

Enterprise networks

Virtual Local Area Networks

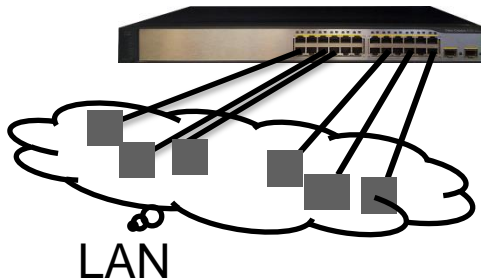
Béatrice Paillassa

What is a Virtual Local Area Network?

LAN = Broadcast domain : all elements receiving broadcast frames

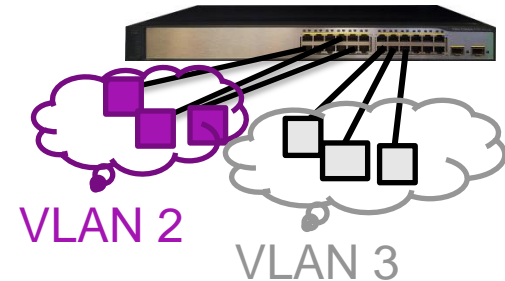
Hardware LAN

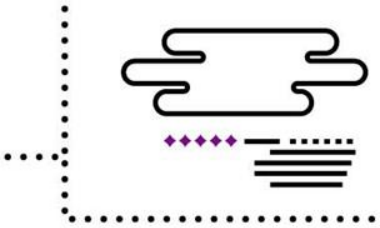
→ hardware connection



Virtual LAN

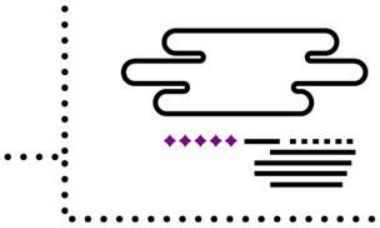
→ hardware connection
⊕ software rules





VLAN definition rule

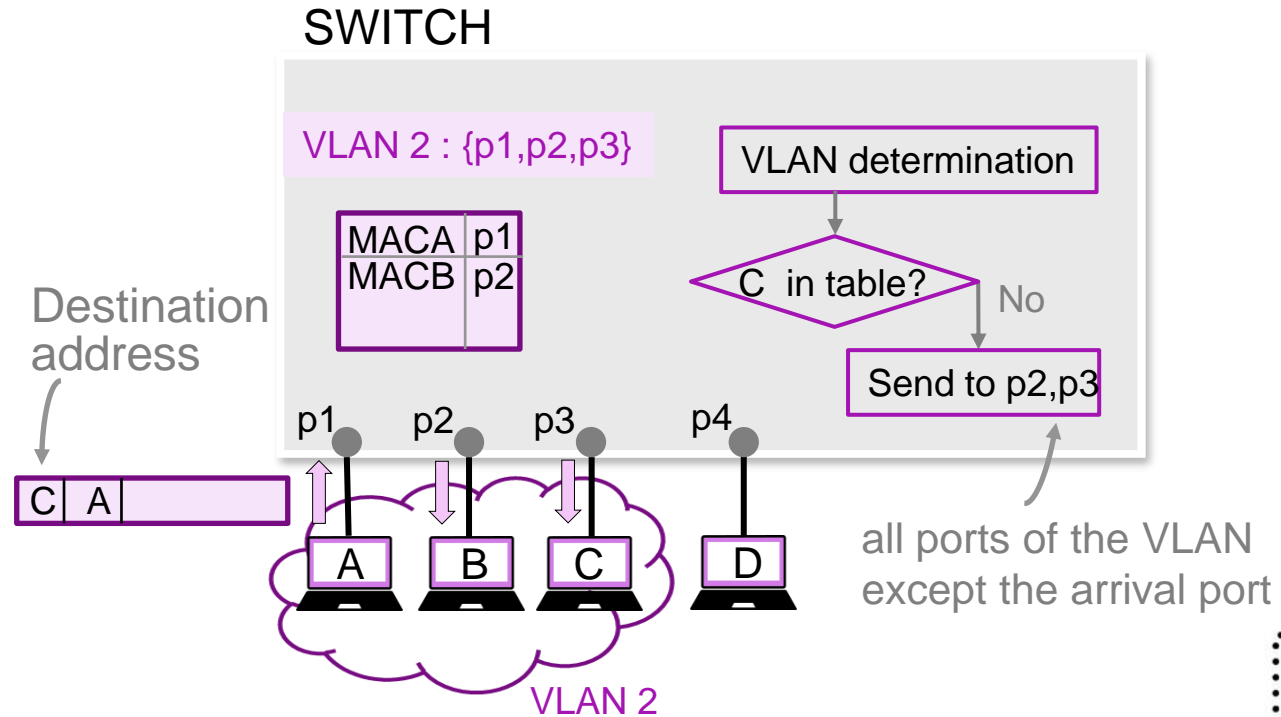
- Depends on the administrator policy
 - Port policy
 - > Port1 is in VLAN 2
 - Address policy
 - > MAC 01:22:33:45:A6:E6 is in VLAN 2
 - > IP 10.0.0.0 is in VLAN 2
 - Application policy
 - > VoIP is in VLAN 2



