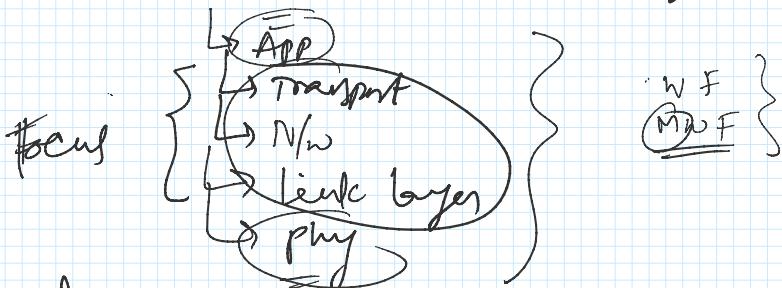


Introduction

04 August 2021 17:06

1. Introduction to networking terminologies

↳ Motivate the need for different layers



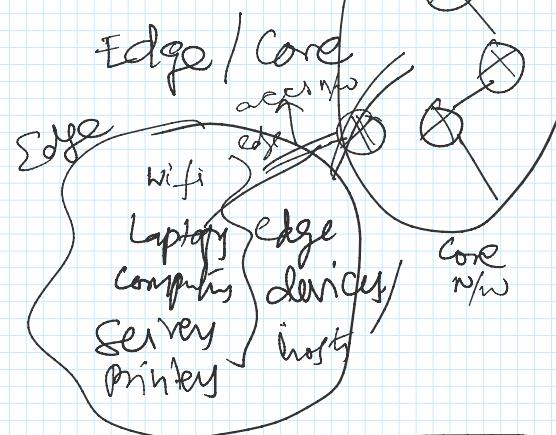
2 Monday 5-6 pm? ✓

See USA

Internet

- ↳ Modem
- Router
