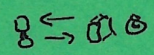
6560843
Midterm
Cheat Sheet

TCP - ~~Transmission Transfer~~ Control Protocol

UDP - User Datagram Protocol

RTT - Round Trip Time 

Packet Switch - Fwd Packets

Circuit Switching - reserved resources for a session

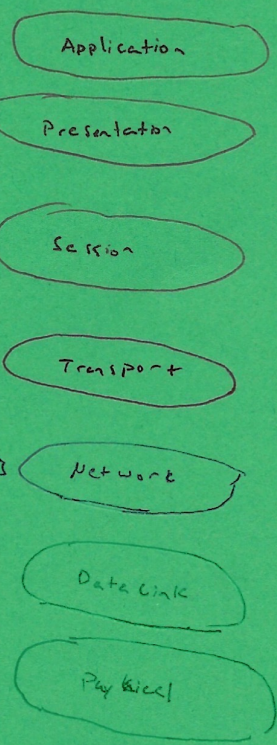
Packet Switching - x conn sending over the same route

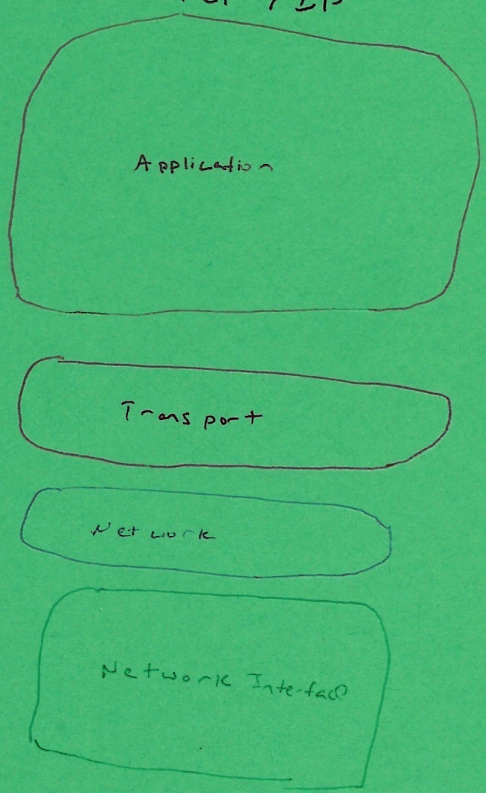
Processing Delay - Time req to examine the packets header & determine where to dir the packet. Any time before a packet is queued

Queueing Delay - Time req for a packet to sit in a queue before being process. no Really

Transmission Delay - delay caused from waiting for all packets in a given msg to arrive before send is called Trans Delay

Propagation Delay - Time taken for a packet to go from the begging of the link to the router





Packet Switching vs. Circuit Switching

Packets are shared and sent across the same resources & the same wires. Packets need to be buffered & queued which means they can be overwhelmed & data can be lost

Reserves network resources for the duration of a conn

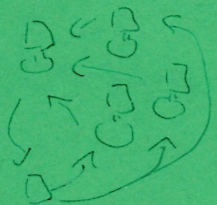
FDM or TDM

FDM freq spec of a ring is ÷ among conn

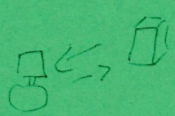
TDM is ÷ into frames and each frame is ÷ into a # of time slots

P2P vs. Client Server

- 1 client, all others act as servers, client acts as both for diff transactions



- 1 client / server



TCP vs UDP

- Reliable
- Net Cong Ctrl

- Fast

HTTP

Persistent vs non-persistent

parallel DWLD, X obj req < X

automatically sends req objs in order they were recvd. x obj req x conn

DNS - Domain Name Server is UDP based service which maps user friendly names to IP addresses

CDN - Content Distribution Networks are Distrib servers for content platforms which contain diff versions of files for diff quality of video based on Net Perf

DASH - CDN Based Protol for dynamic quality streaming

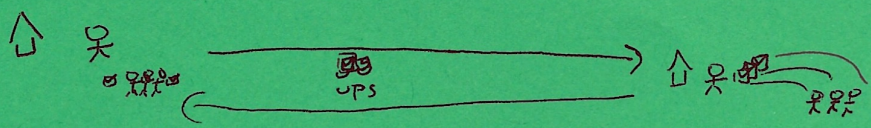
SMTP - Email server to server transmission
POP 3 + IMAP are client email server comm

d_{trans}: Transmission Delay $= \frac{L}{R} = \frac{\text{Packet Length}}{\text{Transmission Rate}}$

d_{prop}: Propagation Delay $= \frac{d}{s} = \frac{\text{Length of Network}}{\text{Speed}}$

average rate of bit arrival $= La$ bits/sec $=$ # bits * Average rate of Packet arrival

traffic intensity $= La/R =$ ARBA / trans delay for L bits of data

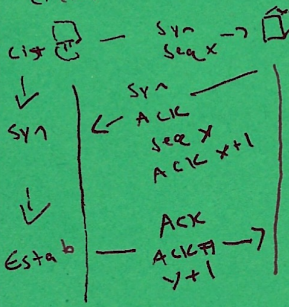


Children - Apps
Parents - Trans
UPS - Network

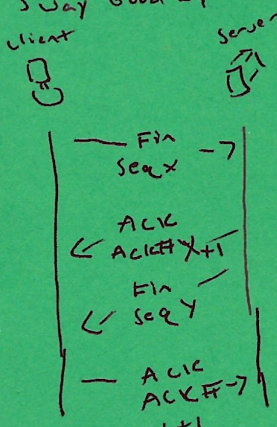
Net - Host to Host
trasp - App to Appor Proc to Proc

Tcp/Udp Seg

3 way HandShake



3 way Good Bye



RDT 1.0: Perfect Conn
x Bit Loss
x Errors

RDT 2.0: Chanel w Bit Err
✓ Check sum bit enough
✓ Retransmissions
✓ ACK & NAK

RDT 2.1: Chanel w Loss
✓ Seq #
✓ Ignore dup ACKs
✓ out of order packets retried

RDT 3.0: Chanell w errors & loss
✓ Timed Retransmission
✓ pipeline transmission

AvgTCPTP = 3/4 w/RTT (window size)

go-Back-N - Cumm Acks. 1 timer for all, retransmit from oldest on Acked

Selective Ret - Indv timers retransmit as needed

MSS - Maximum Segment Size

RDT 2.2: NAK Free
✓ ACK on recieved packet sin order
✓ Cumm ACKs

Estimated RTT = (1 - α) * Estimated RTT + α * Sample RTT

typical α = .125 or 1/8

Timout Int = Est RTT + 4 * Dev RTT

Deviation RTT

Flow Control - Control over data being sent the reciever as do not overflow the Rec buffers.

Tahoe - 1/2 on 3x Dup Ack
Reno - 1 mss on 3x Dup Ack