A switch is a layer 2 device

① recognizes MAC addresses only, i.e. it can't be used to interconnect networks

② It is a transparent device ⇒ i.e. the end nodes do not know that a switch exists.

③ It is a "Plug & play" device.

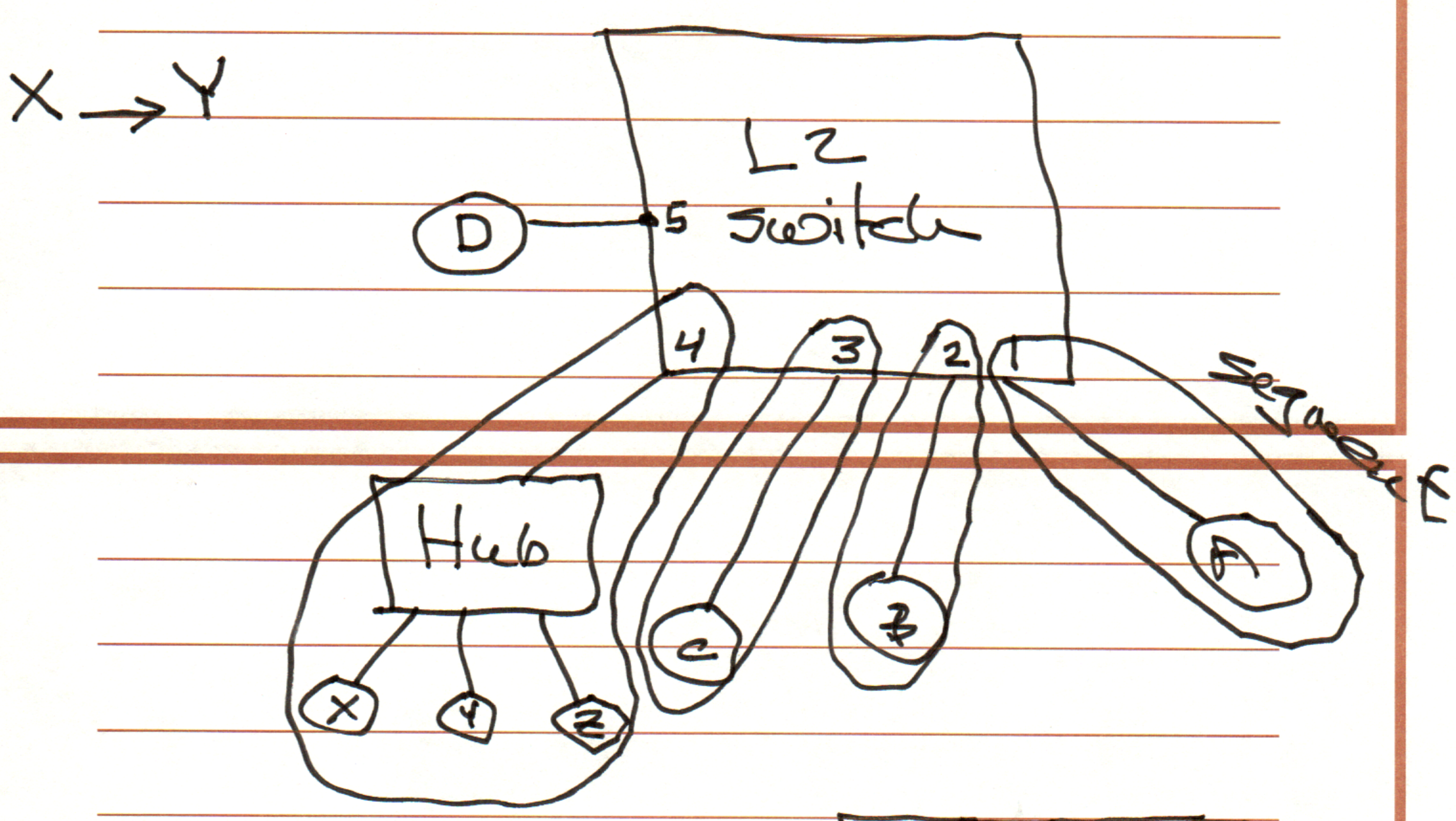
The Switch is intelligent enough to recognize the mapping between a MAC address and a physical port.

How does L2 switch "learn" about MAC addresses?

④ L2 switches can be in the following three modes

Filtering, Forwarding, Flooding modes

Filtering: If the source MAC address and destination MAC address are on the same segment i.e. they share the same port



port 4 is shared
ports 1, 2, 3 are dedicated.

Port #	MAC address
1	A
2	B
3	C
4	X
4	Y
4	Z

Forwarding: If the source & destination nodes are located on different segments, the switch will forward the frame to the destination node only.

