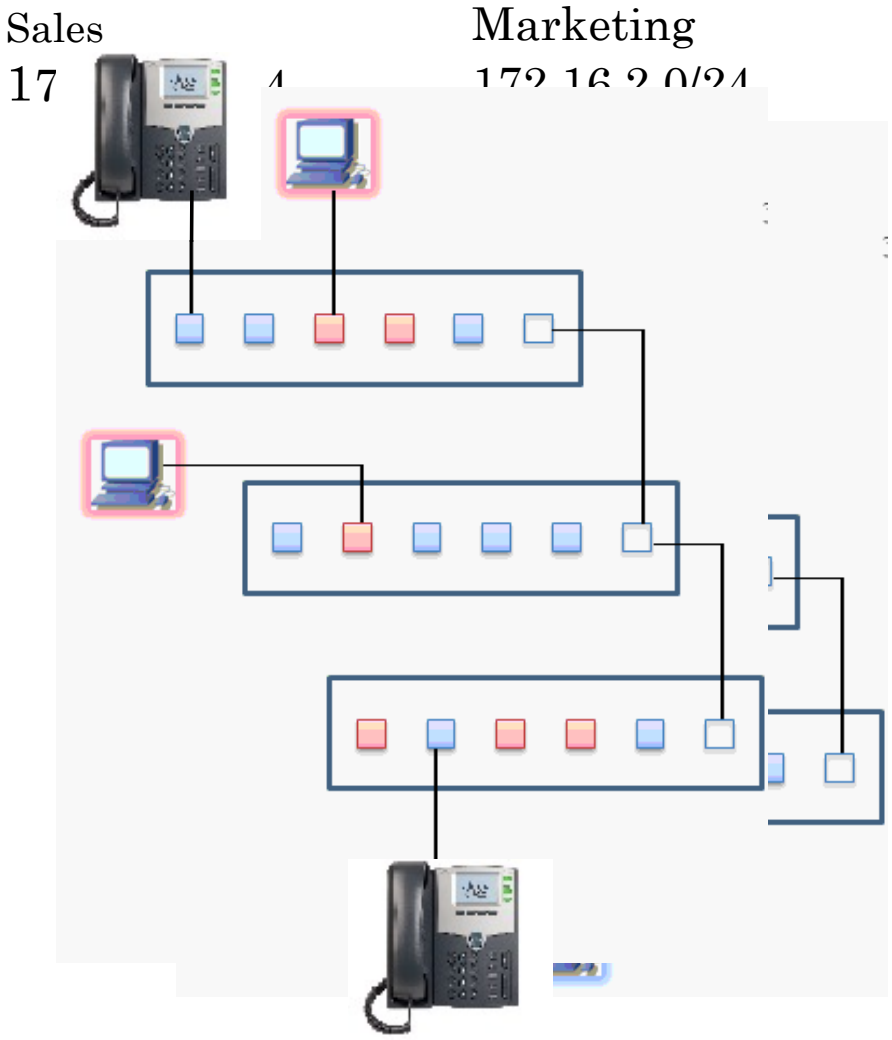
Switch Vlan

Understanding vlan and Trunks

- The view of “normal switch”
- Defining Vlan and Trunks
- The Flexibility of Vlan
- Understand how trunks really work
- The 802.1Q protocol

