

William Prado
04-15-2025

MAC Address: 7C-70-DB-0-SF-2F
Find the vendor

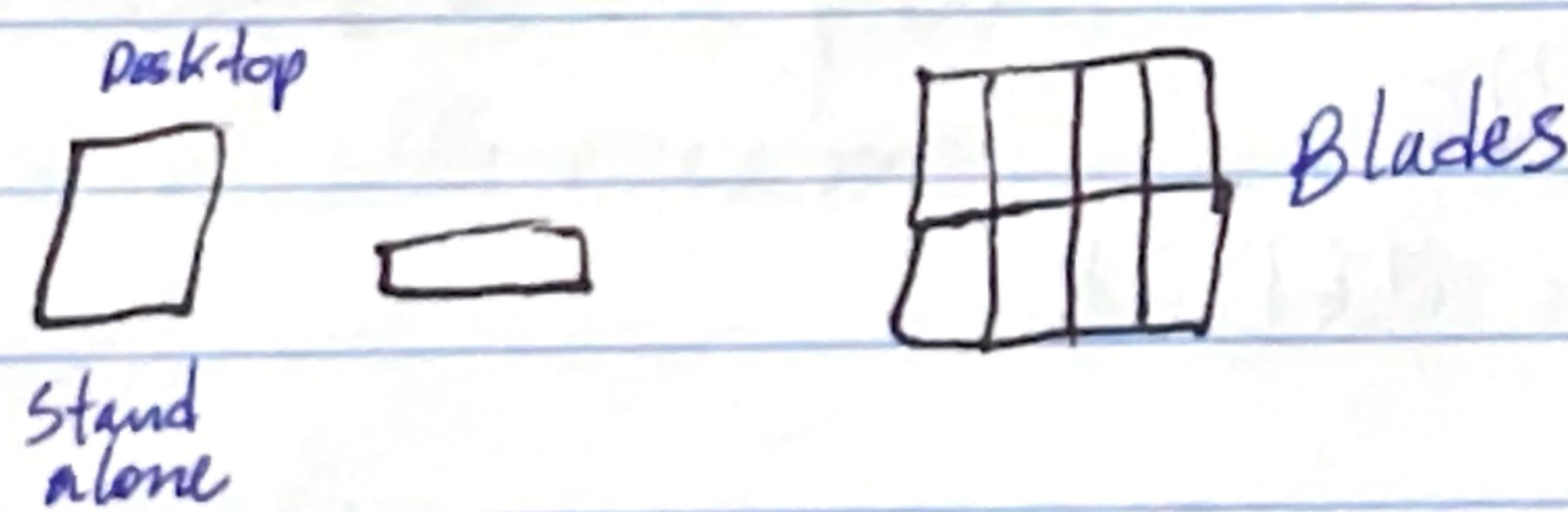
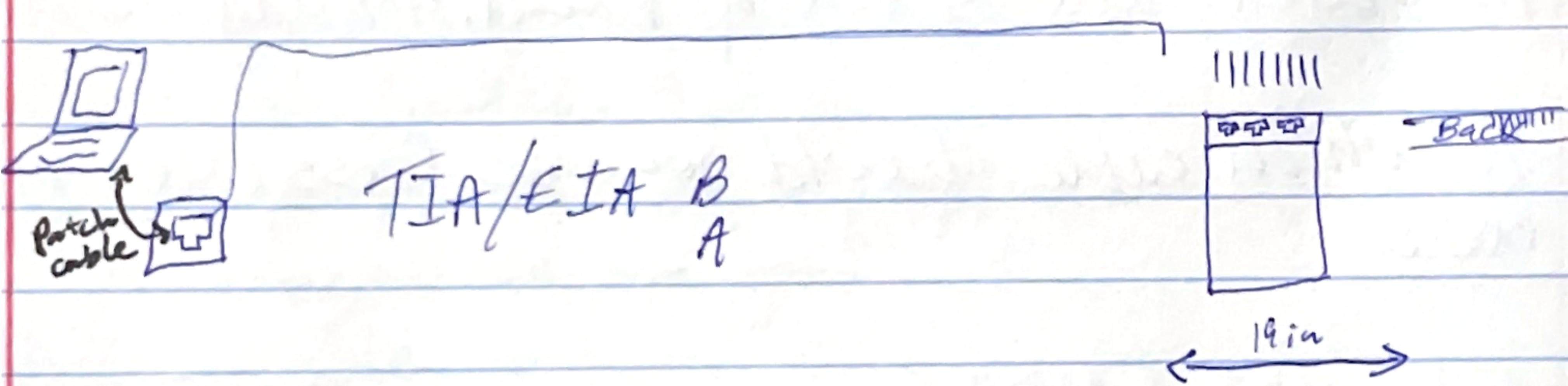
Lesson 3.2 Ethernet Switches

