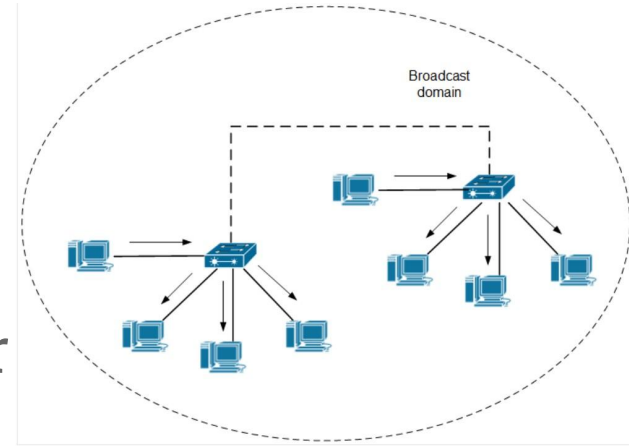# VLANs
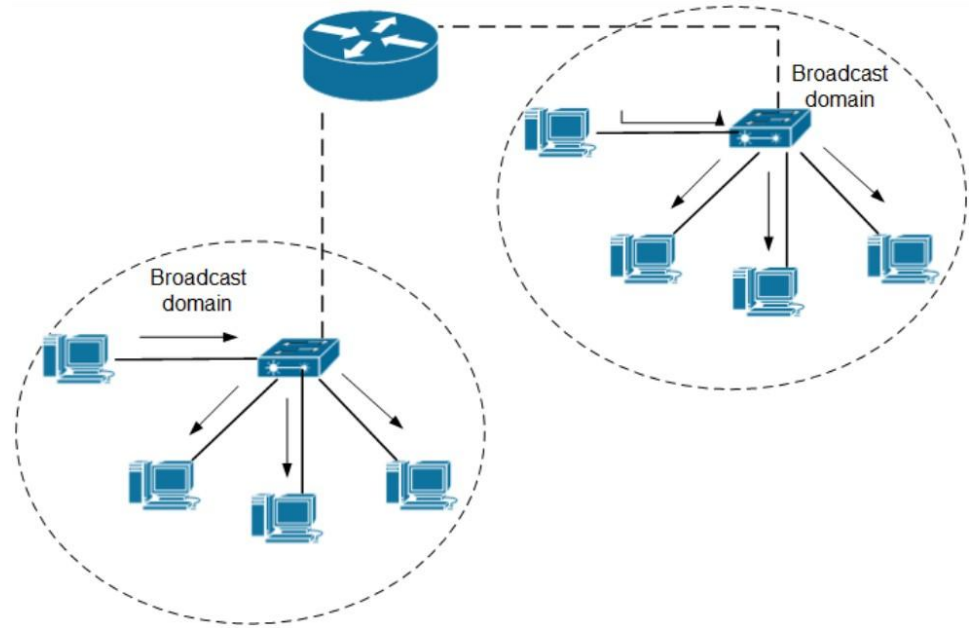
- We know that ARP messages are broadcast.
- Everytime a host gets a broadcast message, it has to processed

So: broadcast messages consume processing power and bandwidth within a network

- all hosts inside a network belong to one broadcast domain, so if turns out to be too big, we can split the network in two, can't we?
- why does this solution not scale?


Broadcast domain

Broadcast domain

VLANs can divide a physical network into several LANs which are logically separated. Every LAN has it's own broadcast domain.

In the picture. communication in between sales hosts and marketing hosts is not possible!