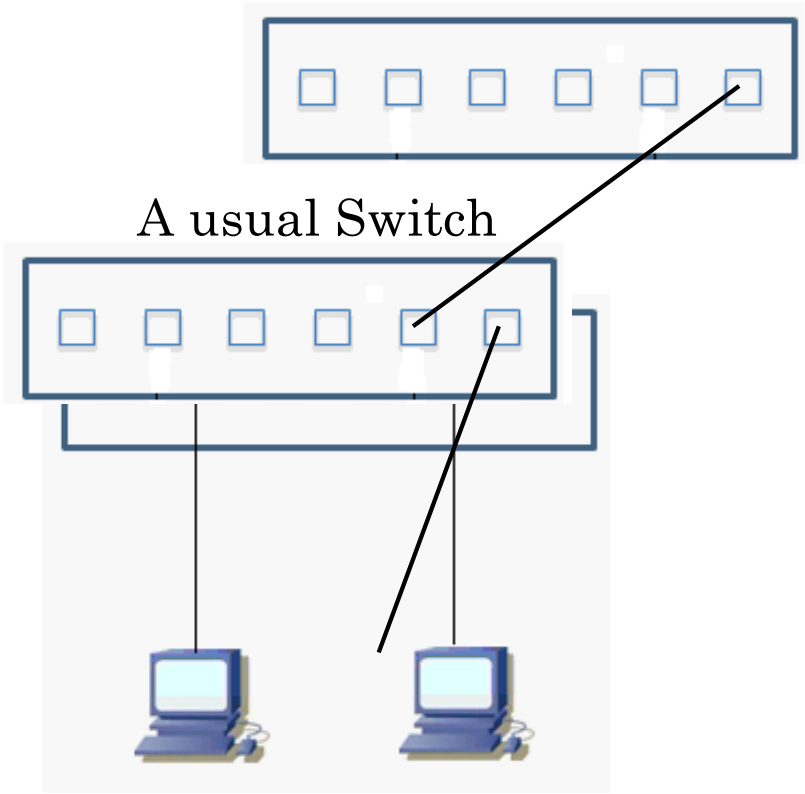
VLAN FUNDATION



- Vlan is a Switching Technology
- Logically group users
- Segment broadcast domains
- Subnet correlation
  - Vlan=BD=Subnet
- Access Control
- Quality of service

BD- Broadcast Domain

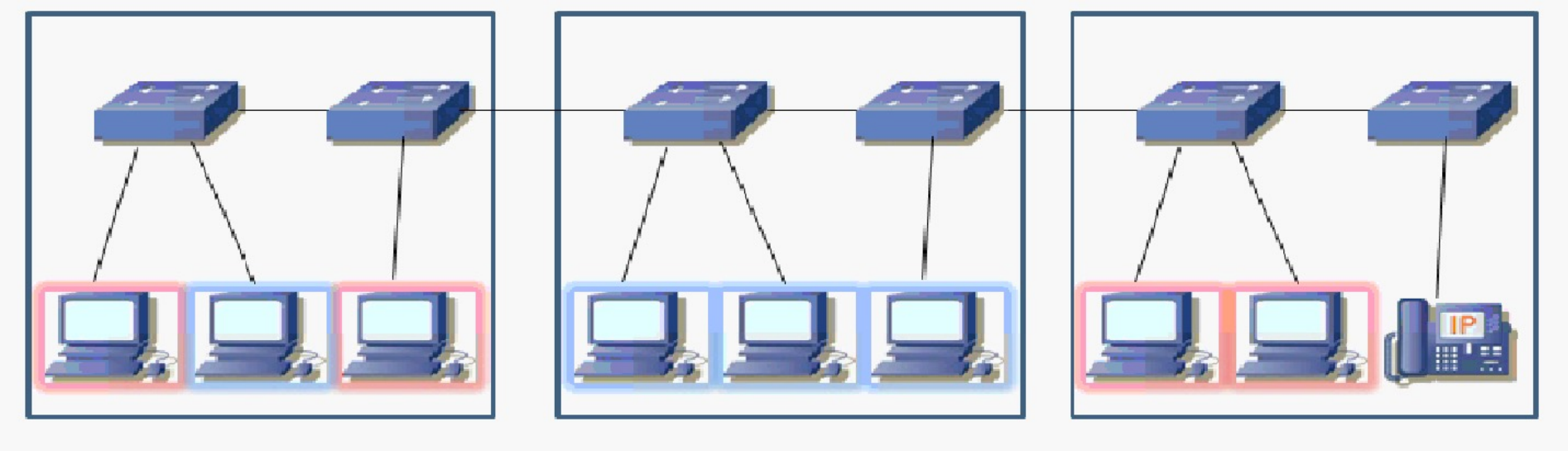
The normal Switching World



- One Collision Domain per port
- Broadcast sent to all ports
- One subnet per LAN
- Very limited access control

