○ Access Control

MAC

```
                    MAC
         /           |          \
  Random Access   Control    Channelization
   /    |    \     Access      protocols
                  /       \      /      \
Aloha  CSMA  CSMA/CD   Polling  Token  FDMA   TDMA
             CSMA/CA            passing
```

Random Access → Aloha, CSMA, CSMA/CD CSMA/CA

Control Access → Polling, Token passing

Channelization protocols → FDMA TDMA
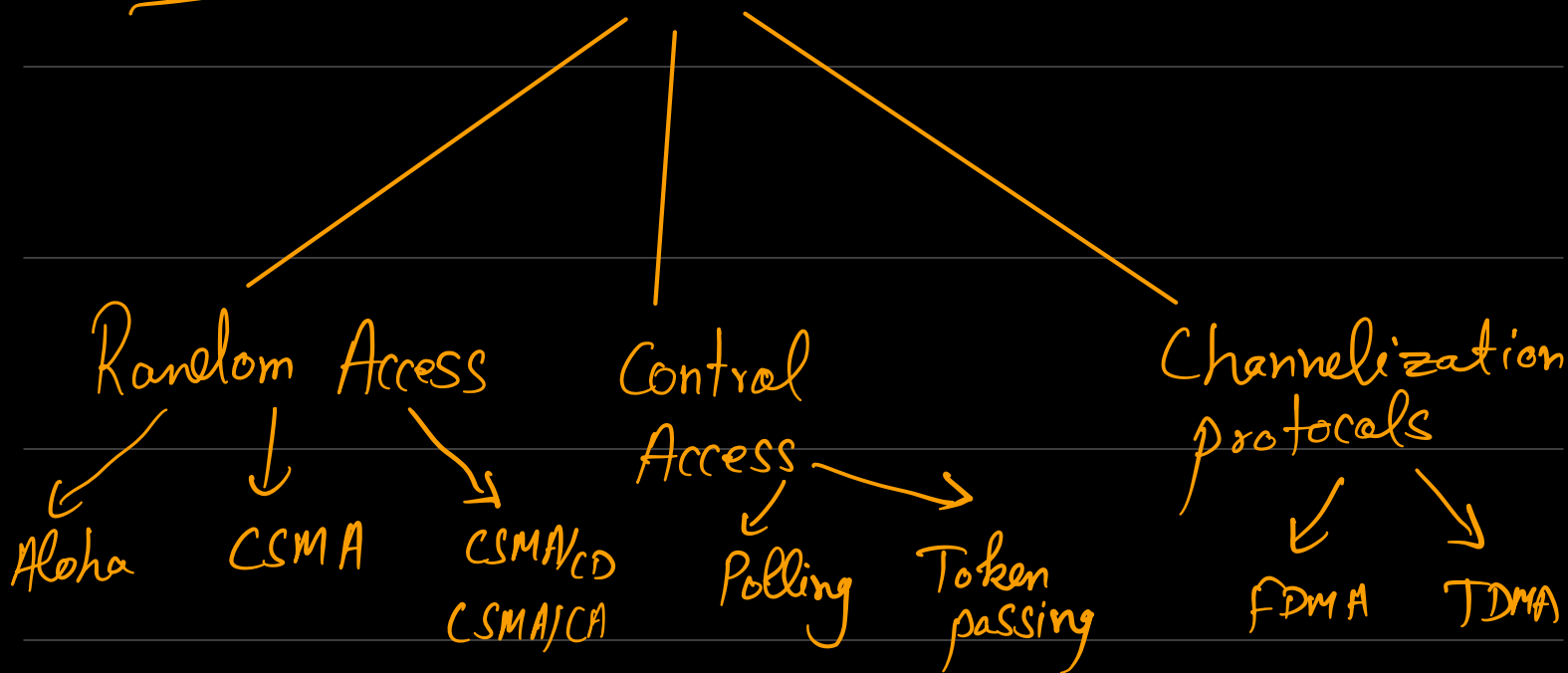
- PURE ALOHA → • It is a Random access protocol which means it will tramsit without checking the channel.

    • Ack is there → Retransmit when there is collision

    • LAN based

    • Only Tx. time

    No propagation time.

    → Vulnerable time ⇒ $V_T = 2T_t$

$\rightarrow$ **Efficiency** $\Rightarrow$ $\eta = G \times e^{-2G}$
$$\downarrow$$
no. of stations
who want to
transmit the data.

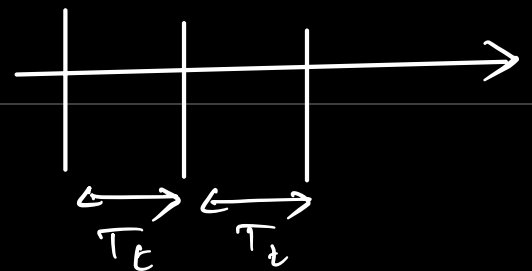- **Slotted Aloha** $\rightarrow$

'Pure Aloha'	'Slotted Aloha'
• Any time Tx.	
• $V_T = 2 \times T_t$	
• $\eta = G \times e^{-2G}$	• Any Tx. will start at the beginning of the slot.
$\rightarrow$ 18.4 %	• Collision is possible if multiple stations transmit at the start of slot
	• $V_T = T_t$
	• $\eta = G \times e^{-G}$

