

802.3 Frame Format

Preamble

10101010

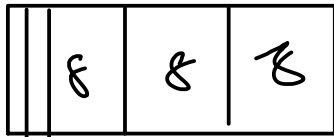
SFD

10101011

← indicates last byte of preamble

Exercise 1: How many possible OUI's are there? How many devices can be manufactured for each OUI?

OUI

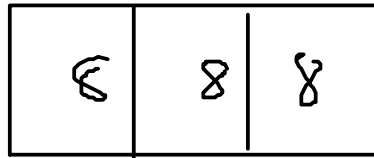


broadcast & multicast bits

24 bits for OUI

$$2^{22} \approx 4 \text{ million}$$

Manufacturers can be assigned a unique OUI



$$2^{24} = 16 \text{ million devices}$$

total of 2^{48} possible MAC addresses.

per OUI (manufacturer)

$$2^{10} = 1000$$

$$2^{20} \approx 1M$$

$$2^{30} = 1B$$

$$2^{40} = 1T$$

$$2^{48} \approx 64 \text{ Trillion}$$



BUS



MAC is CSMA/CD

↑
carrier sense

↓
collision detected

Medium Access Control

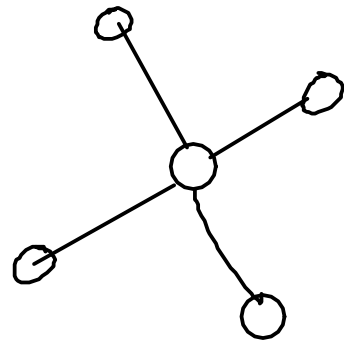
"MAC"

