

CS168 cheat sheet

IP prefix = 8.8.8.8

TCP congestion control

- slow start should avoid network, make efficient of avail. network capacity
- have bidirectional slow start
- congestion changes (congestion AIMD), optimizations (fast recovery)
- slow start why: determine avail. bandwidth from add/drop how: exp increase per RTT (AIMD) (end = cwnd + 1) for fairness
- congestion why: kept to slow in avail. bandwidth how: AIMD (ACK end = cwnd + 1/cwnd) for fairness
- slow recovery: keeps packets "in flight" after loss how: diff. will not (cwnd) on every dup ACK

$TCP\ throughput = \frac{1}{\sqrt{2}} \frac{1}{RTT} \sqrt{\frac{cwnd}{ssthresh}}$ max-bw fairness / fair queuing

- route assisted cong. control - no better, no con = congested, e.g. explicit route allocation (ACP), explicit congestion notification (ECN)
- application aware congestion control (PWS), HTTP flows - packet addresses (header), sequence numbers (human) - PWS - hierarchical = namespace, admin, server
- cache, proxy, client
- tradition Ethernet - broadcast, dedicated vs shared - packet address (header) (sequence sent (current sending?))

- ① collision detection - split collision - packet address (header) (sequence sent (current sending?))
- ② collision avoidance - avoid collision - packet address (header) (sequence sent (current sending?))
- ③ collision resolution - resolve collision - packet address (header) (sequence sent (current sending?))

switched ethernet - spanning tree, self-healing, no H/W, caching

how build spanning tree - for loop-free forwarding (physical layer), shortest path tree not attached of local IP

- ② self-healing switches optimization to detect/solve

Network layer: web server domain network: IP addresses

Link: MAC addresses

Address resolution protocol

① ARP (UDP: 67) from 0, dest P. → ethernet (initial) as source

② RNS application (UDP: 53) from IP, dest q. → will w/ MAC of gateway

③ HTTP (TCP: 80) remote layer, dest site initi client MAC getting

wireless - broadcast - hidden channel (fail to prevent collision) exposed channel (need less by himself)

collision avoidance: avoid collision, explicit req/resp (RTS/CTS) / handshake RTS: request to send CTS: clear to send

detectors - random walk, high bandwidth, low delay, practically deterministic

scheduling, packet scheduling

solutions: ① ② ③

SPN: data plane: switches - forwarding distribution

Control plane: servers - network wide

