicate that it has received a message
Media

★ devices on which data can be stored such as hard disks, floppy disks, CD-ROMs, and tapes

★ cables linking workstations together

★ format and technology used to communicate information such as media, video and others
Section III

Common Devices
Hubs

- are used to connect hosts into a single network
- typically a layer 1 device that simply broadcasts all packets from all sources
Switches

- are used to connect hosts into a single network, but are usually used to connect networks to networks.

- typically a layer 2 device sends the packets to its appropriate host/network only and not to all the networks/hosts attached to this device.
Types of Switches

★ Store and forward Switch
  ★ Accepts a frame on input line
  ★ Buffers it briefly and does a CRC check
  ★ Routes it to appropriate output line

★ Cut-through Switch
  ★ Begins repeating the frame as soon as it recognizes the destination MAC address
  ★ Higher throughput, increased chance of error

★ Fragment Free Switch
  ★ Accepts the frame on the input line
  ★ Does a CRC check only on the header frame
  ★ Routes it to the appropriate output line
  ★ Fastest method currently available
Advantages of Hubs/Switches

★ No modifications needed to workstations when replacing shared-medium hub/switches
★ Each device has a dedicated capacity equivalent to entire LAN
★ Easy to attach additional devices to the network
Section IV

Conclusion