→ DLL
layer 2



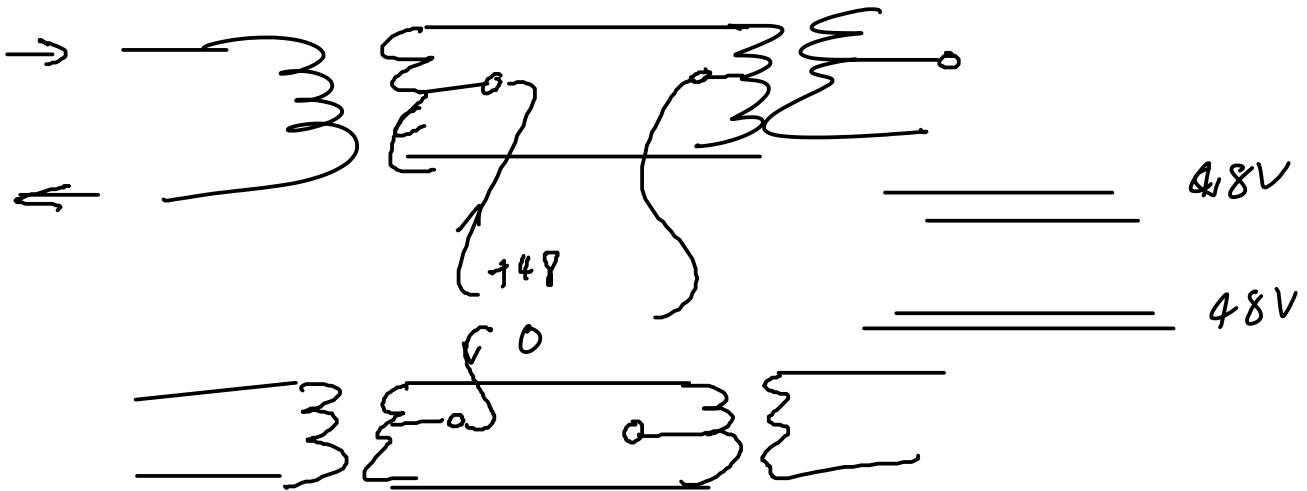
— address
— CRCs

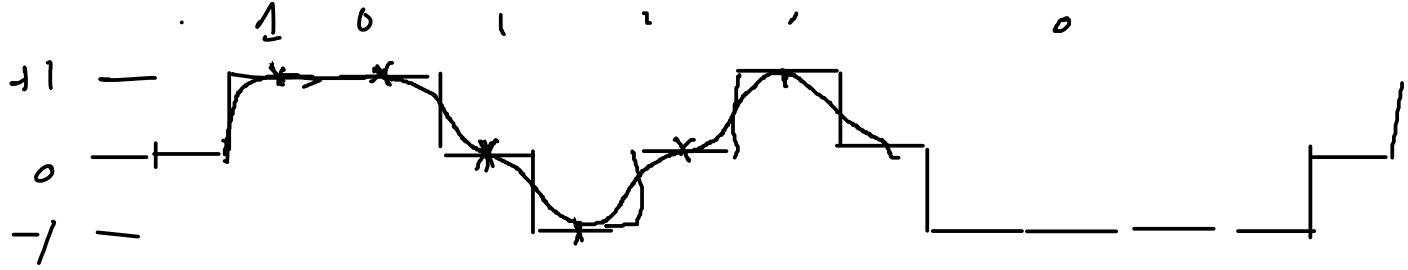
— media access



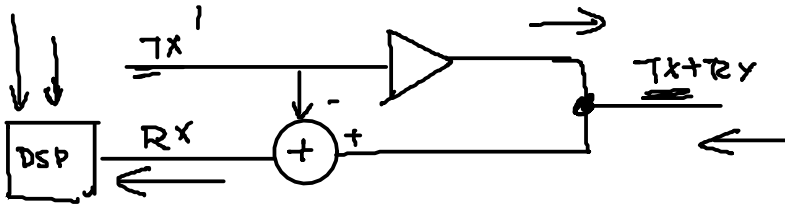
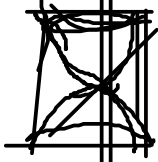
STAR