- ISP
- DNS
- IP addressing
- Switches

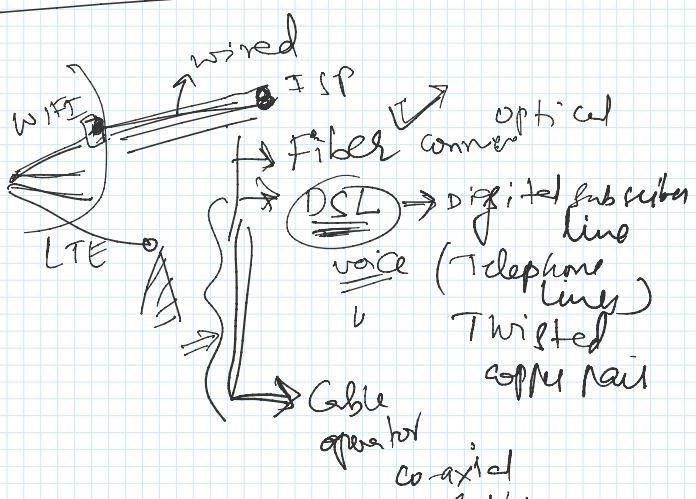
Access
N/W



Access N/W's

Internet at home

Edge devices
Access N/W
Core routers N/W



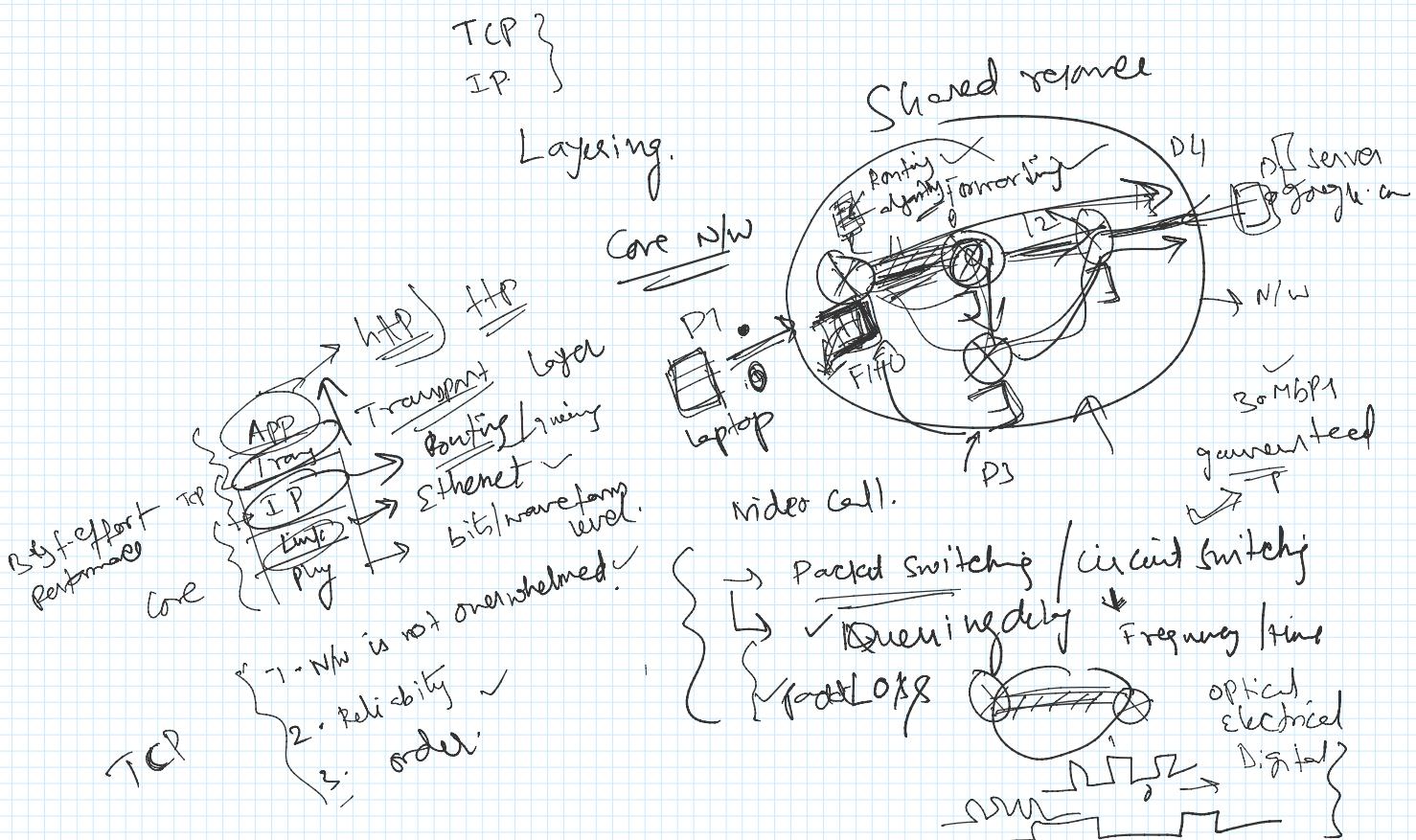
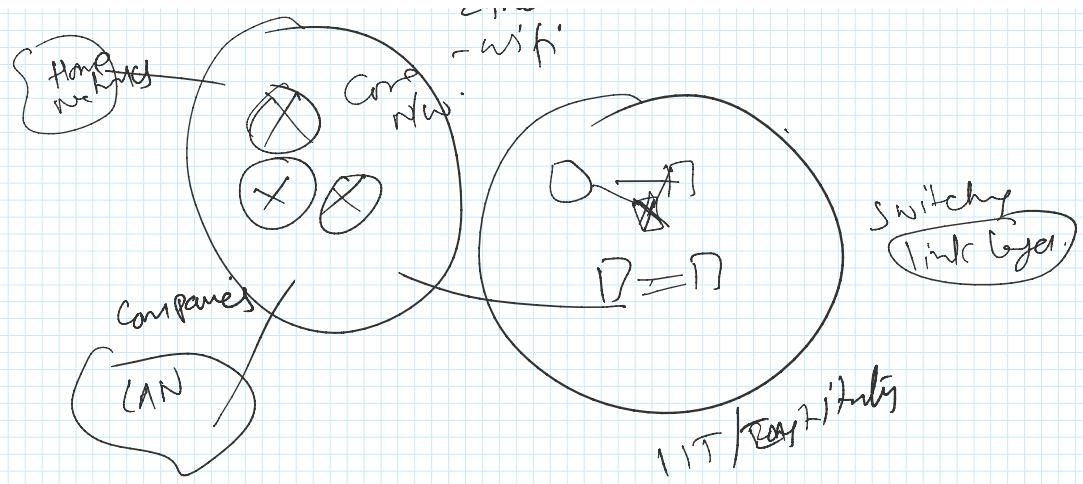
IT N/W