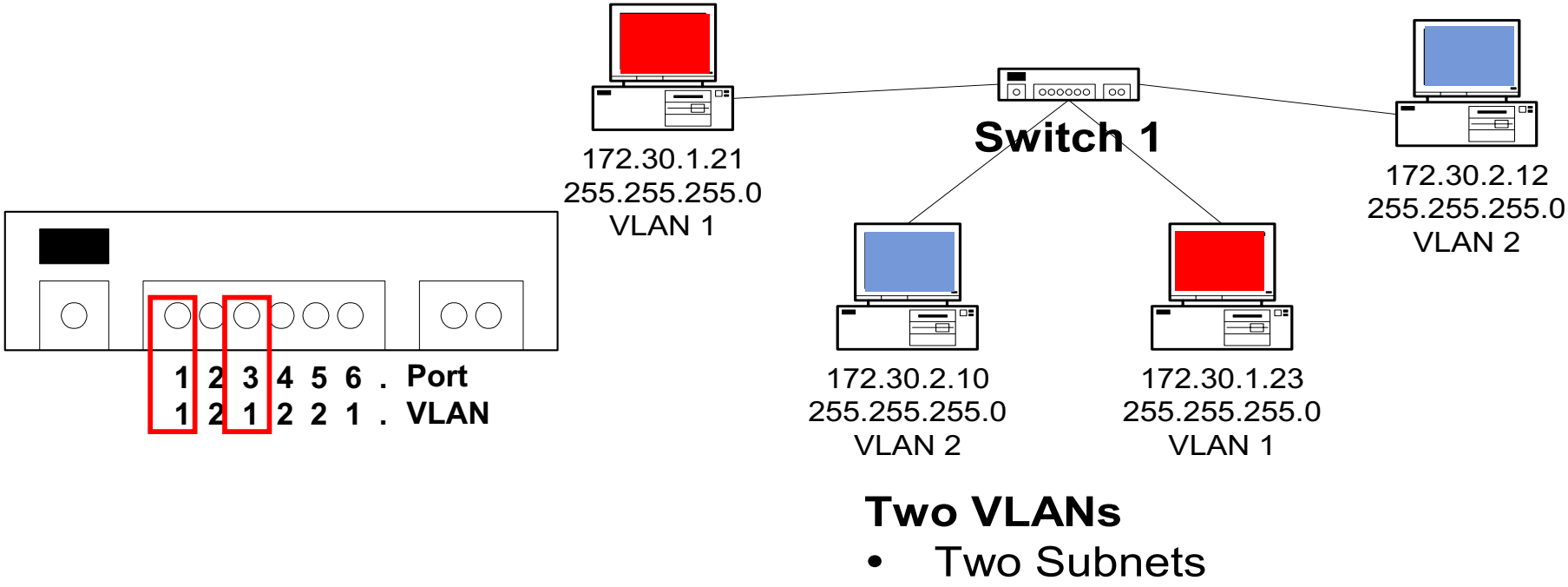
Flexibility of Vlan

Building A Building B Building C



- Segmentation of users with out routers
- No longer limited to physical location
- Tighter control of broadcast