Media converter - Layer 1

Repeater - Layer 1

Sunny Classroom - Straightthrough Crossover, rollover - where & when to use wh ^{at?}
Ethernet UTP Patch Cable

TS68A & B



- straight
- cross
- Rollover
- 3 Router, Server, PC
- 2 switch
- 1 hub

Router $\xleftarrow{\text{straight}}$ switch
|| $\xrightarrow{\text{||}}$ hub

PC/server $\xleftarrow{\text{||}}$ switch
|| $\xrightarrow{\text{||}}$ hub

Router $\xleftarrow{\text{cross}}$ Router
|| $\xrightarrow{\text{cross}}$ PC/server

PC $\xleftarrow{\text{||}}$ PC

switch $\xleftarrow{\text{straight}}$ hub
hub $\xleftarrow{\text{cross}}$ hub

switch $\xleftarrow{\text{cross}}$ switch

* connecting to same device
is cross over.

04/15/23

In-band management

Console port



Diagram showing a connection from a console port (RJ-45) to a switch port, which then connects to a laptop.

Console port can be RJ45 or VSB.

Out of band management (roll over cable).

video

Straightthrough Cable

Cross over cable

1000Base-T

Roll over cable is out of band. management.

video

76 which cable should you use Cross over or straight ^{through} cable.

Auto MDI / MDIX

Routers + PCs use MDI

Switches + hubs use MDIX

Auto $\xrightarrow{\text{MDI}}$
 $\xrightarrow{\text{MDIX}}$

WAP- Wireless Access Point is Data link layer.

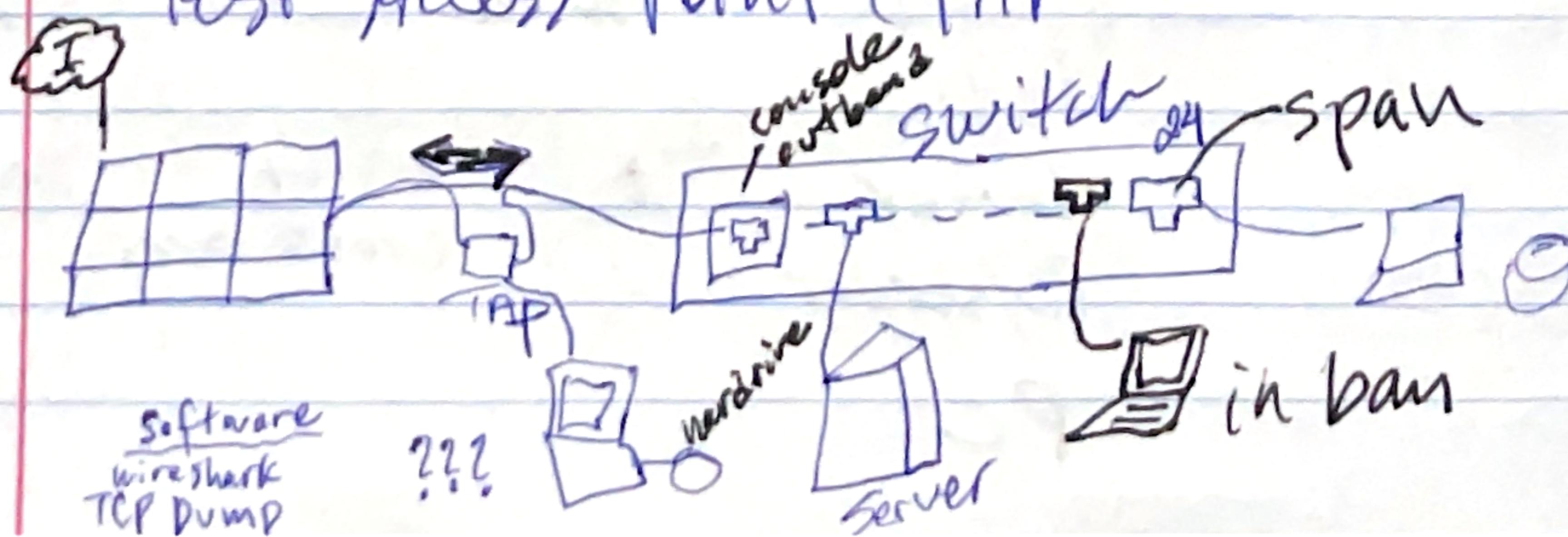
Packet Sniffers & taps

Packet Analysis

Protocol Analysis

Switched port Analyzer (SPAN)

Test Access Point (TAP)



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TAP^{or Span} - collect frames & Packets

TAP vs Span - span is particular port, and Tap is for everything from firewall to the switch.

