

# Ateneo Cervini-Eliazo Network

## Networking Devices



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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

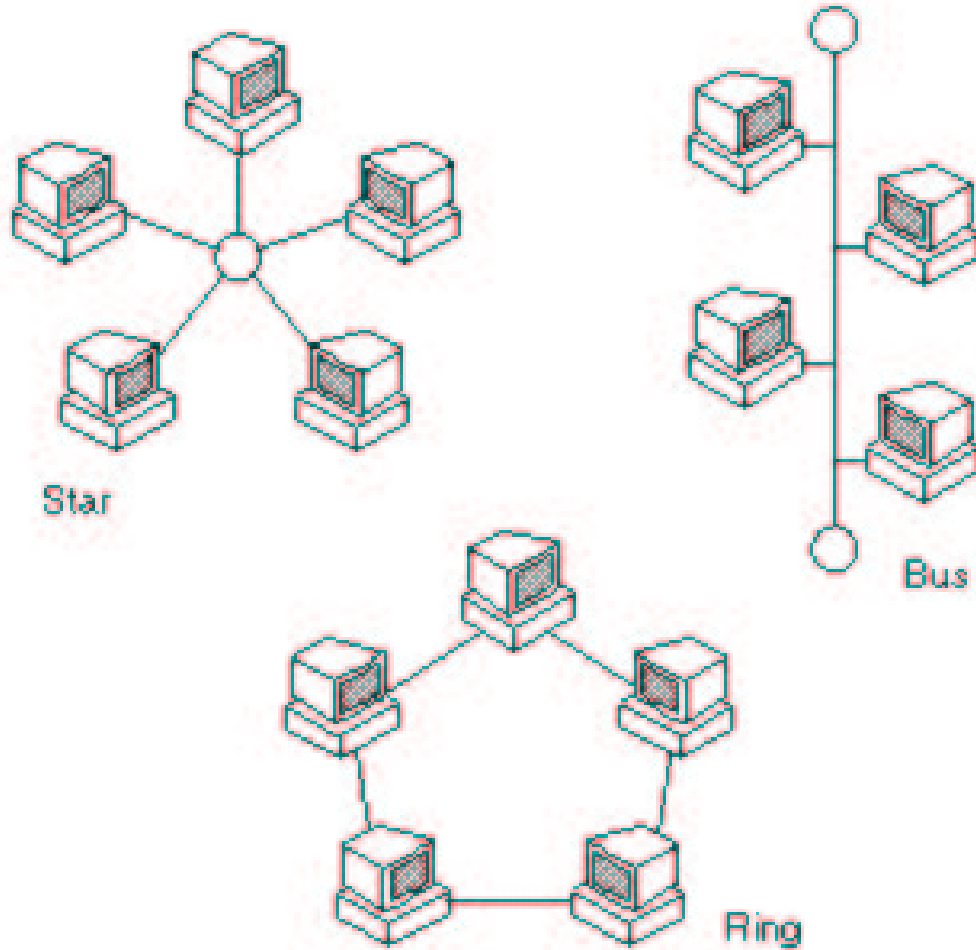
## WAN

- ★ 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 is 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



## 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

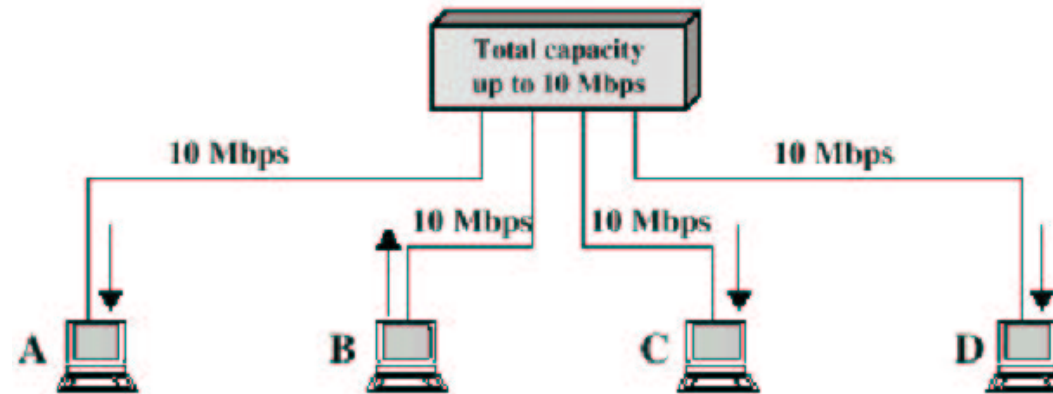
## Media

- ★ 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

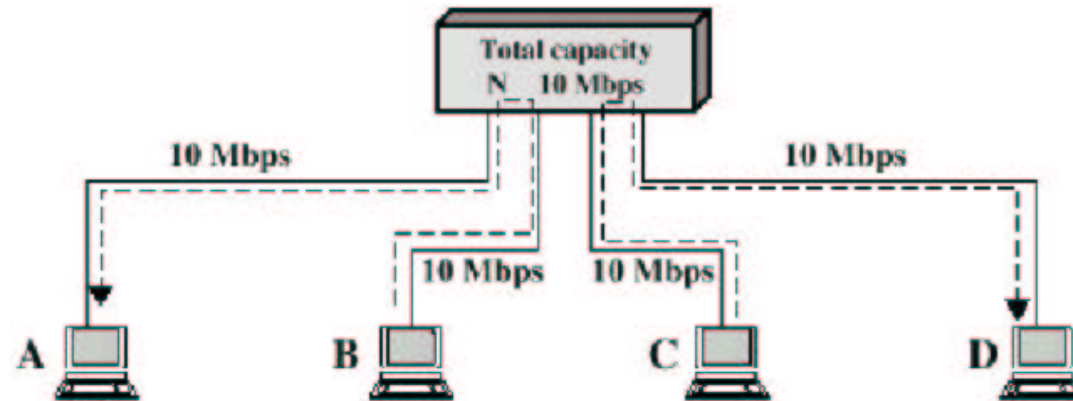
# Common Devices

## 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



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