A → B X → A

concept

Flooding (same as broadcasting but not exactly identical)

the switch will be in the flooding mode if the destination MAC address is unknown to the switch

≡ switch mimic the hubs.

i.e. it will forward the frame to all ports except the one where it came from.

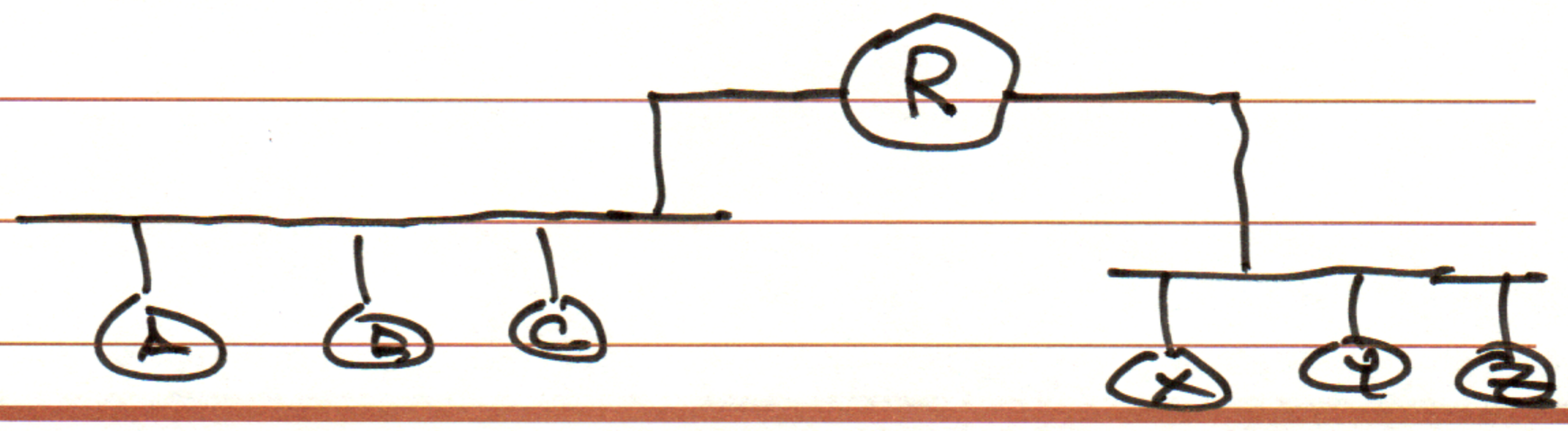
A → D

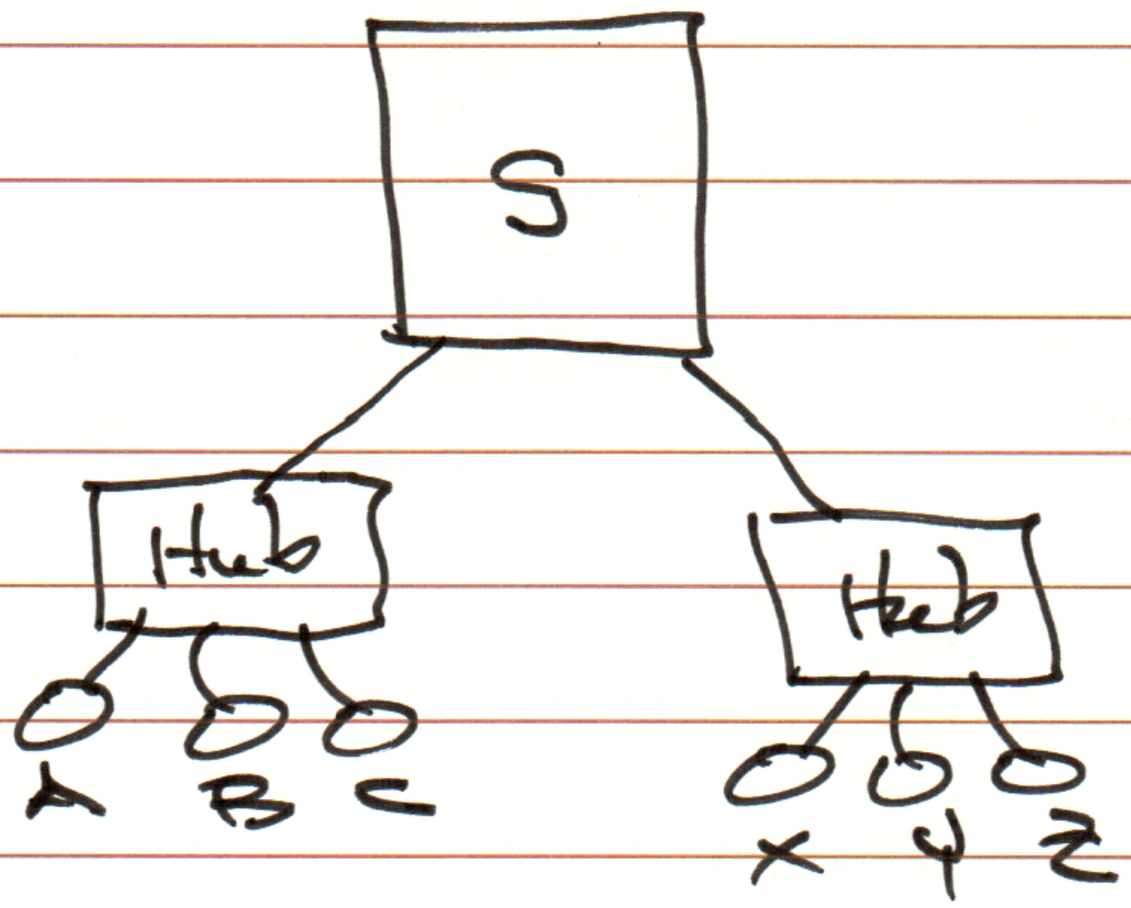
X → D

L2

⑤ a ↑ Switch does not isolate broadcast domain

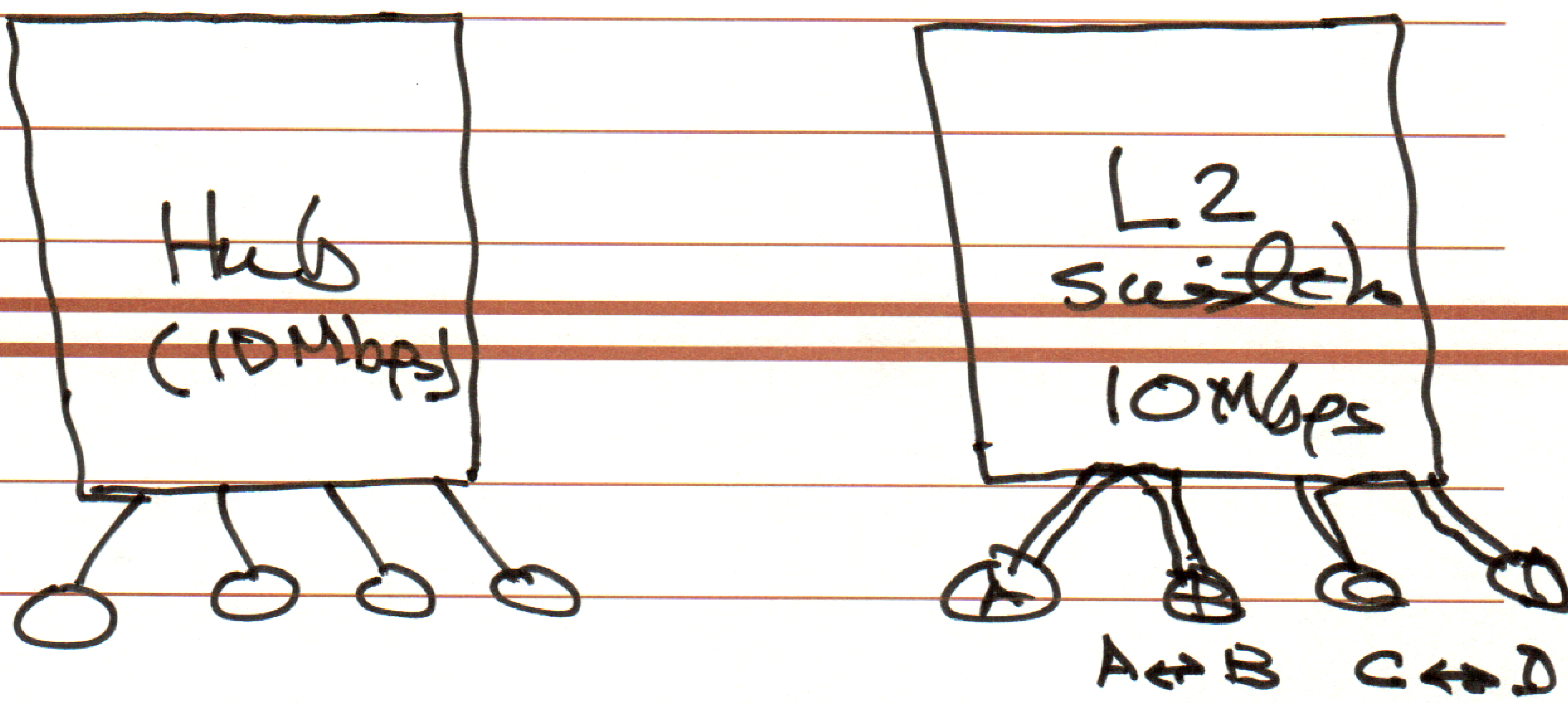
a broadcast is a set of nodes receiving a broadcast frame.