Packet Sniffers and Taps

Network Analysis captures frames, frame by frame, "packet content"

Protocol Analysis analysis sequence of packets, protocol "sessions!"

Wireshark goal is to collect frames & packets.

Video TAP^{vs Span}: Taps provide full visibility into Network Data.

Monitoring

Span port → packets drop

Ethernet Switch Types

of ports - 4, 8, 12, 24, 48, etc...

Unmanaged vs managed.

Stackable

Modular vs. fixed

Desk vs. rack-mounted.

Modular -

Switch

MAC address table = CAM table

outgoing
addressable
memory

Port Security

- List of allowed MACs
- accept # of sticky MACs
- Enforcement action for policy violation

Port Aggregation

• combine multiple links into a single logical channel

• NIC

Characteristic: Increase bandwidth, provides redundancy

William
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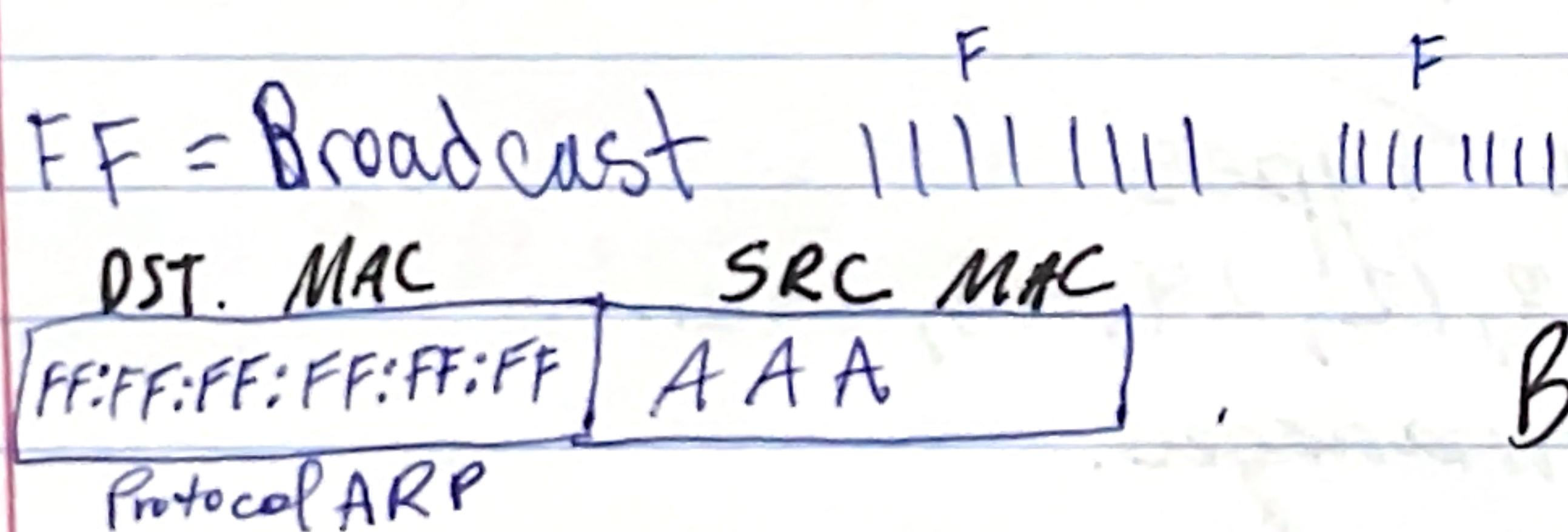
Link Aggregation Control (LACP)

auto-negotiate bonded link ^{switch} btw/ports & end system
• detect errors.