PoE



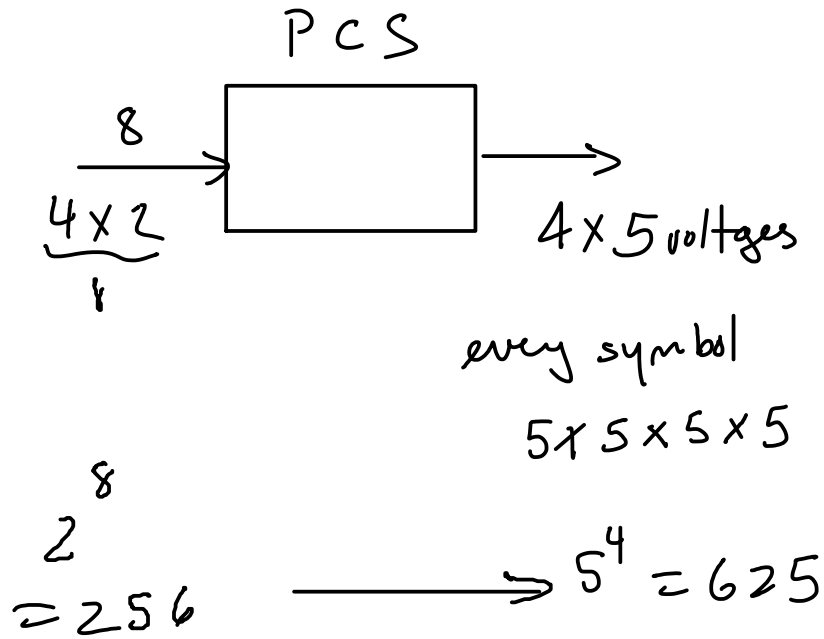


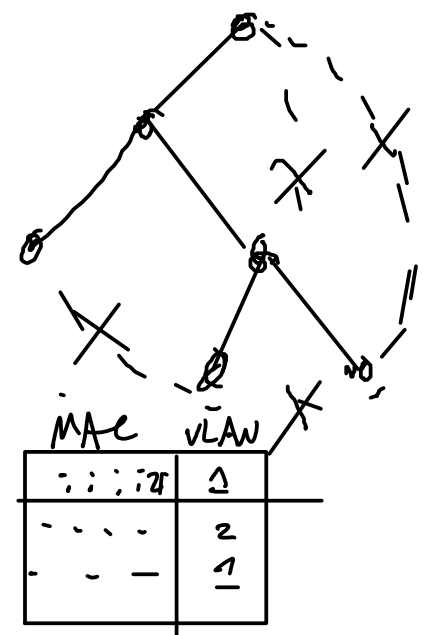
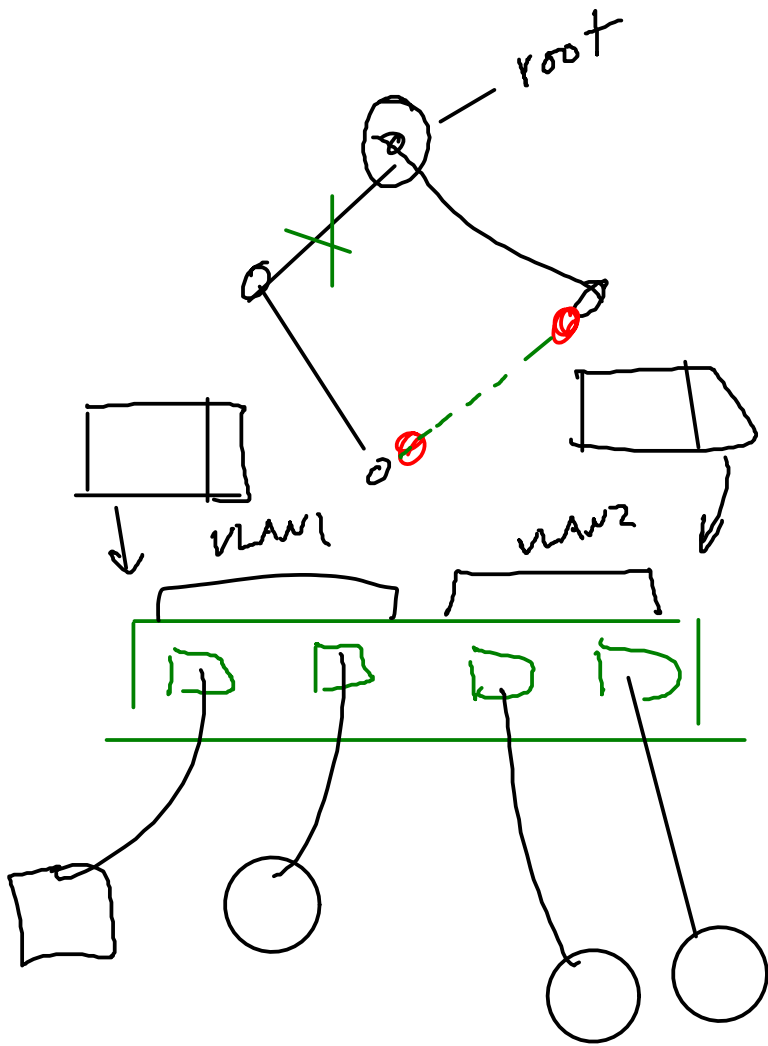
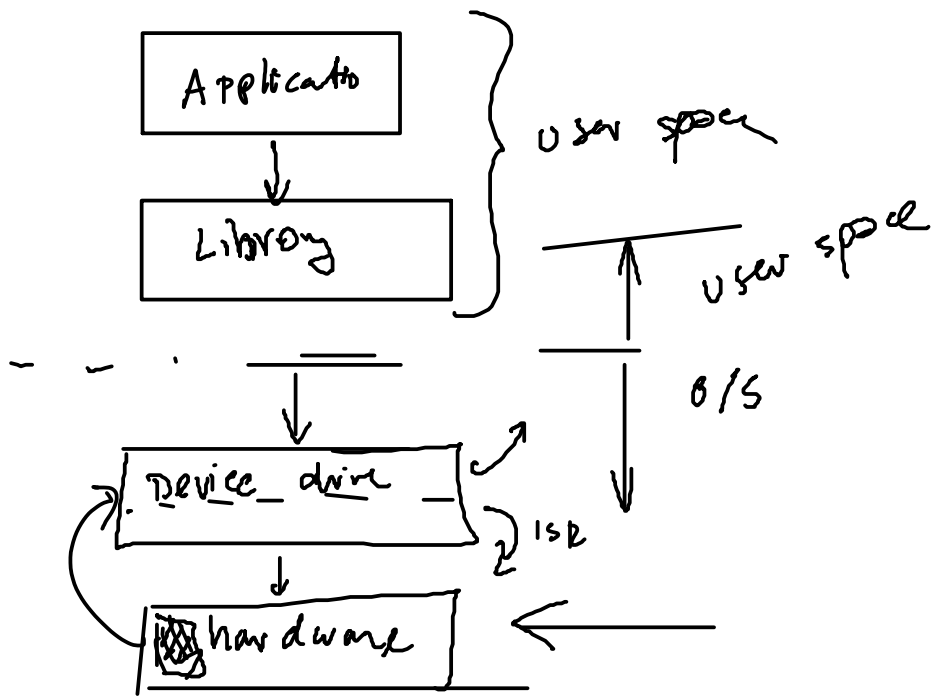
100 μ b/s PHY 4B5B + MLT-3



Lecho & crosstalk canceller.

PAM +1 —
 +0.5 —
 0 —
 -0.5 —
 -1 —





ADDRESS
VLAN

PORT-BASED VLAN