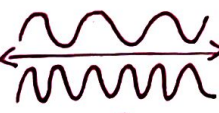
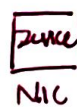
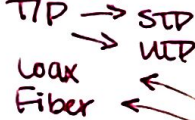


*[Signature]*

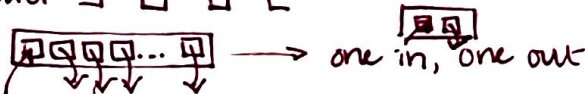
# Physical Bits 1,0 Layer 1)

## Wired

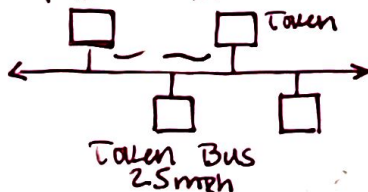


Data-Link Layer

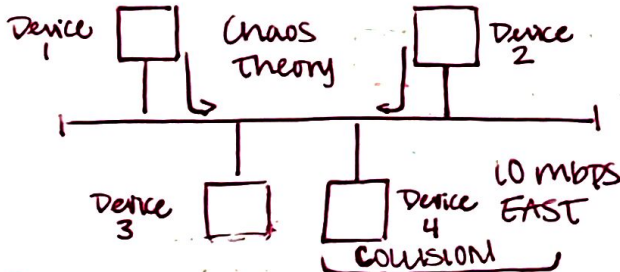
Media Converter allows you to transition from one wire to another



\* Hub is NOT smart!  
 and is only at the physical layer  
 \* Hub can talk a network up!



Backoff f(x)



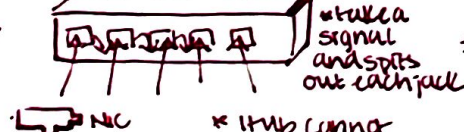
## Ethernet

Physical  
 1) T/P  
 2) Coax  
 3) Fiber

Twisted Pair  
 • baseband (TDM)  
 • broadband (FDM)

Coax wire  
 • baseband (TDM)  
 • broadband (FDM)

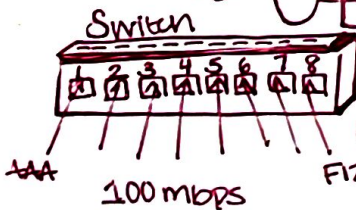
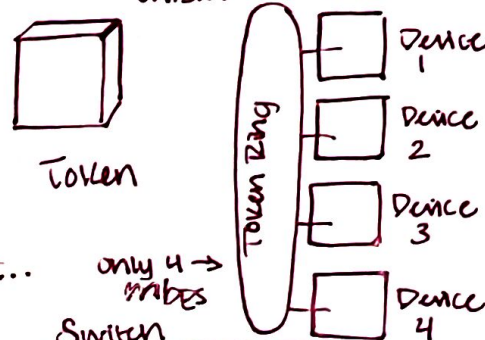
Fiber wire  
 • baseband (TDM)  
 • broadband (FDM)



\* Hub cannot talk at the same time, but w/ switch, they can talk simultaneously  
 \* In order to understand M-FI, you have to understand CSMA/CD

STANDARDS OF ETHERNET  
 1) Twisted Pair  
 2) Coax wire  
 3) Fiber wire

\* Ethernet operates at the PHYSICAL and DATA LINK  
 \* At the data-link layer, ethernet is a RULE

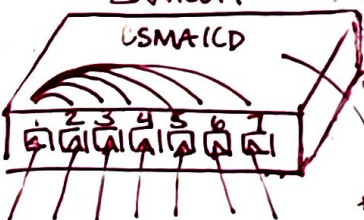


All of these have MAC addresses in common LEARN MAC

1	AAA
2	BBB
3	CCC
4	DDI
5	DEI
6	
7	FIZ

MAC Table

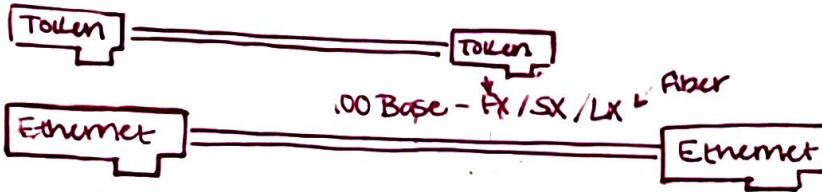
Ethernet



CSMA/CD  
 Carrier Sense Multiple Access  
 → w/ Collision Detection  
 Media access control method used in early Ethernet technology

\* you use CSMA/CD on a hub!  
 \* Switch is SMART because it LEARNS the MAC addresses!