VLAN OPERATION



Two VLANs

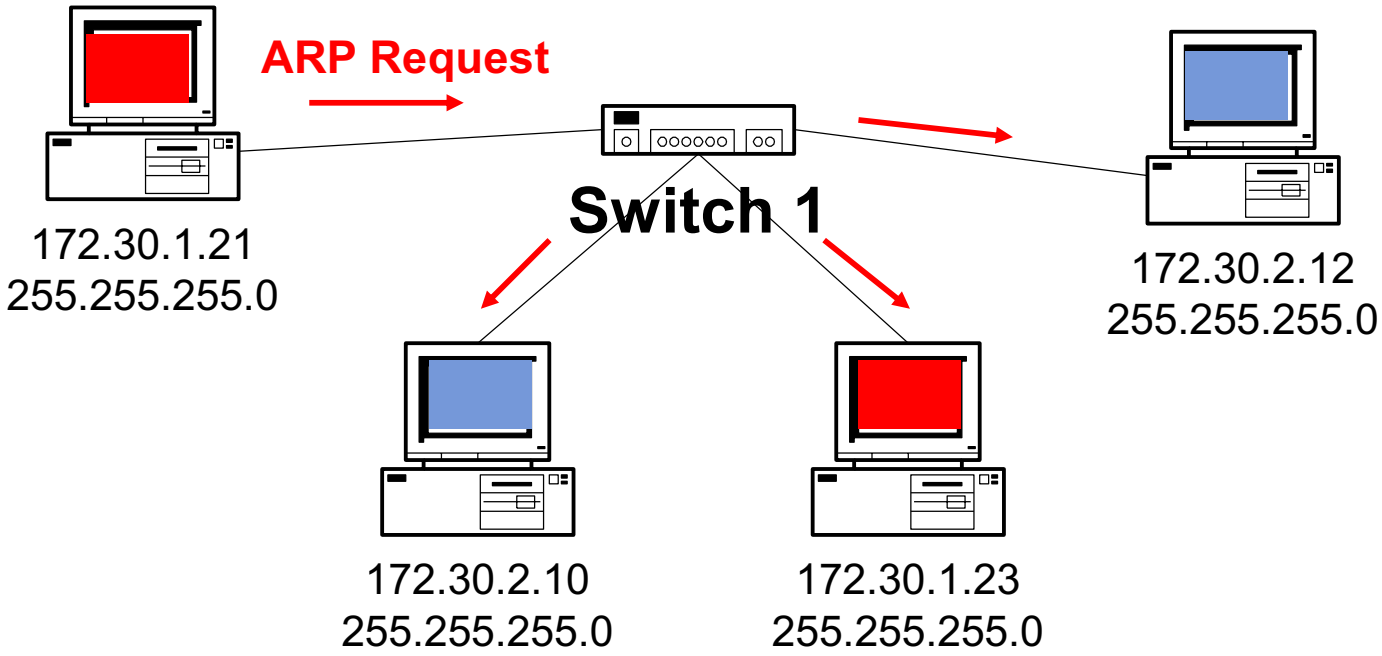
- Two Subnets

Important notes on VLANs:

1. VLANs are assigned on the switch port. There is no "VLAN" assignment done on the host (usually).
2. In order for a host to be a part of that VLAN, it must be assigned an IP address that belongs to the proper subnet.

   Remember: VLAN = Subnet
3. Assigning a host to the correct VLAN is a 2-step process:
   1. Connect the host to the correct port on the switch.
   2. Assign to the host the correct IP address depending on the VLAN memebership

Without VLANs – No Broadcast Control

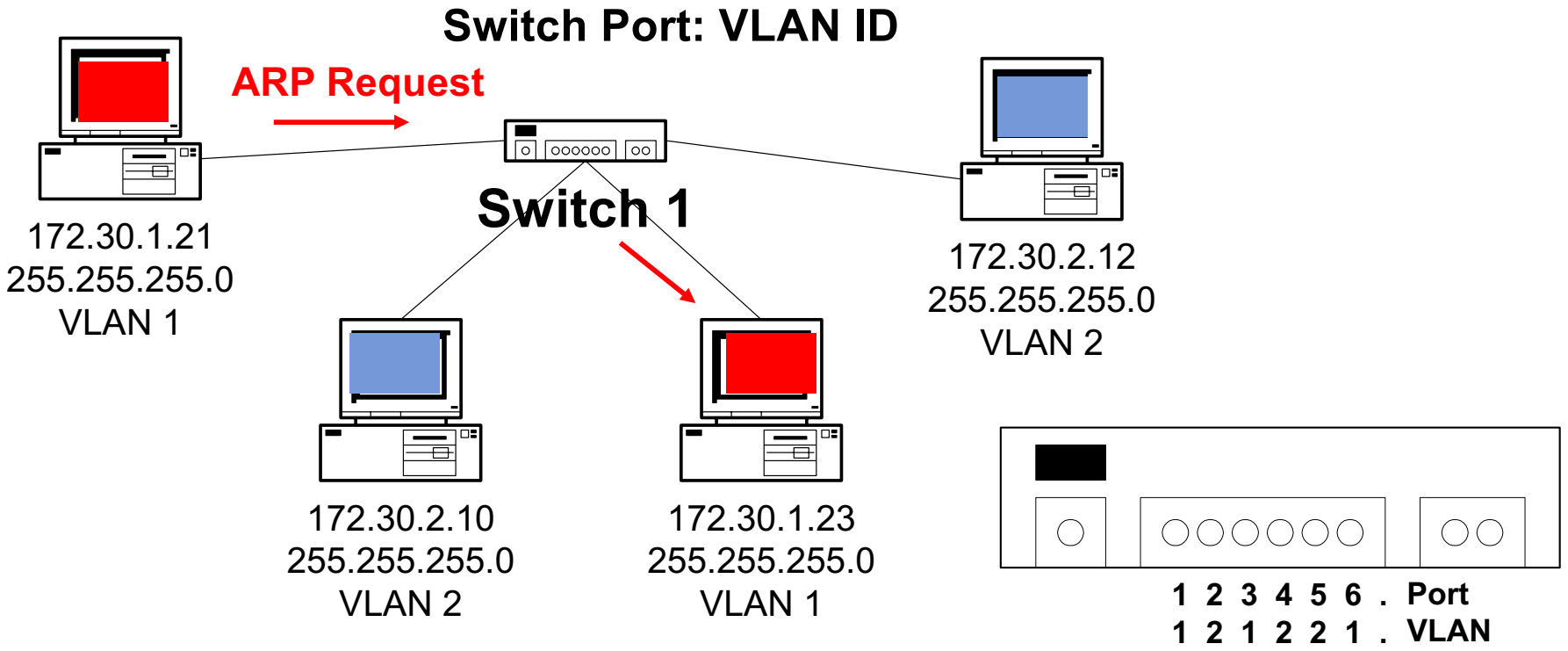


No VLANs

- Same as a single VLAN
- Two Subnets

- Without VLANs, the ARP Request would be seen by all hosts.
- Again, consuming unnecessary network bandwidth and host processing cycles.

