

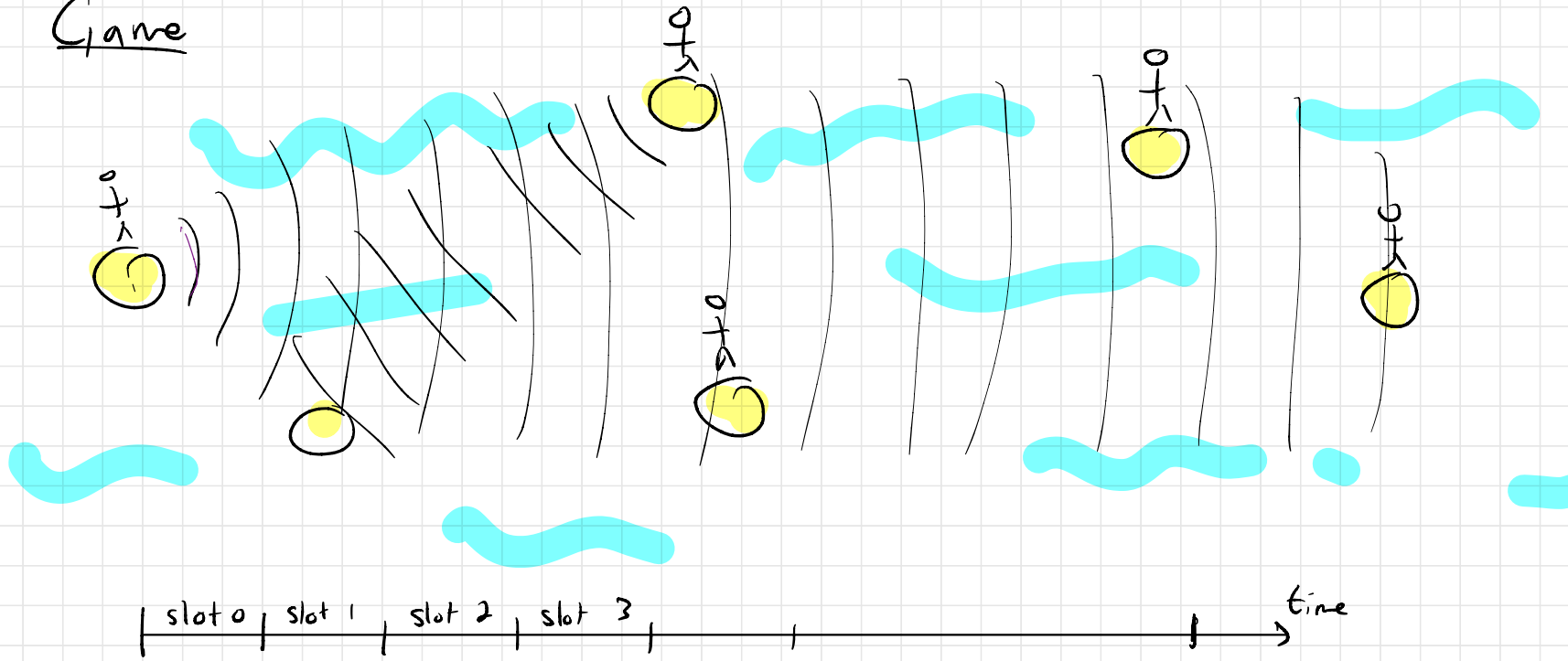

Plan

- Warm up: "Game"
- Ethernet & networking
- Key concepts
 - * Shared broadcast medium
 - * Exponential backoff

Logistics

- * DP prep due Friday (tomorrow) **5pm**
- * Next DP assign online Sat
- * Participation grades
- * Feedback