(6) L2 Switches isolate collision domains

a collision domain is a set of nodes competing for same resource.



every port supports 10Mbps.

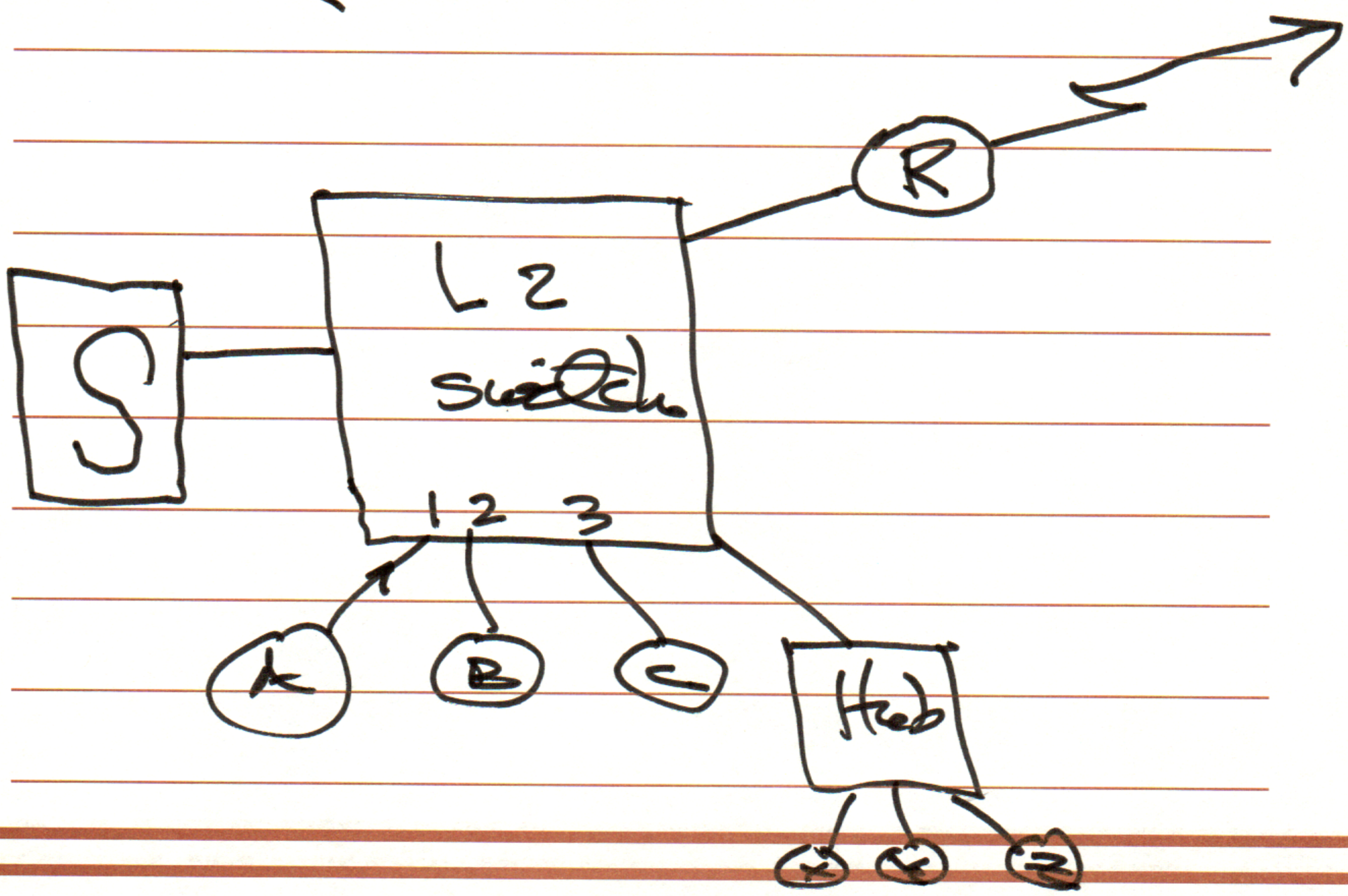
Switch throughput 40 Mbps

Hub Throughput = 10Mbps

average node throughput = 2.5 Mbps

node throughput = 10Mbps

Learning Switches



A → B
(Flooding)

Port #	MAC	TTL
1	A	
3	C	
4	Y	

C → X
(Flooding)

Y → A
(Forwarding)

- Store & forward L2 switches
- Cut-through switching.

10/100/1000 Mbps