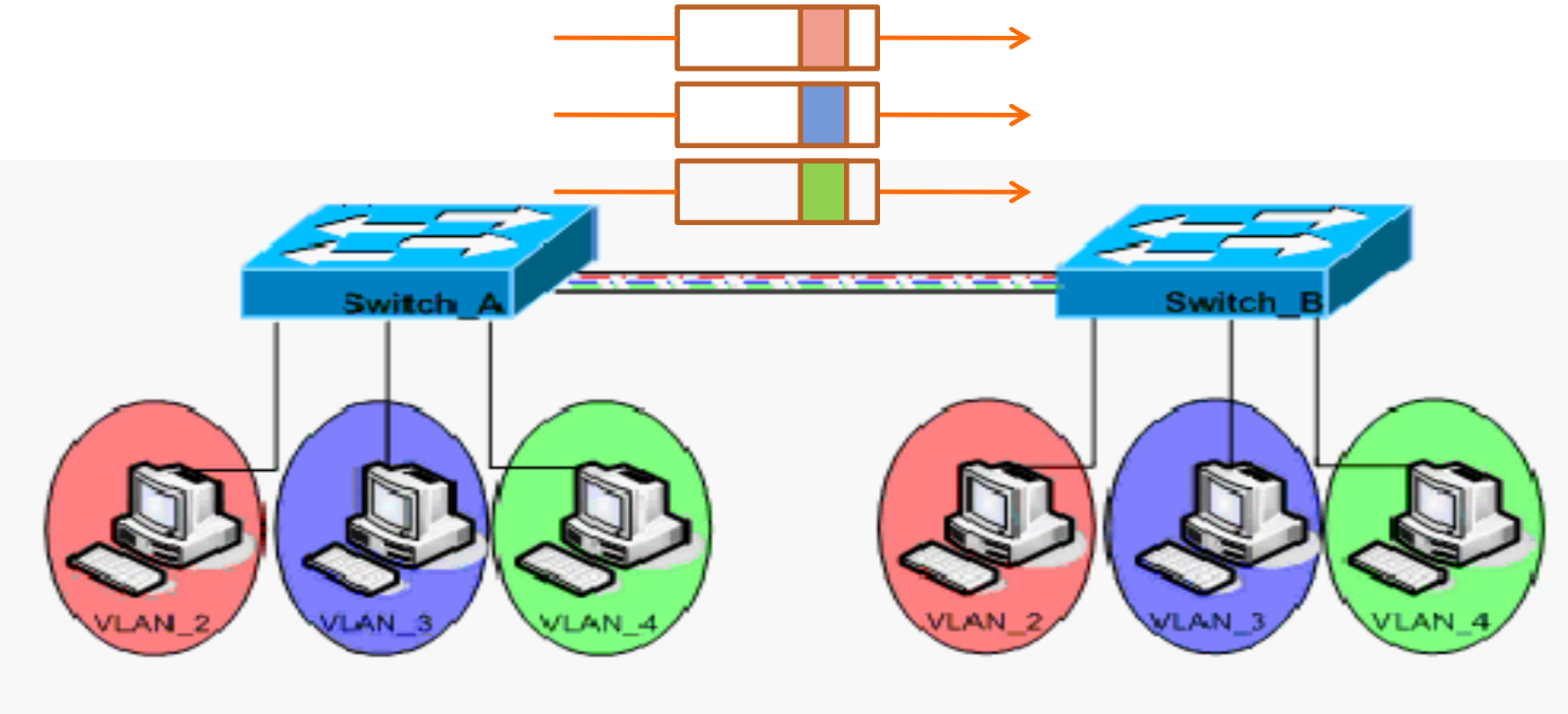
With VLANs – Broadcast Control



Two VLANs