Game



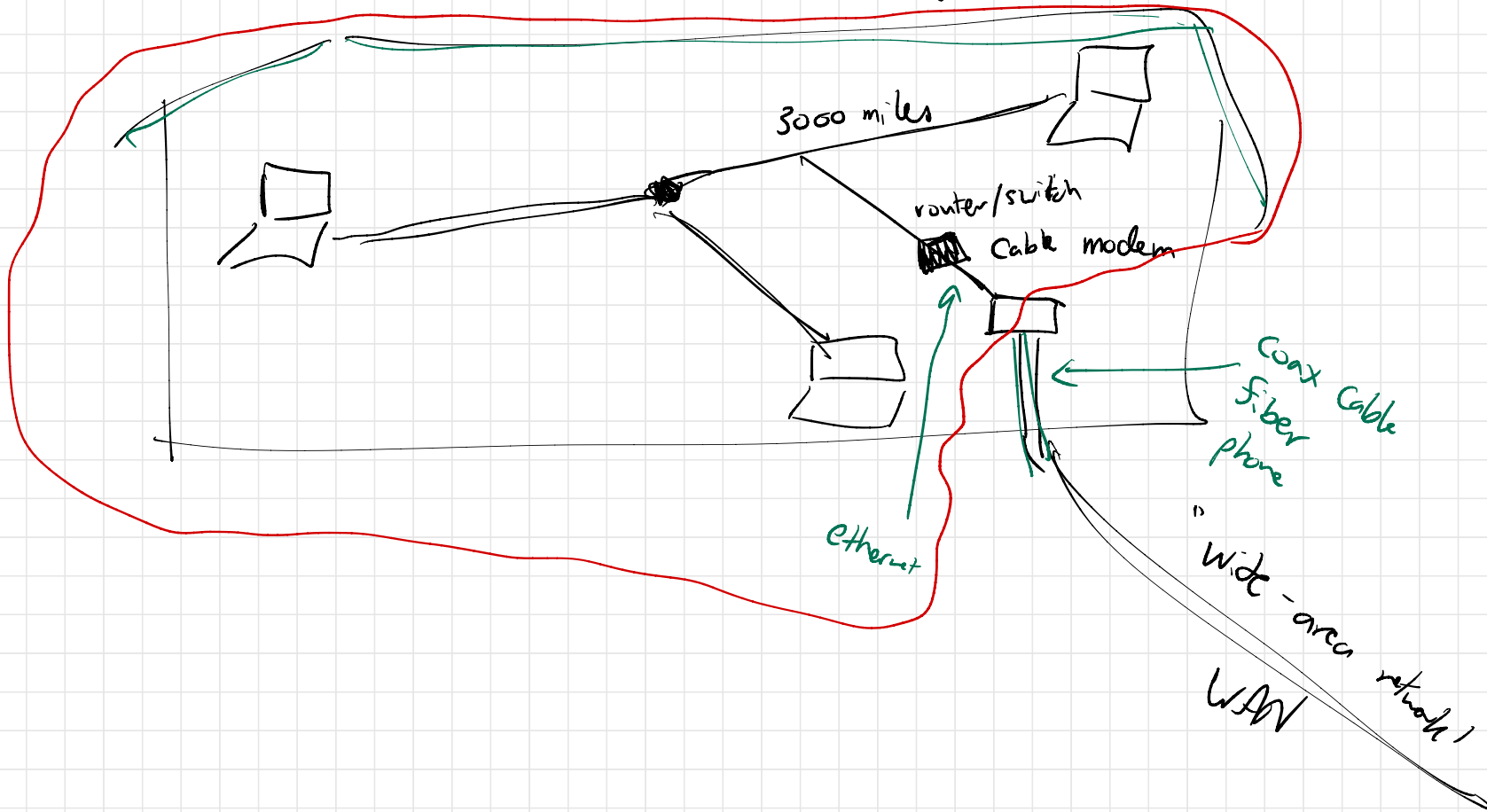
- If two of us tx at same time \rightarrow COLLISION
- Islands for agent

GOAL: Get through as many msgs as possible.

| Round | 0 | Score |
|-------|---|--------------|
| | | 2 |
| | 1 | 1 |
| | 2 | 1 |
| <hr/> | | 3 |
| | | 4 |

(10 = best possible)

Network "Local-area networks" LAN



Technical Ideas

- distributed control — "dumb network" smart endpoints
- no guarantees of delivery
- filtering packets at HW layer

+ updating network behavior

+ fault tolerance

+ let software handle it

+ ignore junk/failed stuff

+ saves work (broadcast)

"Exponential Backoff"