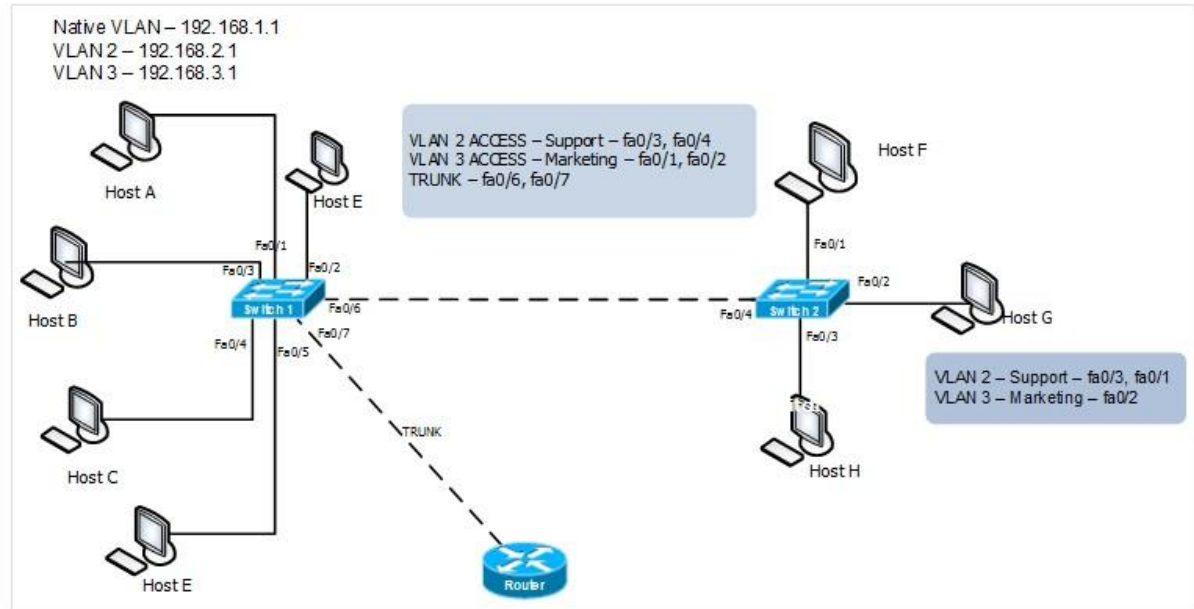Hosts don't have to be physically close to be logically in the same network.

sales   marketing

equivalent to:

Sales VLAN   MKT VLAN   MKT VLAN   Sales VLAN
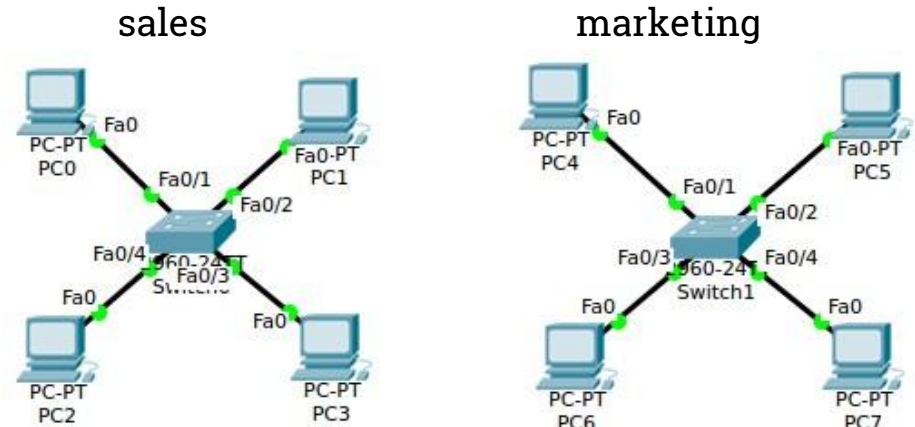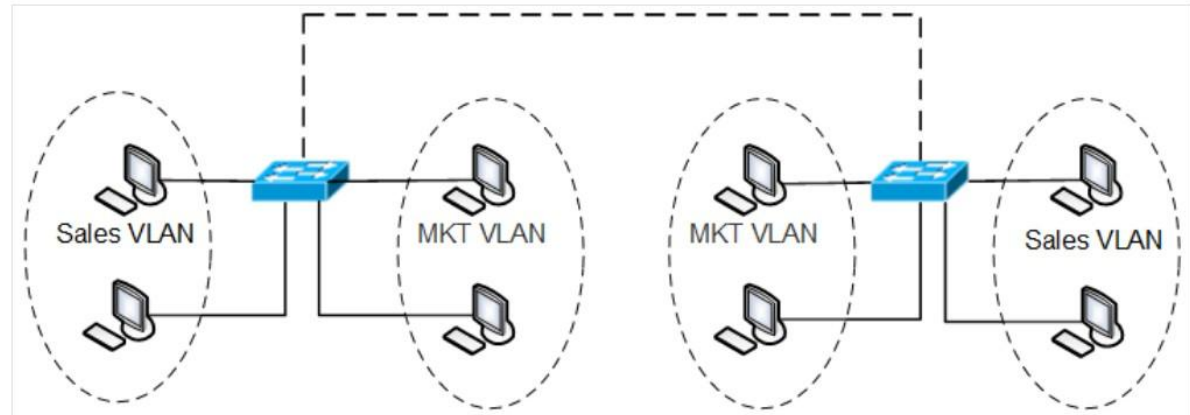
how to connect Vlans?