Port Mirroring: copies all packets to one or more ports

Spanning Tree Protocol

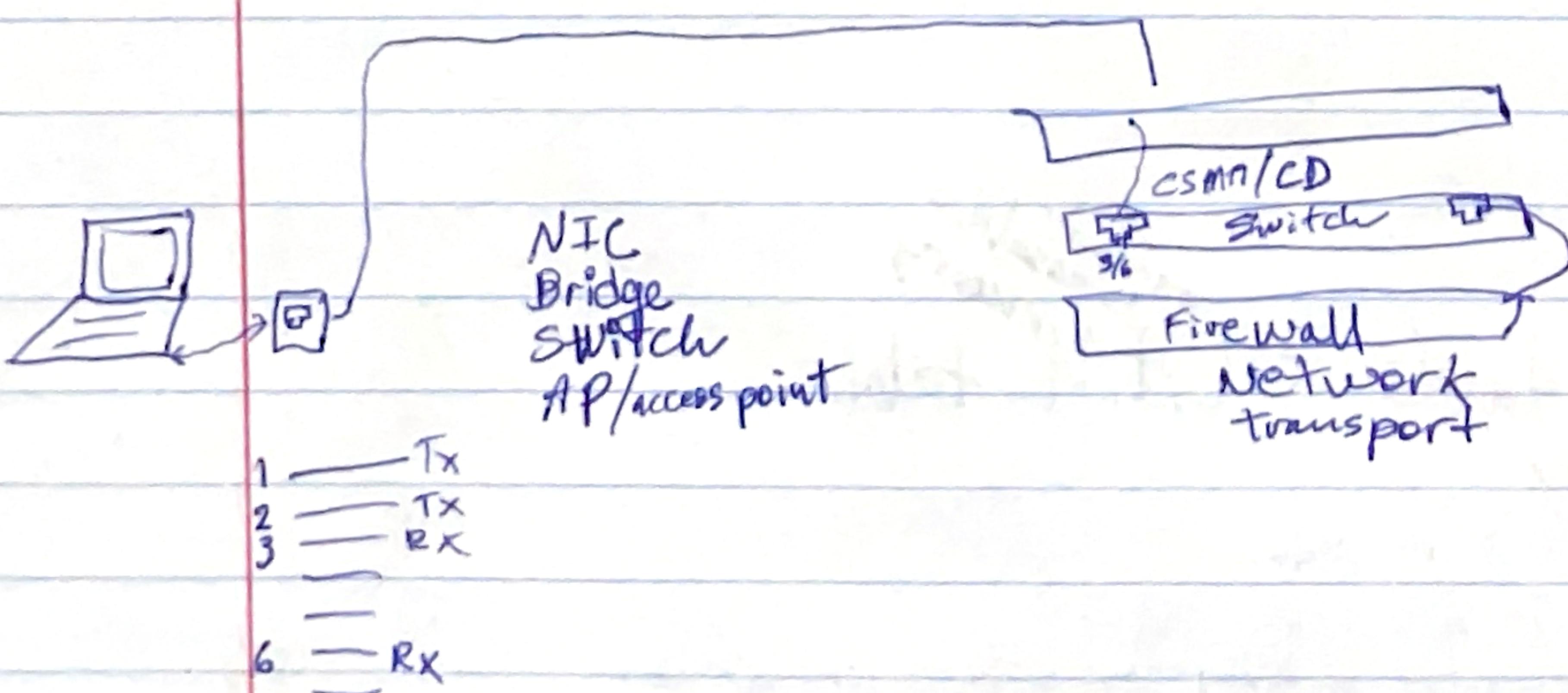
Sunny Classroom: Collision vs. Broadcast domain: Hub, switch + router
Hub - physical layer 1 creates and expands domain
Switch - Data Link Layer 2 Smaller than a hub
Router - Layer 3