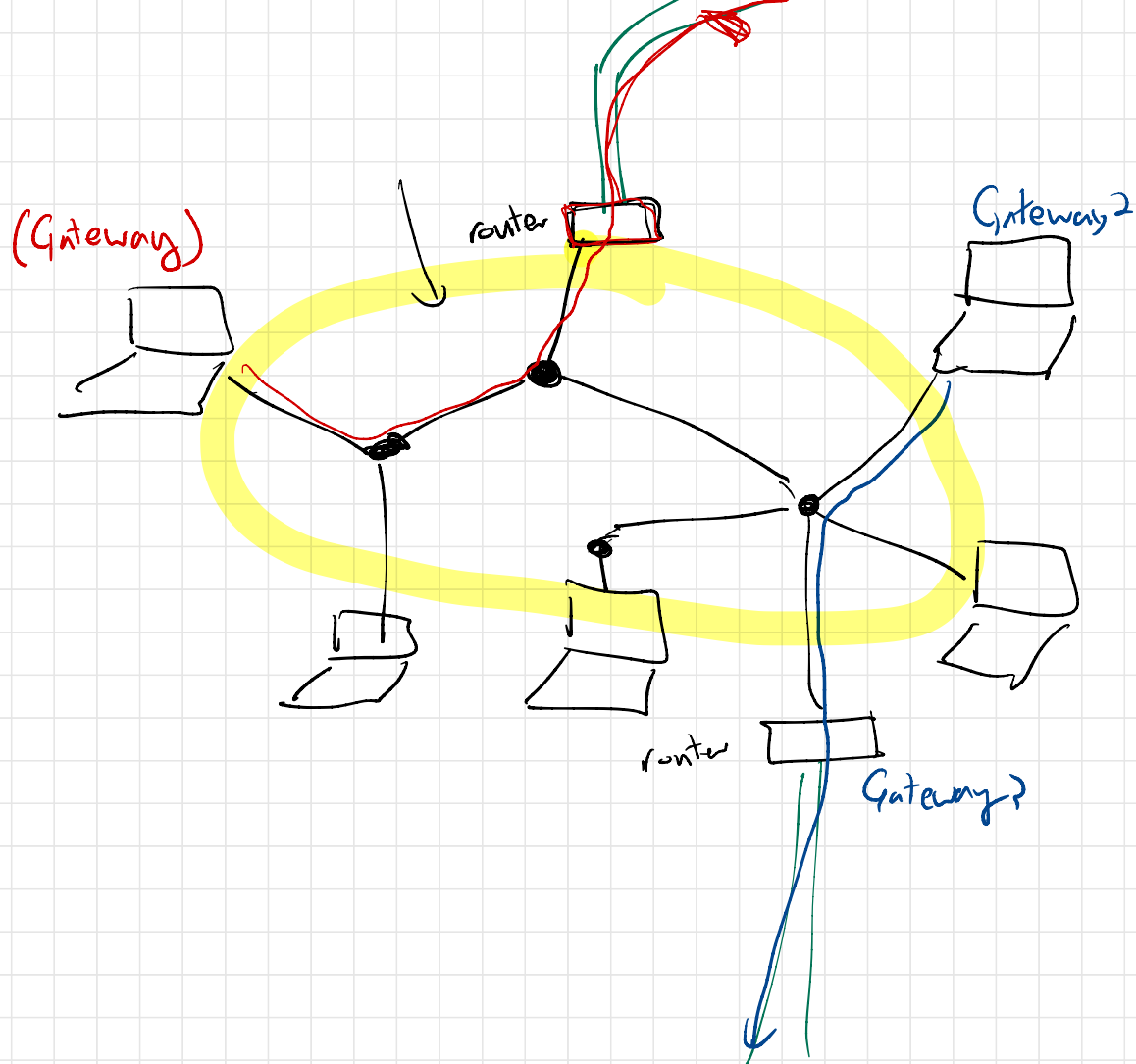
Ethernet uses

CSMA/CD technology

multiple access

carrier sense = listening for silence

Collision detection



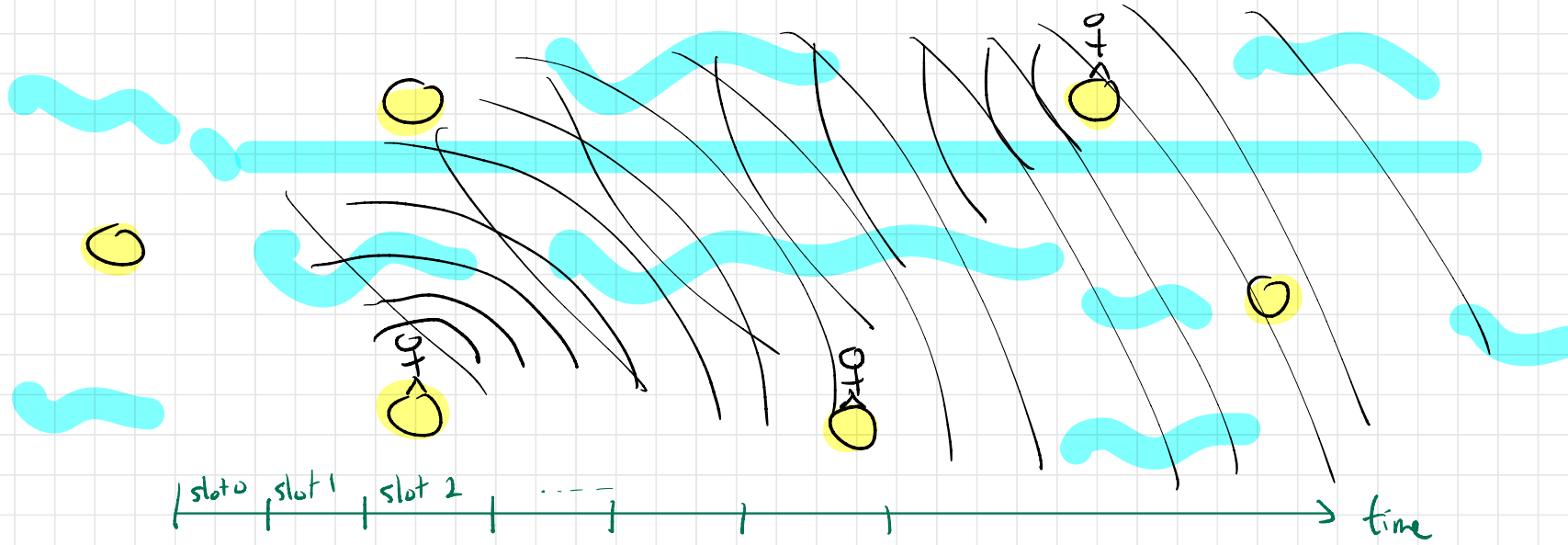
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Game: Multiple access to a shared network