- ▸ access ports: configured to be used by one specific VLAN
- ▸ trunk ports: will forward frames of multiple VLANs
- ▸ several virtual interfaces in the router are implemented with .q notation

Native VLAN – 192.168.1.1
VLAN 2 – 192.168.2.1
VLAN 3 – 192.168.3.1

VLAN 2 ACCESS – Support – fa0/3, fa0/4
VLAN 3 ACCESS – Marketing – fa0/1, fa0/2
TRUNK – fa0/6, fa0/7

VLAN 2 – Support – fa0/3, fa0/1
VLAN 3 – Marketing – fa0/2

Host A
Host B
Host C
Host E
Host E
Host F
Host G
Host H

Fa0/1
Fa0/3
Fa0/2
Fa0/6
Fa0/4
Fa0/7
Fa0/5

Fa0/1
Fa0/2
Fa0/4
Fa0/3

Switch 1
Switch 2
Router
TRUNK

the modified ethernet header

when traffic is forwarded by switches, a tag is added to the header to distinguish in between different vlans.
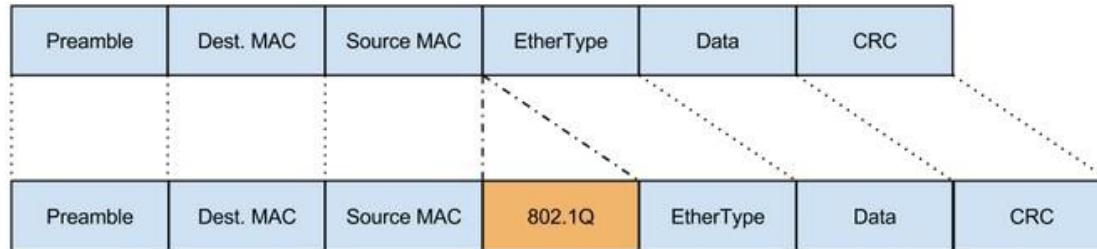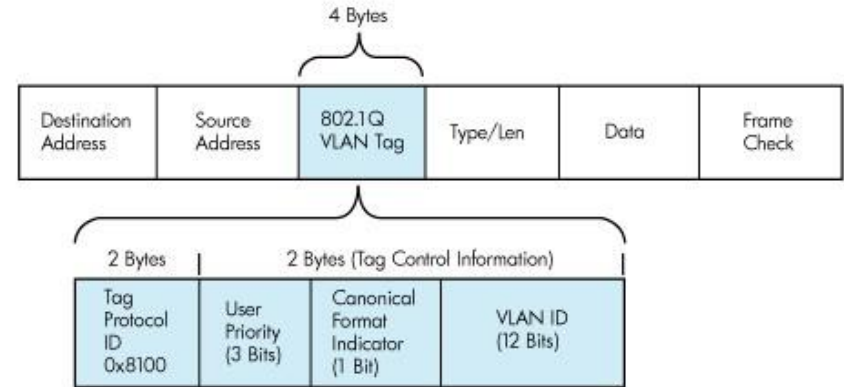
Resources

▸ https://documentation.meraki.com/zGeneral_Administration/Tools_and_Troubleshooting/Fundamentals_of_802.1Q_VLAN_Tagging

▸ https://www.oreilly.com/library/view/network-warrior/9780596101510/ch04.html

▸ http://www.mustbegeek.com/understanding-vlans-in-switching-world/