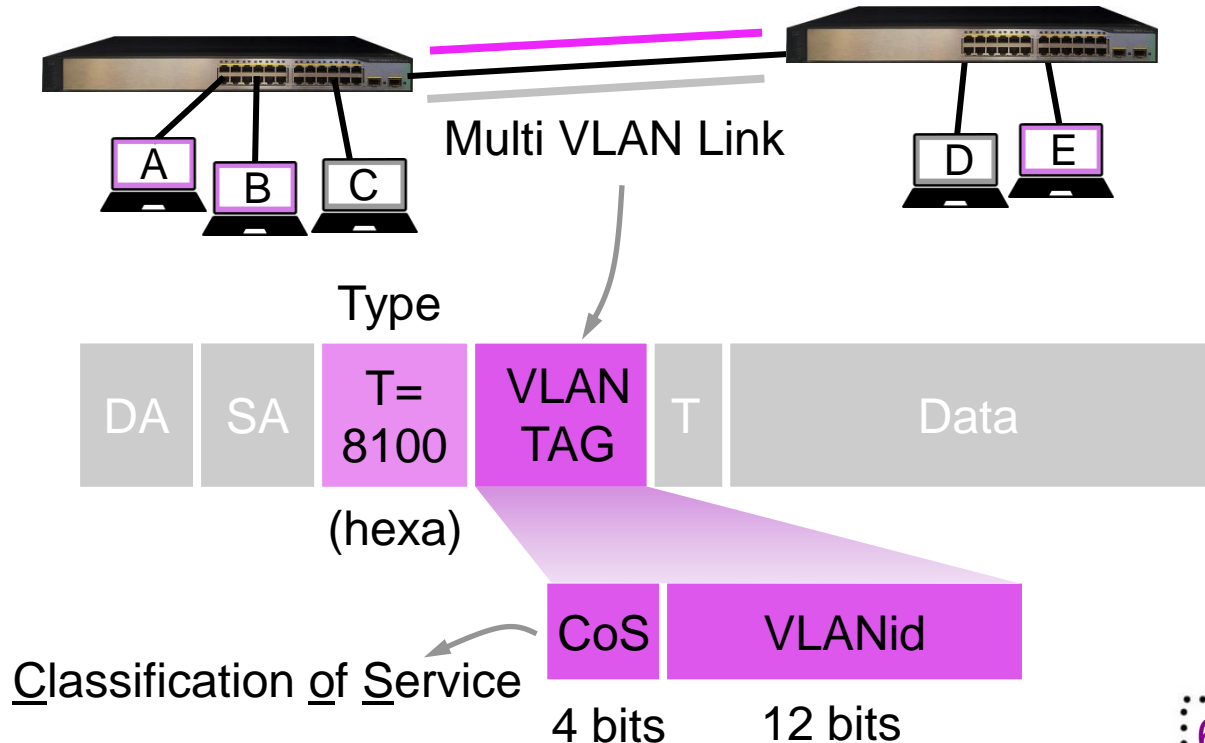
VLAN functioning

- Based on MAC forwarding table
- One forwarding table per VLAN
- Forwarding tables are managed by IEEE 802.1 algorithm