IS two+ people tx in the same slot \Rightarrow COLLISION

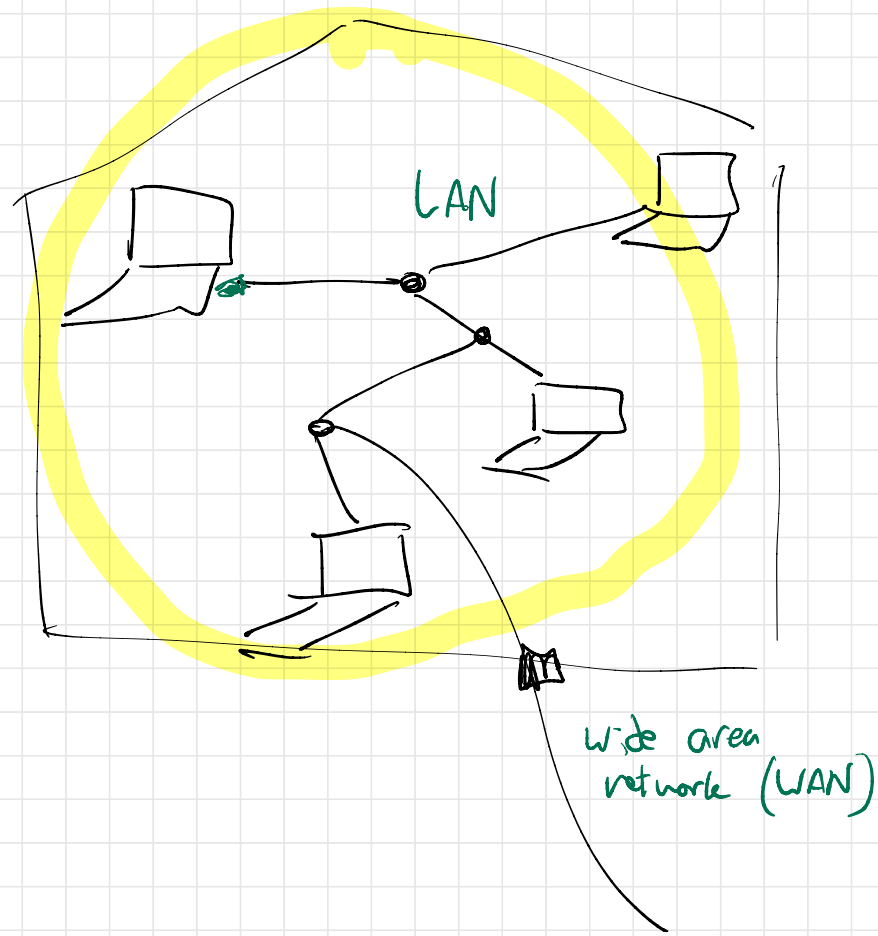
CAL/SORE: # of uncorrupted msg/packets that get through.

| Round | Score |
|-------|-------|
| 0 | 0 |
| 1 | 3 |
| 2 | 2 |

Computer Networks

- $\approx 10s - 100s$ of machines
- "Local area network" (LAN)

Idea: Local broadcast
↳ shared medium
↳ one person tx
all rx
"dumb network"



Technical Components

- * dumb network / broadcast
- * each machine independent interfaces
- * hardware filtering of packets
- * "carrier sense" - detect when other person tx
- * Repeaters

+ Simple

+ logic is in endpoints

+ cheap

+ distributed control

↳ perform

↳ fault tolerance

↳ flexibility

SDN

CSMA / CD



multiple access

Carrier sense — deference

collision detection — listening as you're tx,
retransmit if collision

Exponential Backoff

- Nodes in Ethernet tx

- If collision

x ret_x later

x wait random amt of time
twice your last waiting time

→ Halve wait time decrease by 1

AIMD