Topics

• Discussion: Educational Networking
• Network Topologies
• TCP/IP
• Internet Connections
• Bandwidth and Throughput
• Service Types
• Assignment 2
Topologies

• Star
  – Cascaded Star
  – Twisted Pair Ethernet

• Ring
  – Token Ring

• Bus
  – Thin and Thick wire Ethernet (coax)
Network Logical Sizes

- PAN
- LAN
- SOHO
- CAN
- MAN
- WAN
Ethernet

- Access Method
- Xerox mid-1970s
- CSMA/CD
- IEEE 802.3
  - Standard for sending packets of data (frames)
  - p 108 shows an example
TCP/IP

- Transmission Control Protocol
  - Provides reliable end-to-end transfer between two processes

- Internet Protocol
  - Provides the process of accepting then sending segments of data (frames or packets) between hosts computers or gateway across a interconnect set of networks.

- Internet
  - This interconnected set of networks is called the Internet.
IP

- IP Address
  - ID for the computer on the TCP/IP network
  - Different than the MAC Address
  - 32 bits ($2^{32} = 4,294,967,296$ addresses)
  - Displayed as 0-255.0-255.0-255.0-255
    - 128.129.111.1 (four decimal numbers separated by periods)
  - In order to organize we break the IP address into Network and IP Address
  - Allows for easier routing

- Subnet Masks
  - Strips out the network and leaves the host IP
Example

- `elm.cecs.unt.edu`
- `IP: 129.120.118.210`
- `Submask: 255.255.255.0`
- `Gateway: 129.120.118.250`
- `DNS: 129.120.210.254`
The Internet
Other Topics

- UDP (User Datagram Protocol)
- IPv4
  - 4.2 billion addresses
- IPv6
  - 128 bit addr, \(655,570,793,348,866,943,898,599\) per sqr meter of the Earth’s surface
- Mobile IP
- QOS (quality of service)
- RSVP (Resource Reservation Protocol)
- DHCP (Dynamic Host Configuration Protocol)
  - Discovery, Offer, Request, Ack
  - Lease System, provides better sharing of limited network resources
Internet Connections

- Dialup
- ISDN
- DSL / ADSL
- Cablemodem
  - DOCSIS (Data Over Cable Service Interface Specifications)
- Commercial Means
  - T1, OC3, Fiber Backbones
- Service Types by Speed
Internet Services and Networking

• Services
  – Web (HTTP), E-mail (SMTP), File (FTP), Command (Telnet), etc

• Service impacts
  – System hardware
    • Servers, Disk Space, etc
  – Network
    • data transfer
    • Bandwidth
Assignment 2

• Articles: Web Services use in Education

• Web
  – Edit httpd.conf
    • Located in /etc/httpd/conf
    • Edit httpd.conf
    • Enable personal web pages
      – #UserDir disable (comment this line)
      – UserDir public_html (remove #, uncomment)
    • Using “services” start or restart httpd service, save changes
  – Test: Run a Browser and Access your server
  – Configure system page
    – Create an index.html file (see example next slide)
    – Located in /var/www/html
    – System Home should provide info about the server and provide links to each user on the system.
  – Test: Use Browser to Access new System Home Page
Assignment 2

- For Each User
  - Located in /home
  - For each User directory
    - Set the permission to EXECUTE for User, Group, Other
  - Within each user dir
    - Create a directory called “public_html”
    - Change owner to the user account
    - Set permission to READ, EXECUTE for User, Group, Other
  - Create a test index.html inside the public_html directory
- Test: Use Browser to Access new System Home Page
  - http://yourserver/~account
Example index.html

<html>
<body>
<h1>Name</h1>
<a href="http://system.edu/~user">Name</a>
</body>
</html>