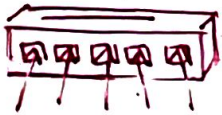
# FDI - Fiber Cable



HUB  
only detects that a device is physically connected to it

SWITCH  
can detect specific devices that are connected to it w/ MAC

Half-Duplex (BUS)



HUB IS ALSO half-duplex

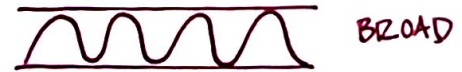
TX - twisted pair  
SX  
FX  
L2  
SE } four cable

## Ethernet Standards

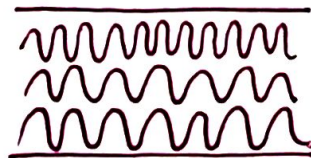
- 1). 10 Base
  - 2). 100 Base
  - 3). 10G Base
  - 4). 10G Base
  - 5). 40G Base
- Port 1      Port 2
- UP →  
Fire →  
Radio →  
Fire →
- MAX



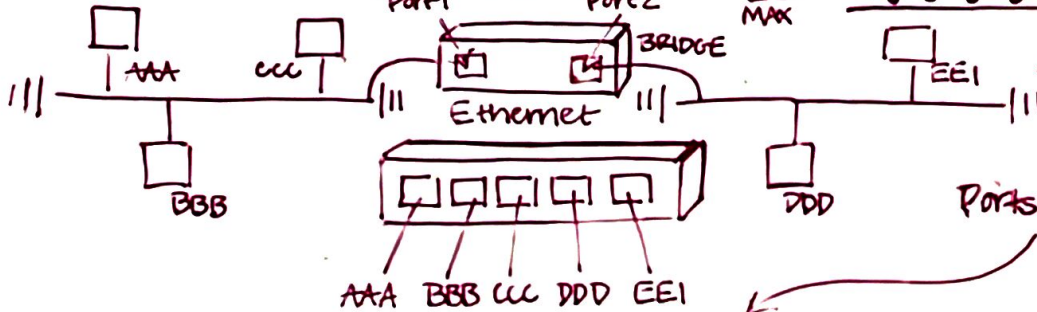
BASE



BROAD



FIBER



MAC Address

1	AAA
1	BBB
1	CCC
2	DDD
2	EEI

Ports

LEARN

Source	Destination
AAA	BBB

1. AAA
2. BBB

Source	Destination
BBB	AAA

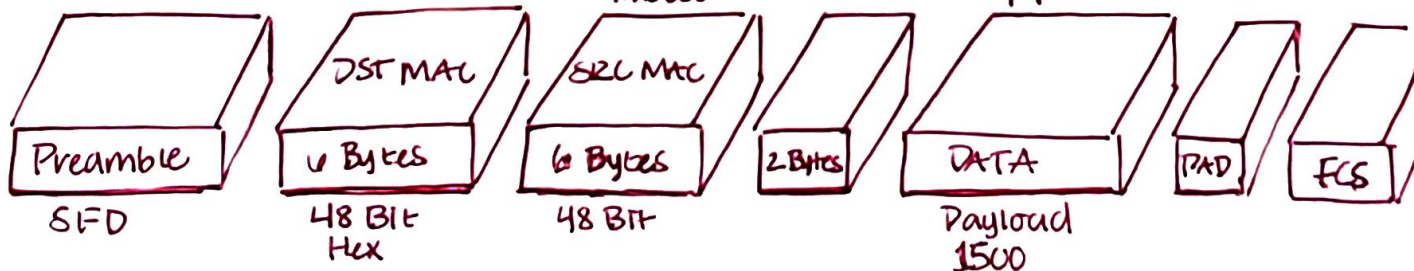
Host A  
MAC AAA

Switch

Host B  
MAC BBB

Host C  
MAC CCC

ALA: ✓  
Cam TABLE



*Handwritten signature*

|| Ethernet Bus ||



Hub "Star"  
CSMA/CD  
"Half Duplex"

Network Card

