CSC 121 Chapter 3 Notes

* Internet is a vast, international network of computers
* Licklider became head of computer research at the U.S department of Defense (DARPA)
  + APRANET created in 1969
    - Connected computers at UCLA, UCSB, SRI, and Utah
    - Dedicated cables, buried underground
    - Data transfer rate was 56,000 bits/second, same as dial-up services today
    - Intended to connect only military installations and universities participating in government projects
      * By 1970, 18 sites connected
      * Most used had capability of 4 terminals per site
    - In 1980s grew a lot due to interest in email, newsgroups, remote login
      * By 1984, more than 1000 sites were connected to APRANET
      * NSF became involved with APRANET in 1984
        + Funded construction of high-speed transmission lines that would form the backbone of the expanding network
  + Internet was new name given because the similarities between NSFNET and interstate highway system
  + Became privatized in the 90s
    - Networks hardware was turned over to telecommunications companies and research organizations (AT&T, Verizon, CenturyLink, Sprint)
    - Research and design are administered by the Internet Society
* Internet Society
  + International nonprofit organization
    - Maintains and enforces standards, ensuring that all computers on the internet are able to communicate with each other
    - Also organizes committees that propose and approve new internet-related technologies and software
  + Growth of internet slowed if you only count traditional computers
    - Since 2010, huge growth with non-traditional deices (mobile devices, embedded devices)
* Distributed networks
  + Design of APRANET was influenced by ideas of Paul Baran, researcher at RAND Institute
    - Proposed 2 key ideas: distributed network and packet-switching
    - Needed to be resistant to attack and mechanical failure
* Packet Switching
  + Messages are broken into small pieces known as packets
    - Packets are sent independently to their final destination
  + Sending information in smaller unites increases the efficient use of connections
    - Large messages can’t monopolize the connection
  + Transmitting packets independently allows the network to react to failures or network congestion
    - Routers can recognize failures and reroute packet
* Internet control
  + Two central protocols that control Internet communication are
    - Transmission Control Protocol (TCP)
      * Controls the method by which messages are broken down into packets and then reassembled when they reach their final destination
    - Internet protocol (IP)
      * IP address is number, written as a dotted sequence
      * Dynamic IP addresses
      * Concerned with labeling the packets for delivery and controlling the packets path from sender to recipient
* DNS
  + Domain name servers are computes that store mappings between domain names and Ip addresses
    - Domain names are hierarchical names for computers, they are much easier to remember and type than IP addresses
    - Domain name servers translate the names into their corresponding IP addresses