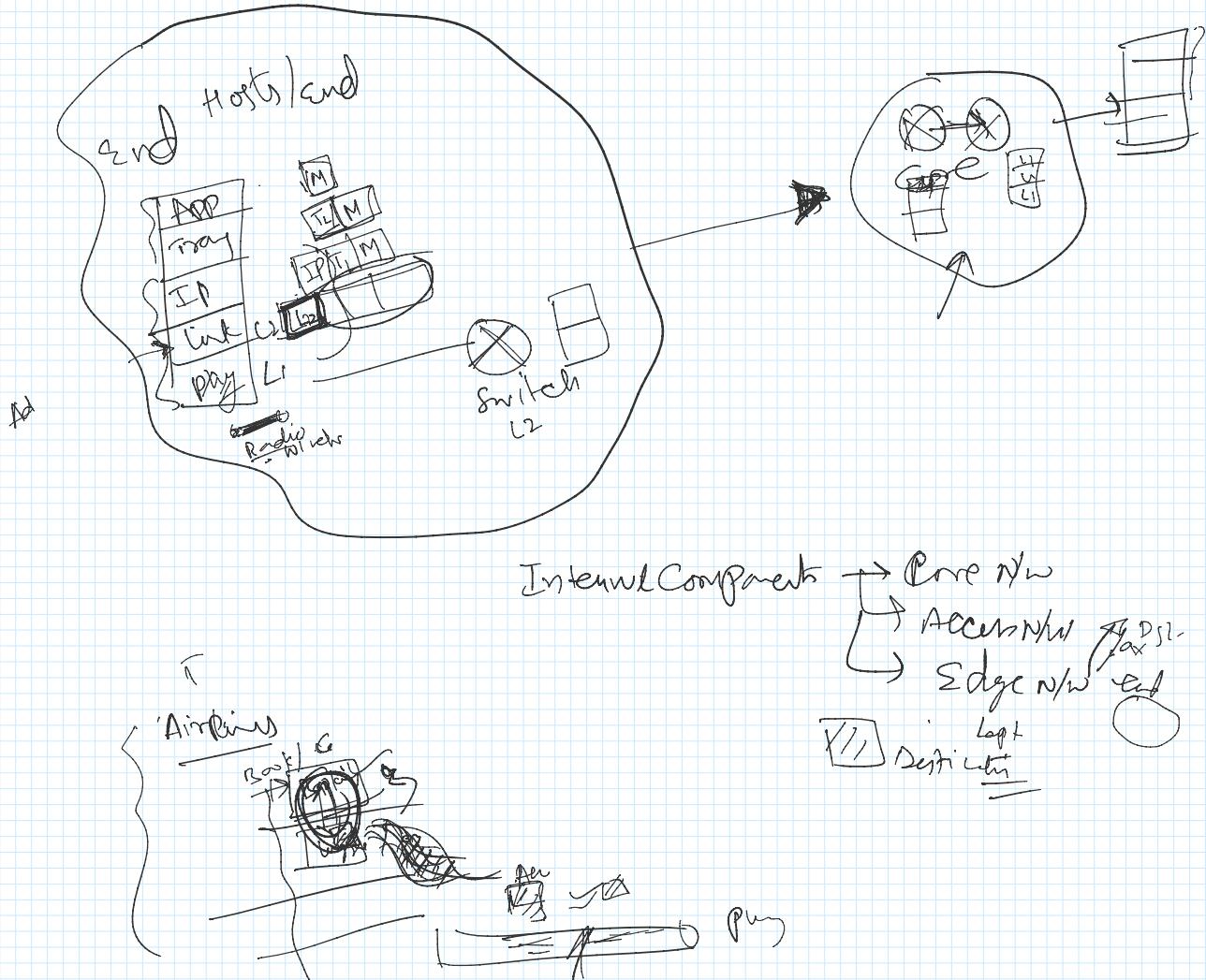
LAN

- Ethernet
- wifi

□ ← □

Home net → Core

