Final exam

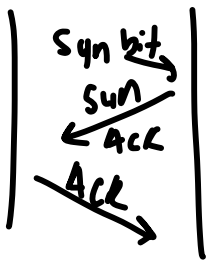
- Close-book/notes
- Wednesday 12/11, 8-9:50am
- Questions similar to midterm exam
  - Multiple choice (6 question 16 points)
  - Matching (4 question 20 points)
  - Completion (7 question 24 points)
  - Short answers (4 question 40 points)
- Chapters 3,4, 6, 7 & 8
- Review quizzes & homework problems

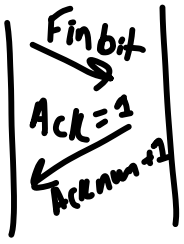
Chapter 3

- Starting from slide 3-92 Chapter3-Covered
- Flow control & congestion control
- TCP connection management

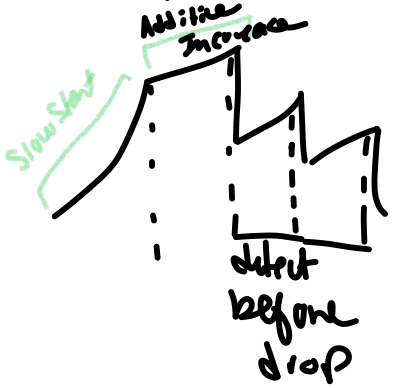
→ TCP flow control allows sender to not overwhelm the recievs buffer. Done by reciver Sending its free buffer size in the TCP header.

TCP Congestion Control instead reduces the senders data sending rate by reducing the sending window size when an loss detected.





ssthresh = 1/2 cwnd just before loss event



Chapter 4

- Key networking-layer functions
  - Forwarding & routing
  - Longest prefix matching
- Subnet and IPv4 addressing
  - CIDR: a.b.c.d/x
  - DHCP
- NAT: Network Address Translation

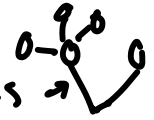
Forwarding = local, Routing = Global

↳ move packets from router input link to output link

↳ determine route of packet source to destination

↳ match Longest to Table

IPv6 = 128



Remember to count the sticks also

Count R to L till get to zero, then choose that #

DHCP returns: Addr on first hop router for client, name & IP Addr of DNS server

network mask

↳ Quiz 9 diagram

Http port 80

Transport

Chapter 6

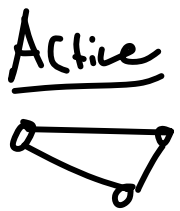
* Link layer has responsibility of transferring datagram from one node to physically adjacent node over a link

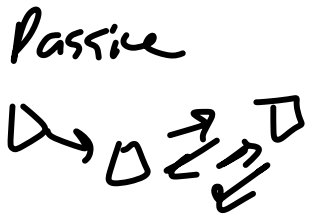
- Link layer services
  - Framing, Reliable Delivery, Flow Control, Error Detection, Half/Full duplex
  - *Parity [1 2 2 0]
  - CRC :)
- Multiple Access protocols
  - MAL = 48bits
  - Categories and example protocols
    - MAP Categories [• Point-to-point • Broadcast]
    - Random Access
    - Taking Turns
    - Channel Partition
- Address Resolution Protocol
- Switches

- link layer
  - Transparent
  - Store N Forward
  - Plug & Play - Self Learning
- flooding

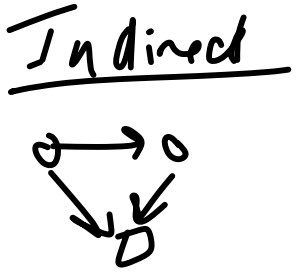
Chapter 7

- CDMA - Do the bits / Explain steps
- WiFi 802.11
  - Passive/Active scanning





  - Collision avoidance
- Mobility — RTS-CTS: Request to Send / Clear to Send
  - direct routing & indirect routing



Chapter 8

(Confidentiality, Integrity, Availability)

- Network security (CIA triad)
- Symmetric key and public key schemes
- Certification Authorities (CA) (Binds public key to entity, proof of identity)
- Securing emails
  - Confidentiality, integrity, authentication
- TLS vs. IPSec
- Firewall
  - Three types

- Stateless: filters packet by packet
- Statefull: tracks every TCP connection
- application: Filters IP/UDP, TCP