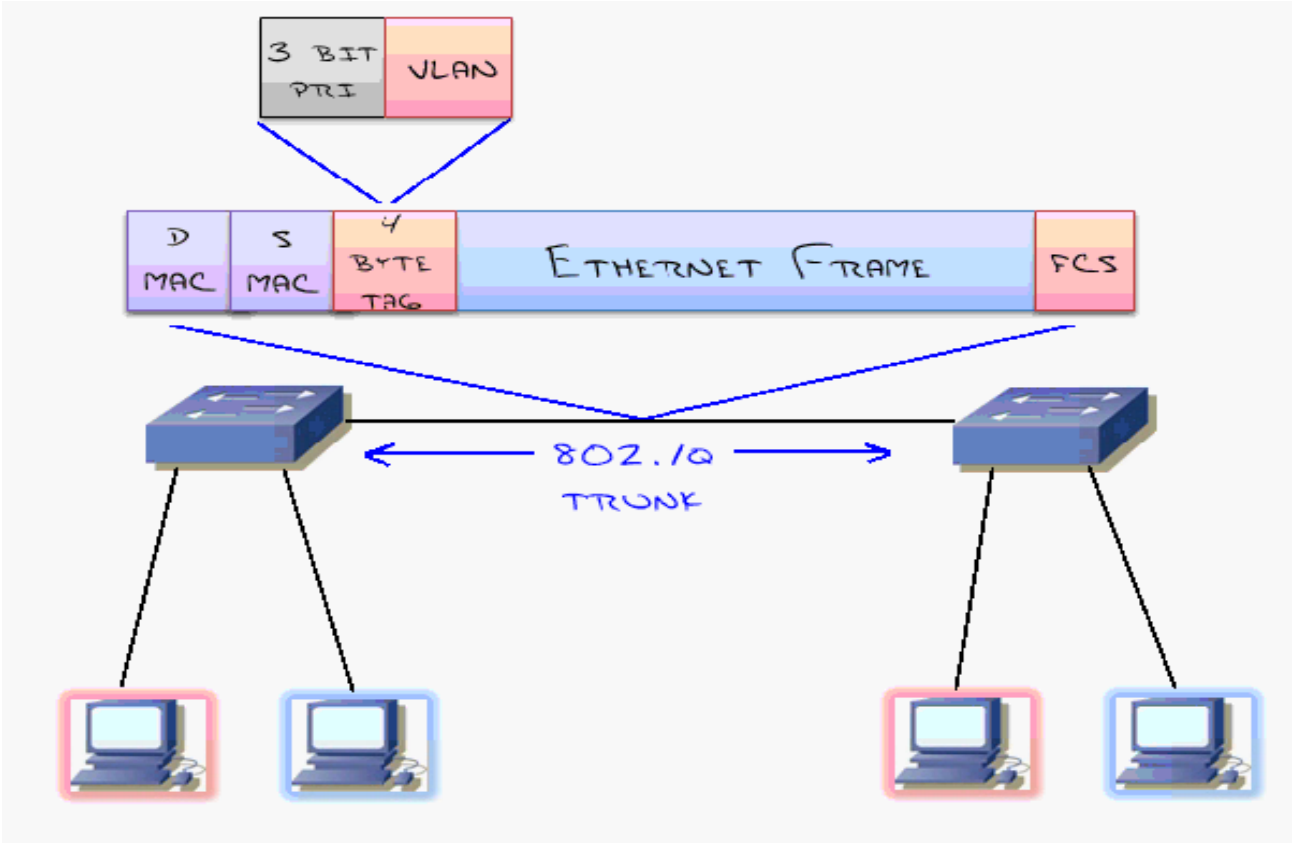
- Two Subnets

WHAT IS TRUNKING?