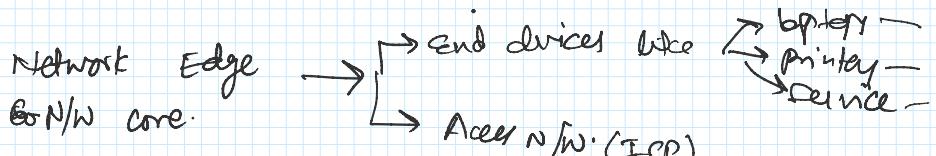


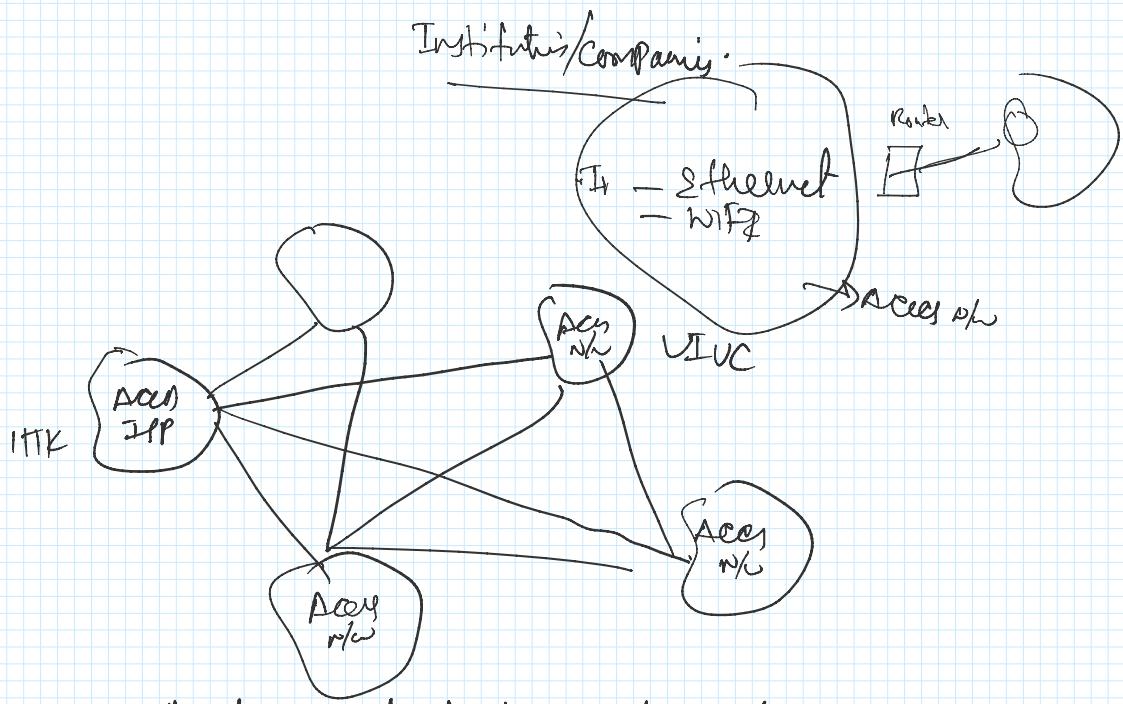
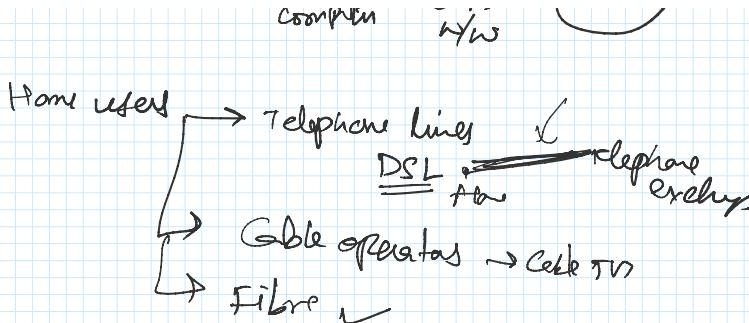


