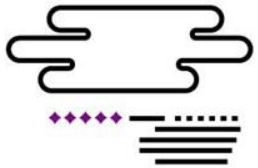


Introduction to Local Area Networks

A multilayer architecture

Emmanuel Chaput

Objectives

- Goals

of a multilayer architecture

Why ?

- Role

of each layer

How ?

Local area network objectives

Organize communications

Share medium access

Transmit data on a medium

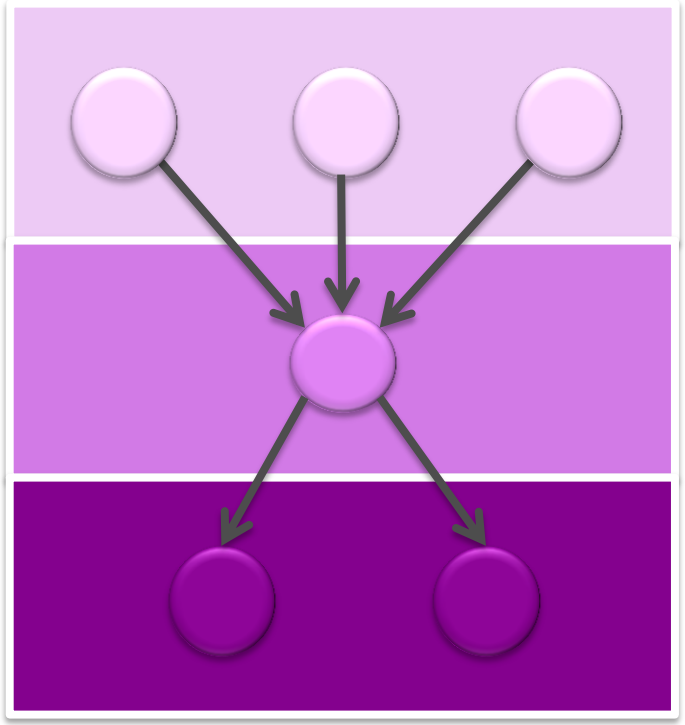
→ Need to split functions among entities grouped in layers

Protocol entities and layers

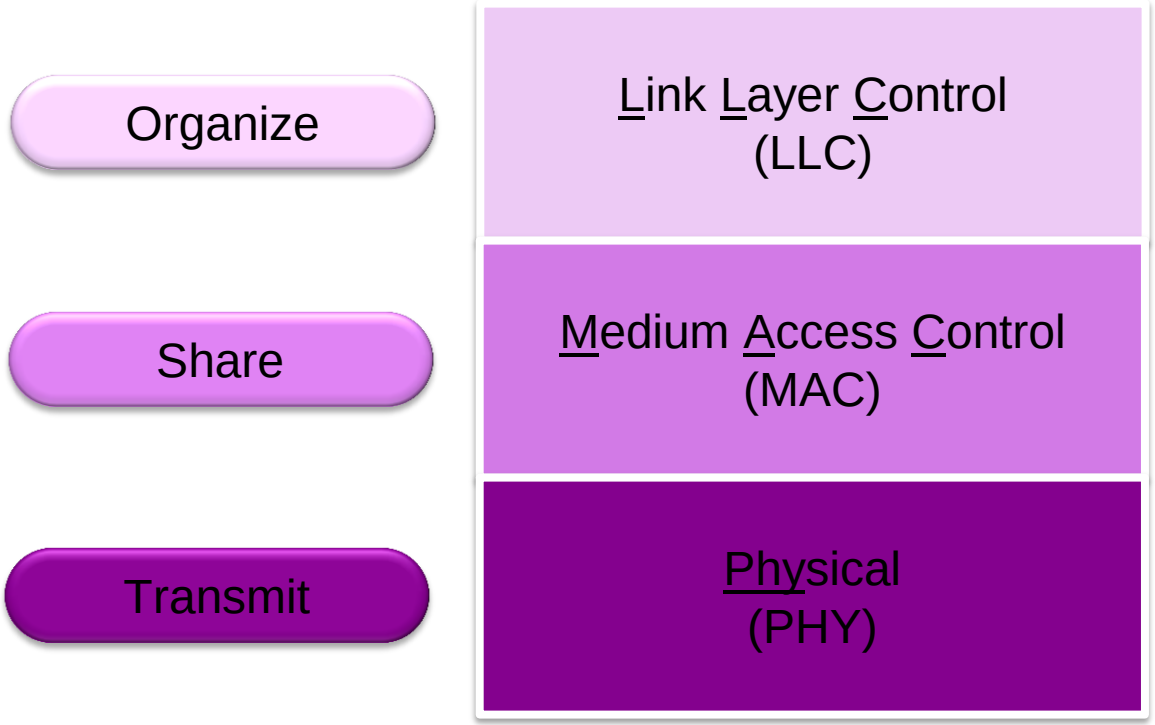
Organize

Share

Transmit



Protocol entities and layers



Physical layer
& data transmission

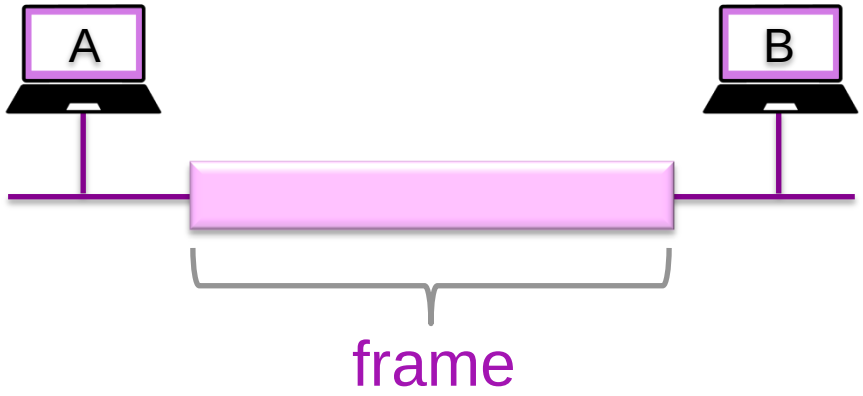
- What kind of medium ?
- Which modulation ?
- Power, throughput, distance ?