- **CSMA (Carrier Sense Multiple Access)**

1- persistant

0-persistant

p-persistant

↓
continuously sense
the channel
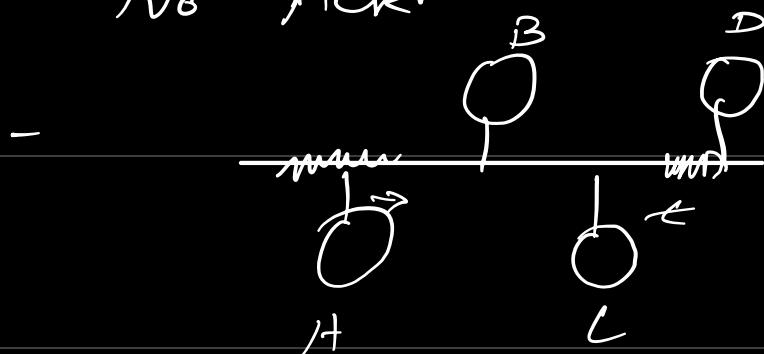
check after
random
time

↓

↓

○   ○

○   ○

A
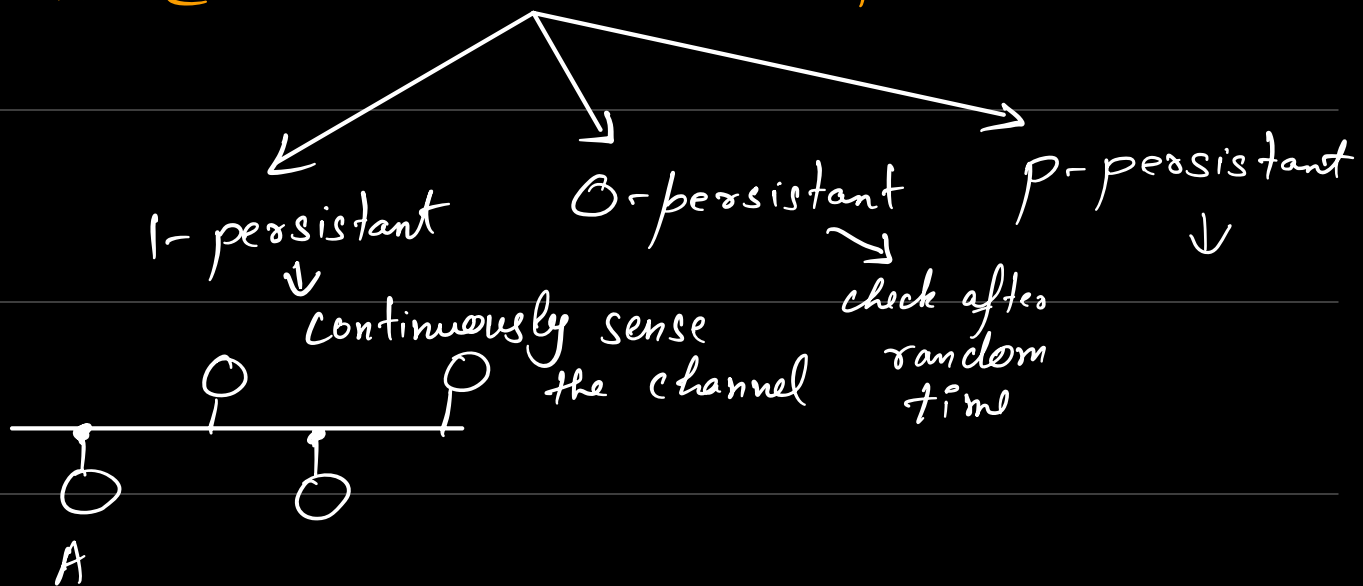
⟶ If channel is busy then wait.

↓

only check at your point
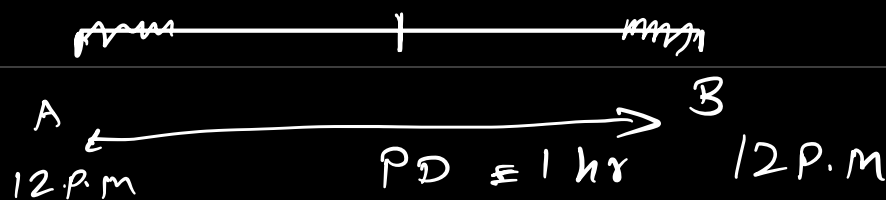of connection not the whole
Channel.

- Collision will be there when multiple
devices find the channel free at the
Same time.

-

- <u>CSMA/CD (Collsion detection)</u>

- No Ack.

If during Tx. you get the collision
Signal then you get to know that
your Signal has collided.

A
12 P·m
PD ≅ 1 hr
B
12 P·m

$$\boxed{TT \geq 2 * PD}$$

$$\eta = \frac{1}{1 + 6.44a} \qquad a = \frac{PD}{TT}$$

- CSMA/CA (collision Avoidance)

Not in Syllabus.

Q. B.w = 100 Mbps   L = 1250 bytes

d = 1 Km

find Signal
speed   in a
CSMA / CD network

$TT \geqslant 2 * PD$

$$\frac{1250 \times 8}{100 \times 10^6} \geqslant 2 \times \frac{d}{V}$$