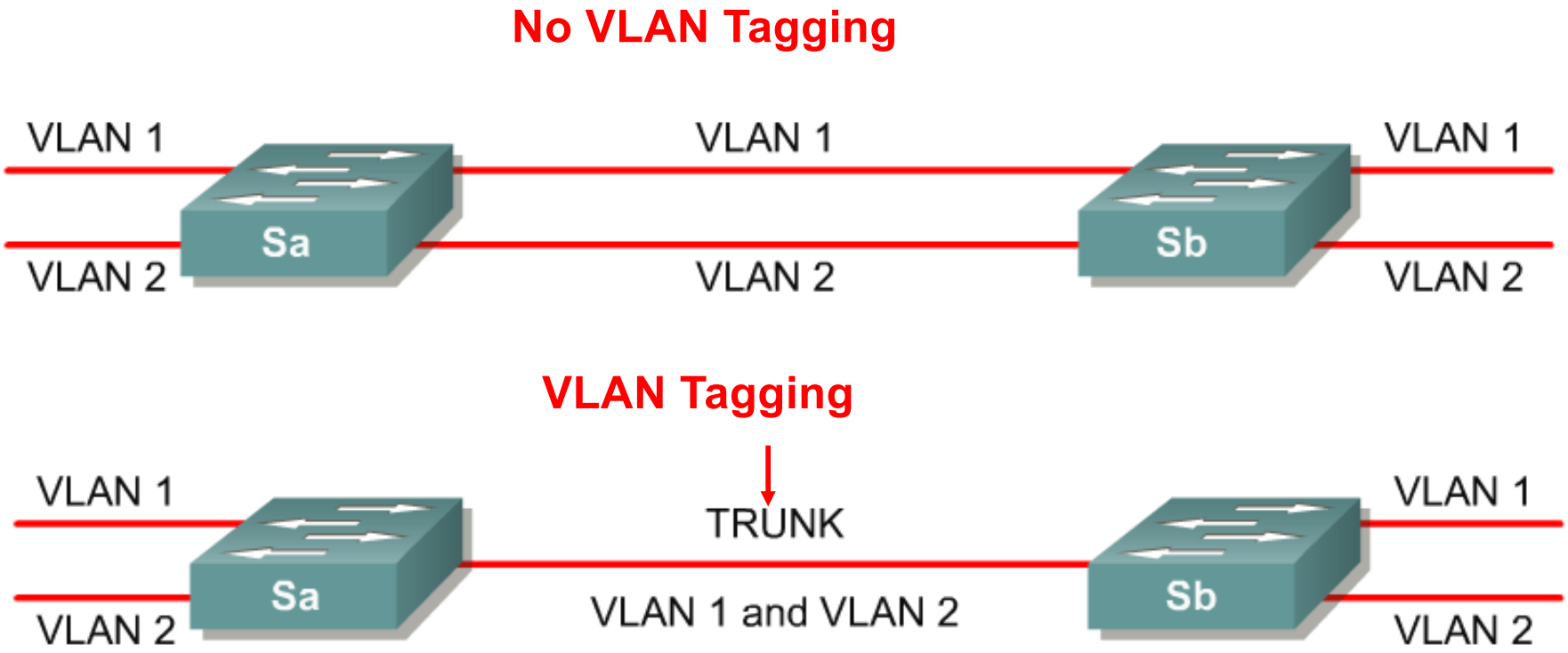
- Truncking (also known as tagging) passes multi-VLAN information between switches
- Places VLAN information into each frame
- Layer 2 feature

THE TRUNKING LANGUAGE: 802.1Q



- This protocol is industry standard protocol.
- First 3 bites are used for prioritizing
- 12 bits are used for Vlan ID (4094)