Transmit

Physical
(PHY)

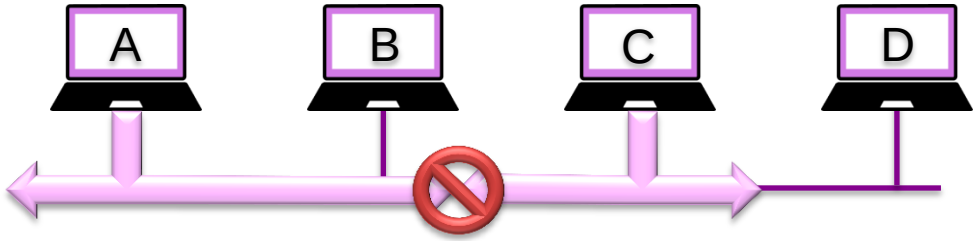
Link layer framing

- *A* can send bits to *B*



- Frame length upper bounded

Collision



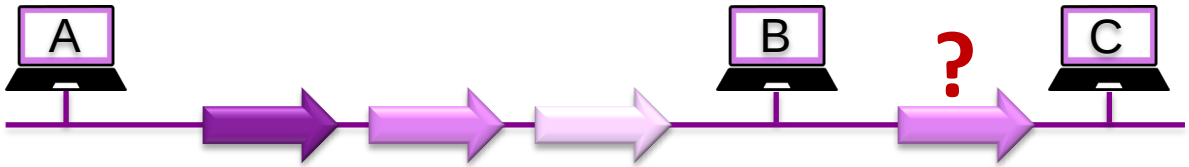
- *A* starts transmitting a frame
- *C* starts transmitting
- Frames collide

How could we solve the medium access issue?

- Let it go
  - Simple, inefficient
- Implement a civil behaviour
  - Algorithmic solutions
- Organize the media sharing
  - Protocol based solutions

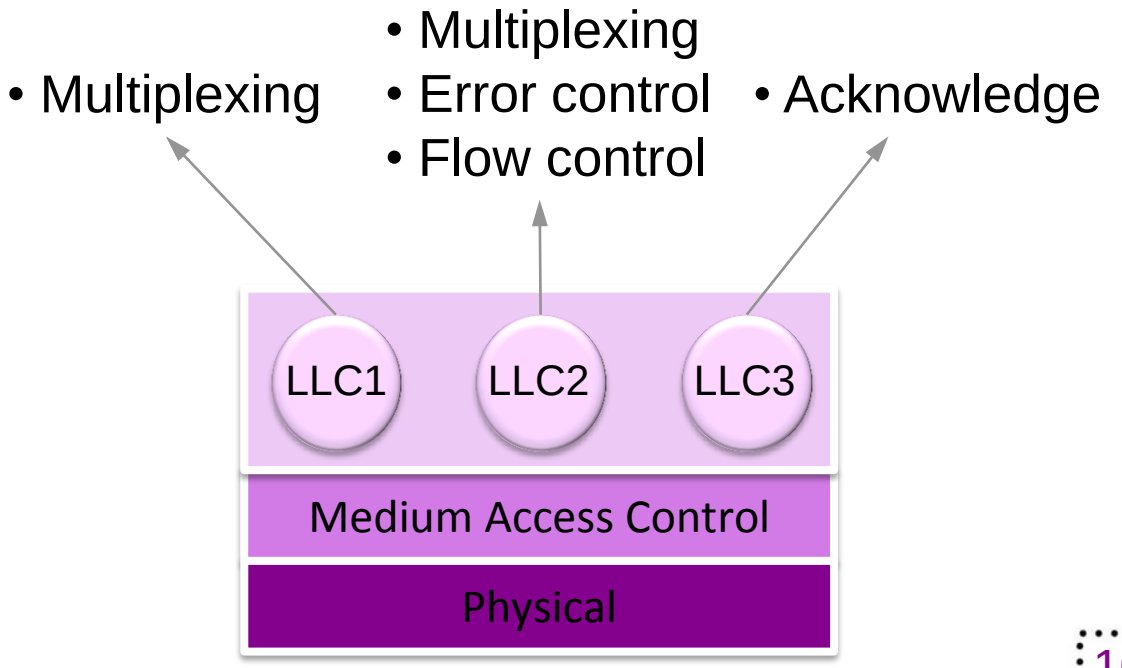
Link layer
& communication organization

- *A* sends frames to *B*



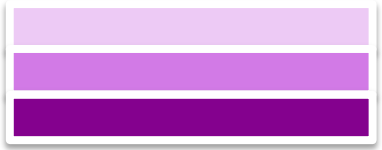
- *B* receives them all?
  → Error control
- Not too fast ?
  → Flow control
- To *B* but not to *C* ?
  → Adress
- Several communications with *B* ?
  → Multiplexing

IEEE 802.2


• Multiplexing
• Multiplexing
• Error control
• Flow control
• Acknowledge
LLC1
LLC2
LLC3
Medium Access Control
Physical

Summary

- LANs are complex
  - Lots of different functions
- Multilayer architecture



- Objectives for each layer