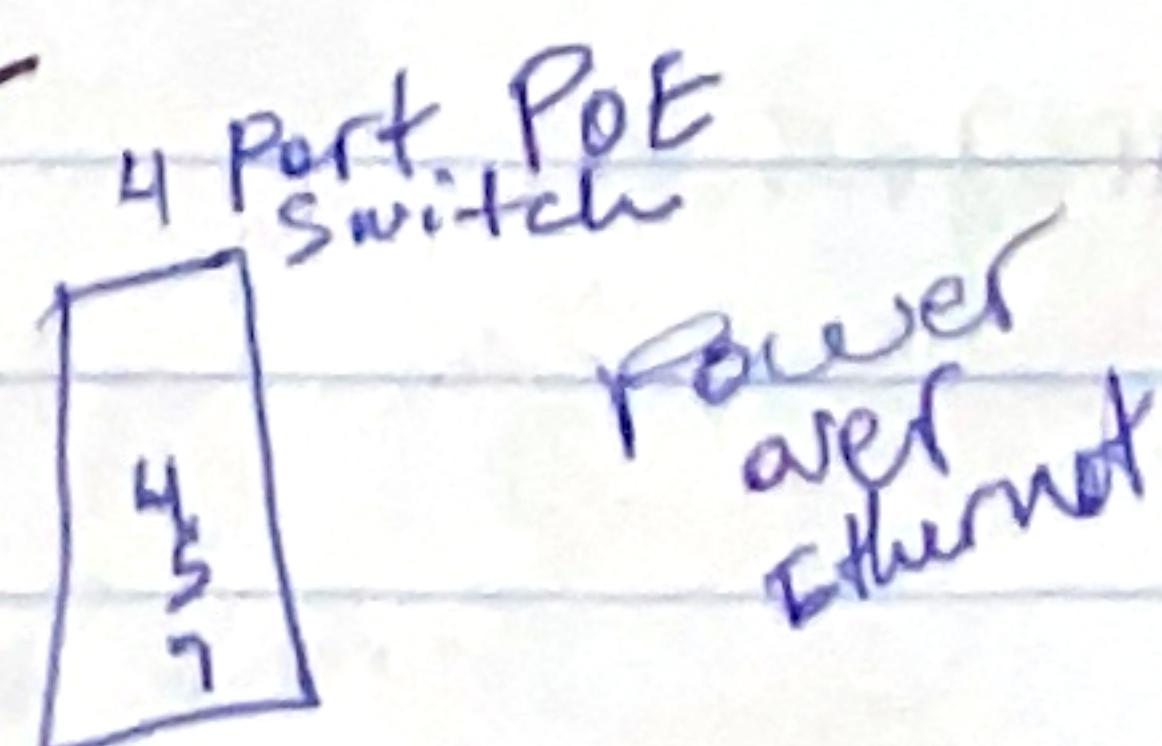
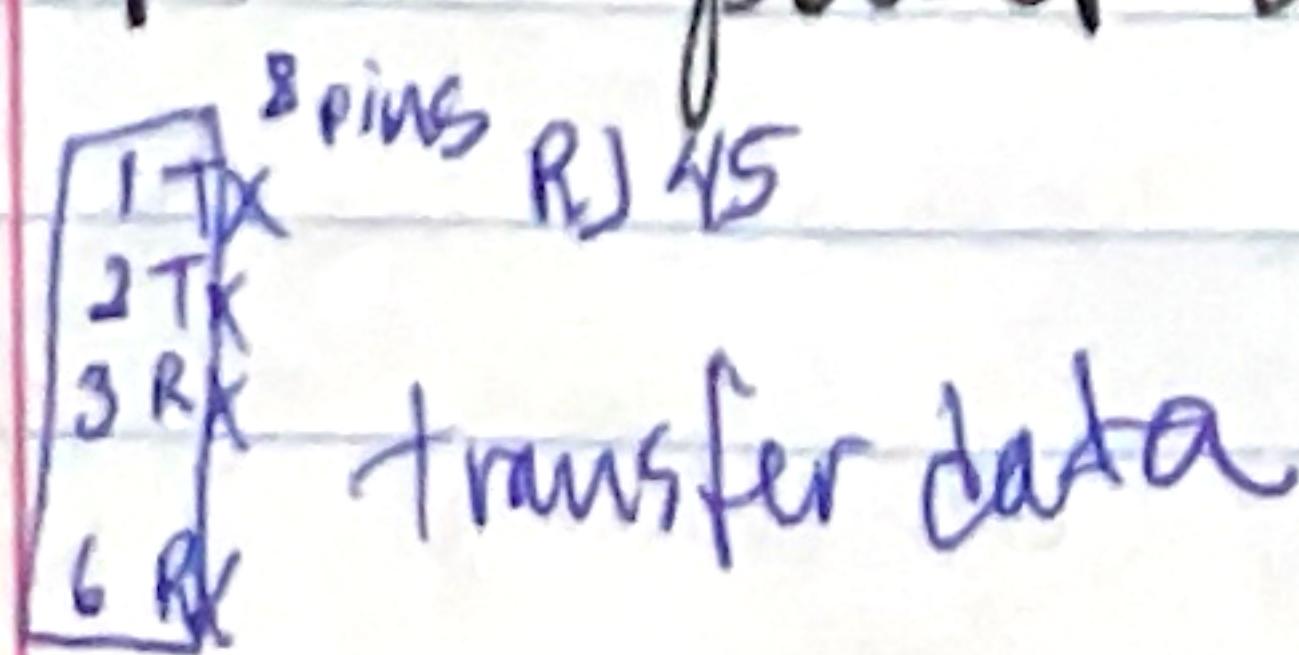
Broadcast = FF's

Collision Domain vs. Broadcast domain.

Collision happens on network where the switch will only forward data to the intended destination port.



PoE - power over ethernet



04/15/26 PoE Injector.

ComptIA Network+
1.1.8 LAB