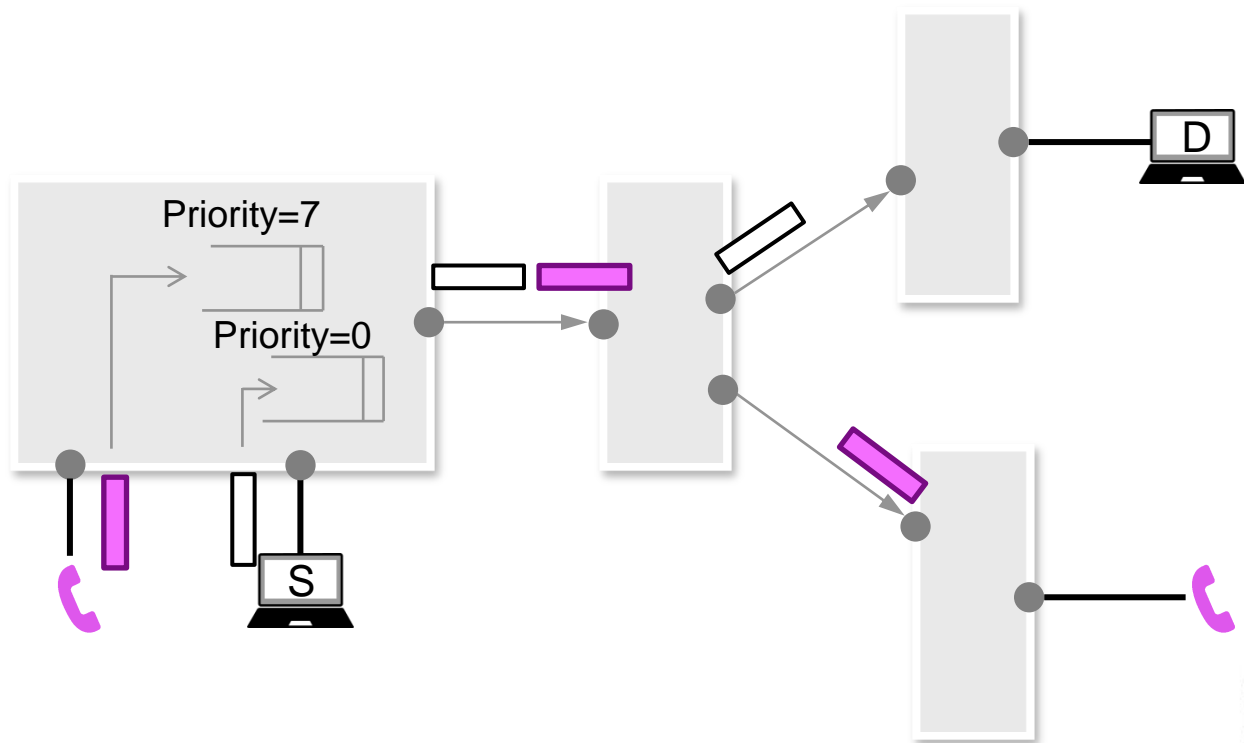
VLAN functioning - illustration

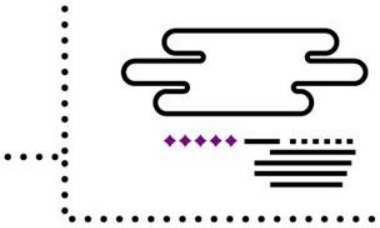


Impact of VLAN on Ethernet frame



Priority forwarding illustration





Interest of VLAN

- **Performance** is improved
 - broadcast domain is limited to one VLAN
- **Flexibility** by software configuration
- **Security** is improved
 - stations belonging to two different VLANs cannot communicate (≠ Router)

Summary

- Many VLAN are supported on the same hardware LAN
- VLAN is software defined by administrator
- Ethernet frame is tagged on a link belonging to multiple VLANs