6/8/21

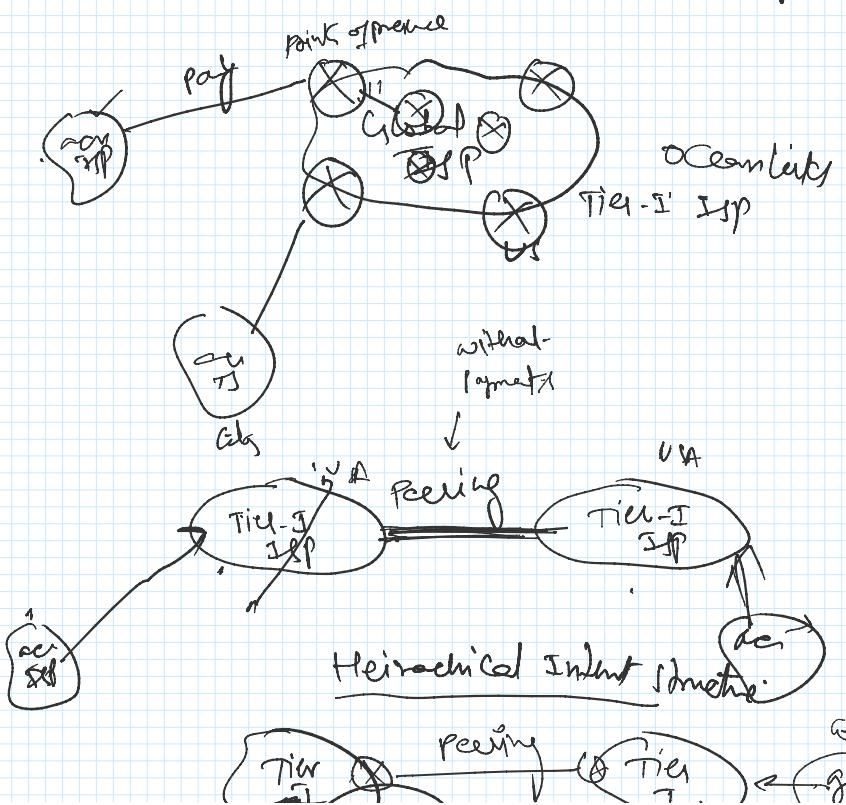
- Recap
- Architecture of Internet
- Packet switching
 - Delay, Throughput, Packet Loss.
- Queuing delay
 - Delay varies w.r.t. of link capacity
 - Arrival rate / data rate
 - Small simulations

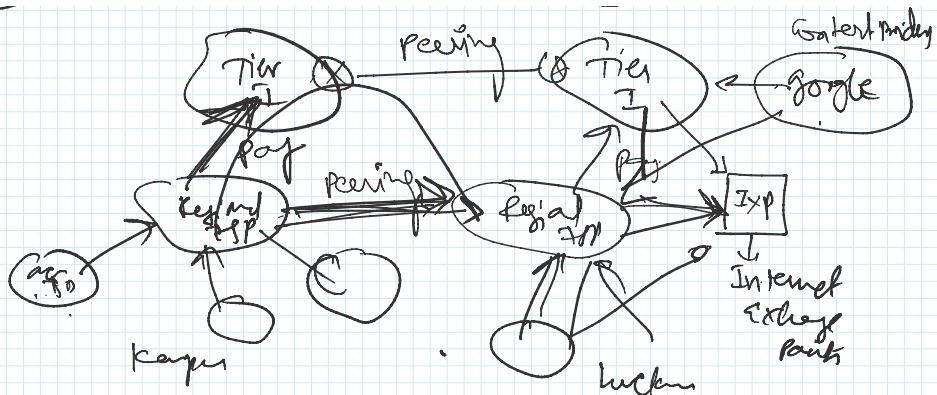
Recap:



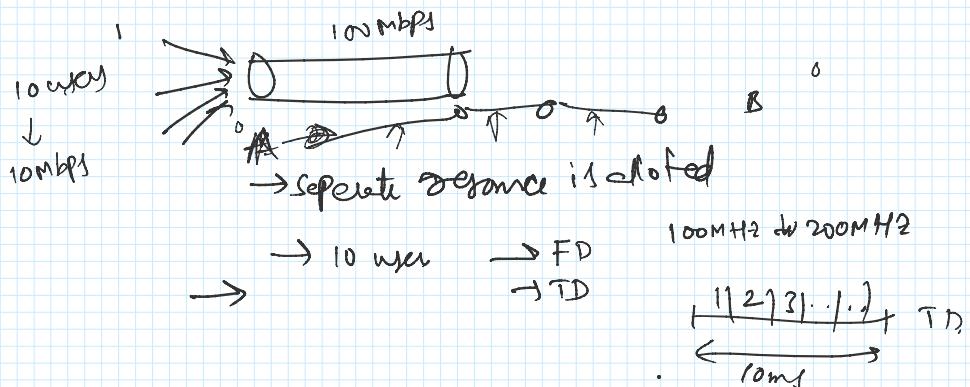


- Practically infeasible to connect each other directly.