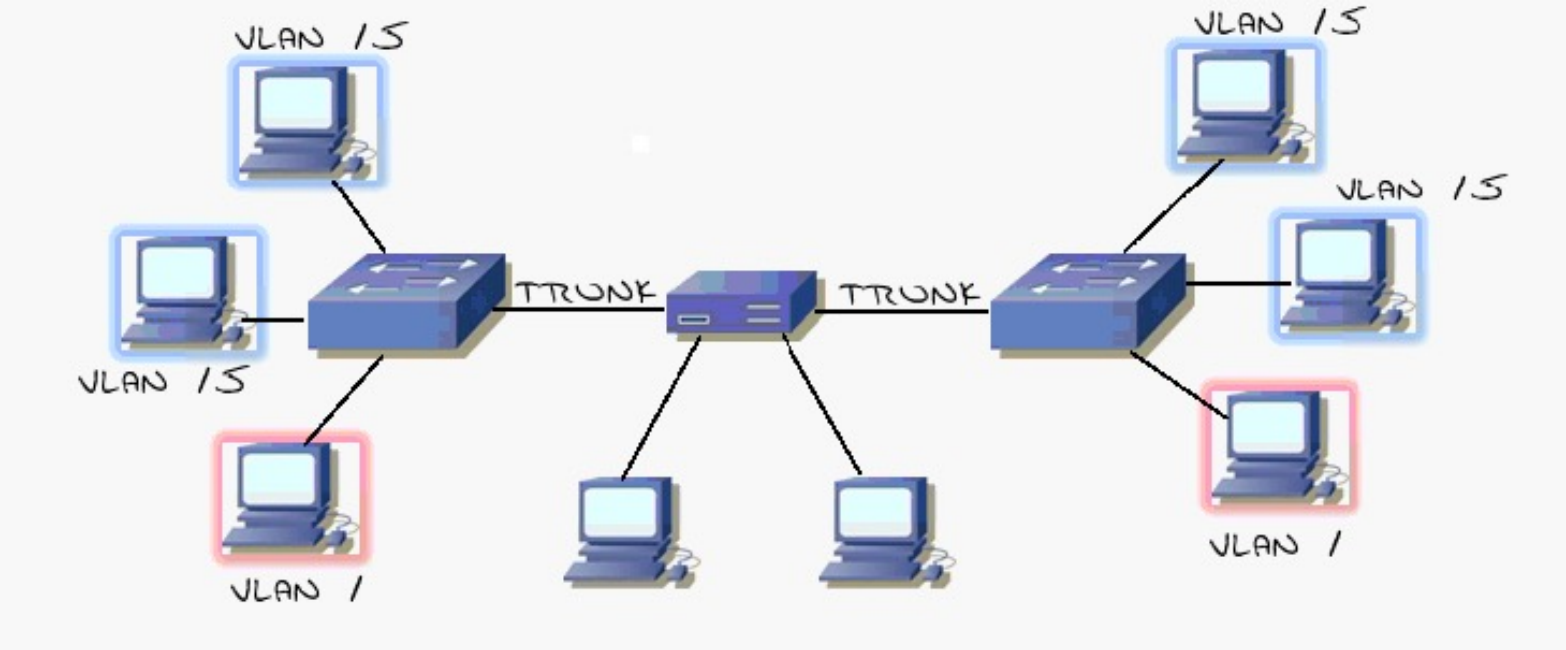
VLAN Trunking



- VLAN Tagging is used when a single link needs to carry traffic for more than one VLAN.

WHAT IS NATIVE VLAN?

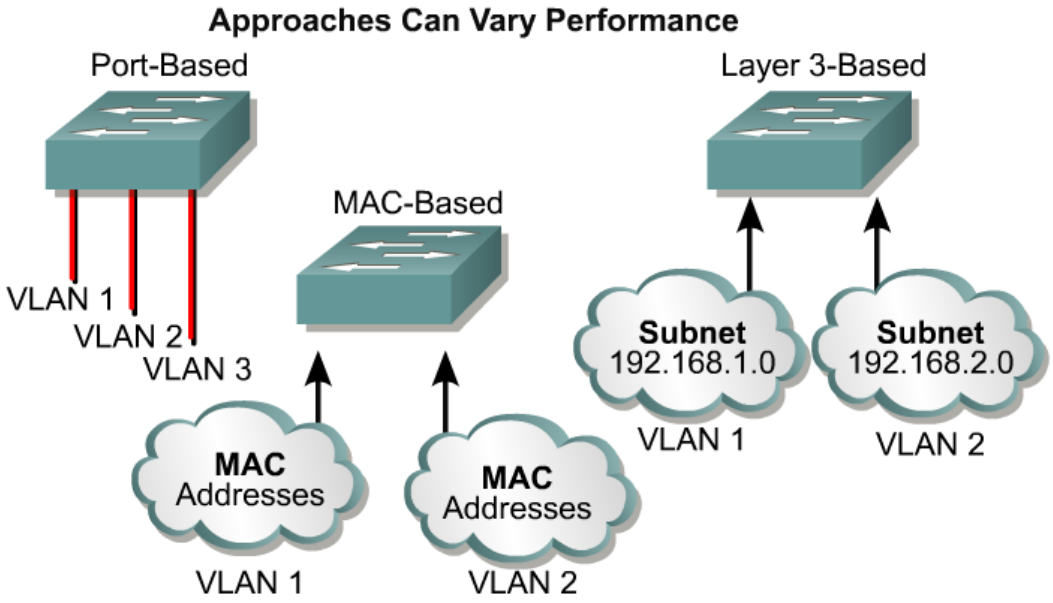
- Native Vlan is design for packets, send and receive on trunk that are not tagged.



How the Native Vlan use?

- This modern IP phones can tag its packets.
- That make the switch port, allow to ip phone configure as trunk port
- PC can't tag packet normally. Send and receive untagged packet.
- Set the trunk port native vlan to 10.
- This separate the voice traffic and data traffic in different vlan

VLAN Types



VLAN Types	Description
Port-based	• Most common configuration method. • Ports assigned individually, in groups, in rows, or across 2 or more switches. • Simple to use. • Often implemented where Dynamic Host Control Protocol (DHCP) is used to assign IP addresses to network hosts.
MAC address	• Rarely implemented today. • Each address must be entered into the switch and configured individually. • Users find it useful. • Difficult to administer, troubleshoot and manage.
Protocol Based	• Configured like MAC addresses, but instead uses a logical or IP address. • No longer common because of DHCP.

VLAN CONFIGURATION

Configuring VLANs	Description
Statically	Network administrators configure port-by-port. Each Port is associated with a specific VLAN. The network administrator is responsible for keying in the mappings between the ports and VLANs.
Dynamically	The ports are able to dynamically work out their VLAN configuration. Uses a software database of MAC address to VLAN mappings (which the network administrator must set up first).