Circuit Switching / Packet Switching

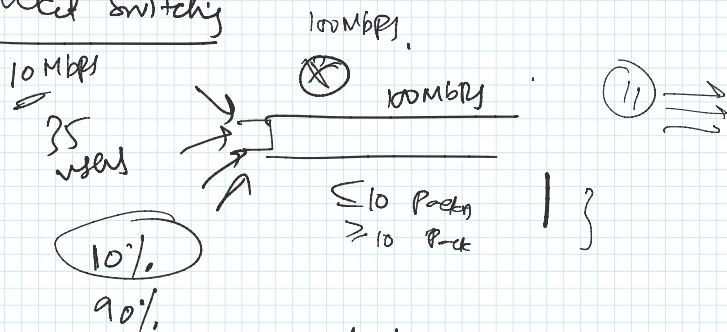


→ overhead. ✓

→ Under utilization

$$\frac{1}{100} \quad \frac{99}{100}$$

Packet Switching



< 10 users

Time instances in which

$$P(\text{no. of ways} \geq 11)$$

$$p(\text{archive}) = 0.1$$

$$x_1 \rightarrow \pm 1/0 \quad p=0.1$$

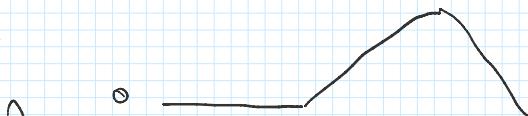
$$x_1 x_2 \dots x_{25}$$

$X_1 + X_2 + \dots + X_{35}$
Binomial distribution

$$\geq 11 \text{ days}$$

< 10 yrs

$$= (10 \text{ Mbps})$$



$X_1 + X_2 + \dots + X_n$
Binomial distribution

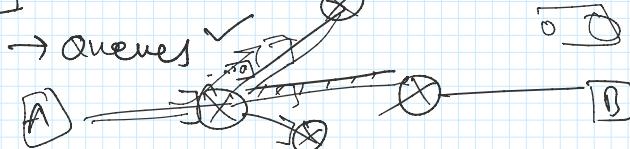
$$P(\text{no. of heads} \geq 11)$$

CDF

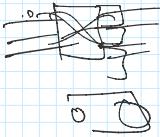
ECDF

$$\underline{\text{QoS}} =$$

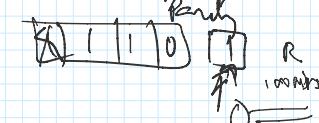
Packet switching



→ Queues
→ Processing delay
→ To form an which of link
→ Error checking

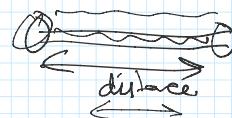


→ Queue delay



length

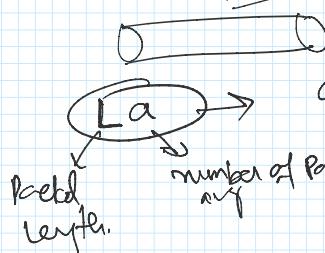
Transmission rate



$$\begin{cases} 2 \times 10^8 \\ 1 \times 10^8 \end{cases}$$

Queue delay

10ms

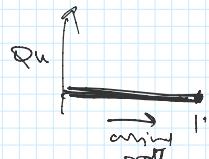


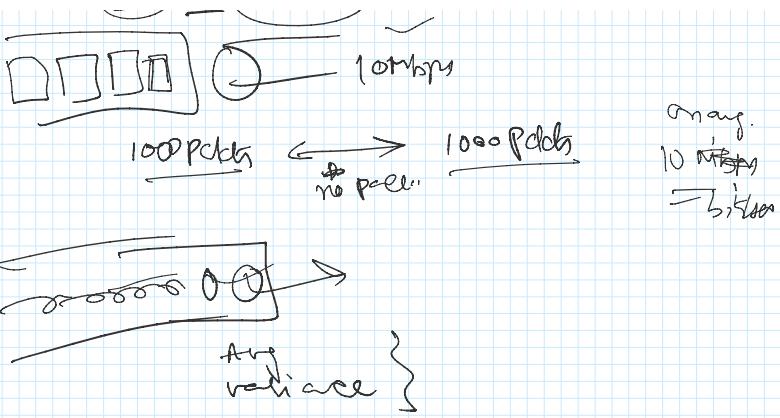
average input rate

number of packets arrive/sec

Packet length

$$La \leq 10 \text{ Mbps}$$





arrival rate < ~~avg. inter~~
avg. arrival rate

