VLAN

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Typical network, no internet

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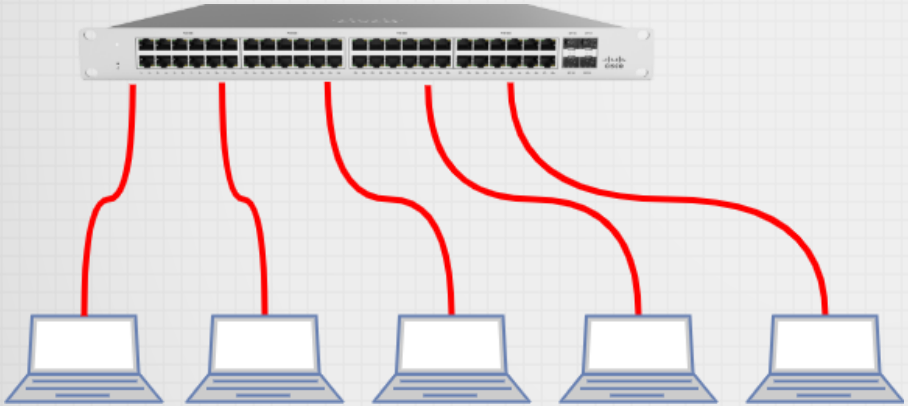
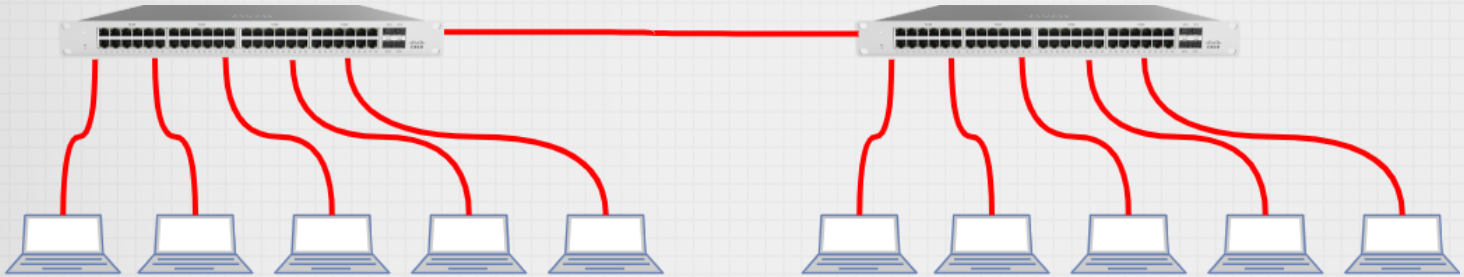
- All computers just connect to one switch (concentrator)
- One network segment, one broadcast domain.



Site A

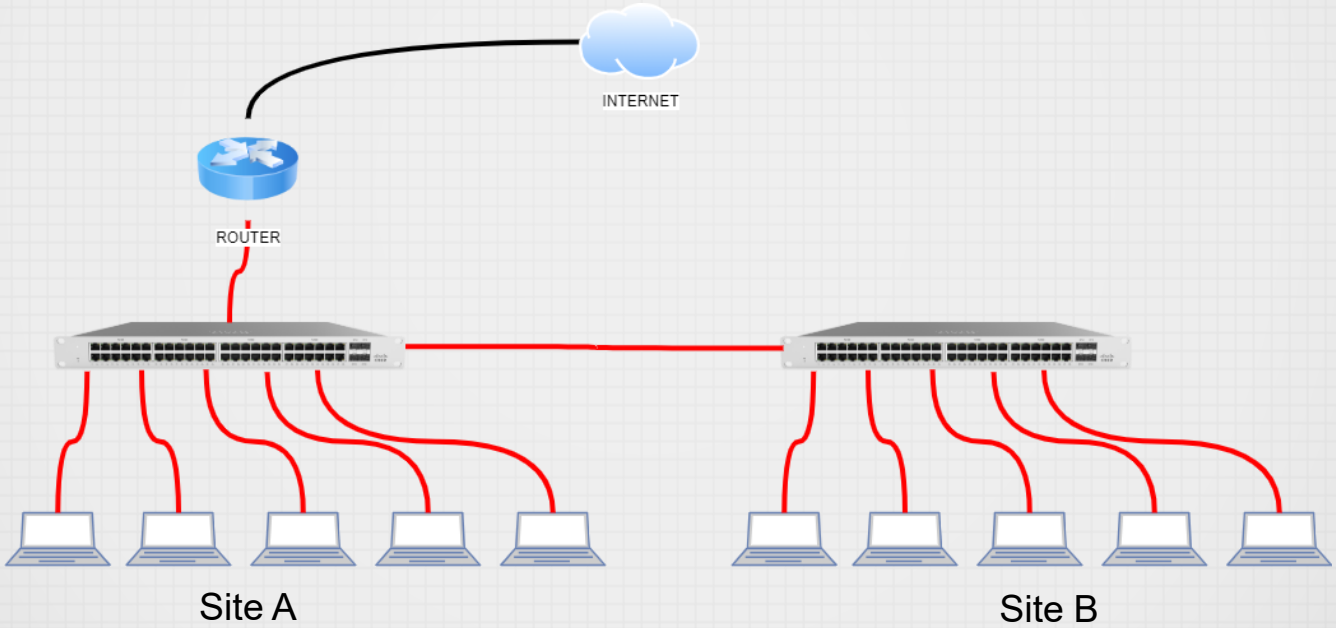
Typical network, more switches, no internet

- Network segment is extended
- Still one network segment, single broadcast domain



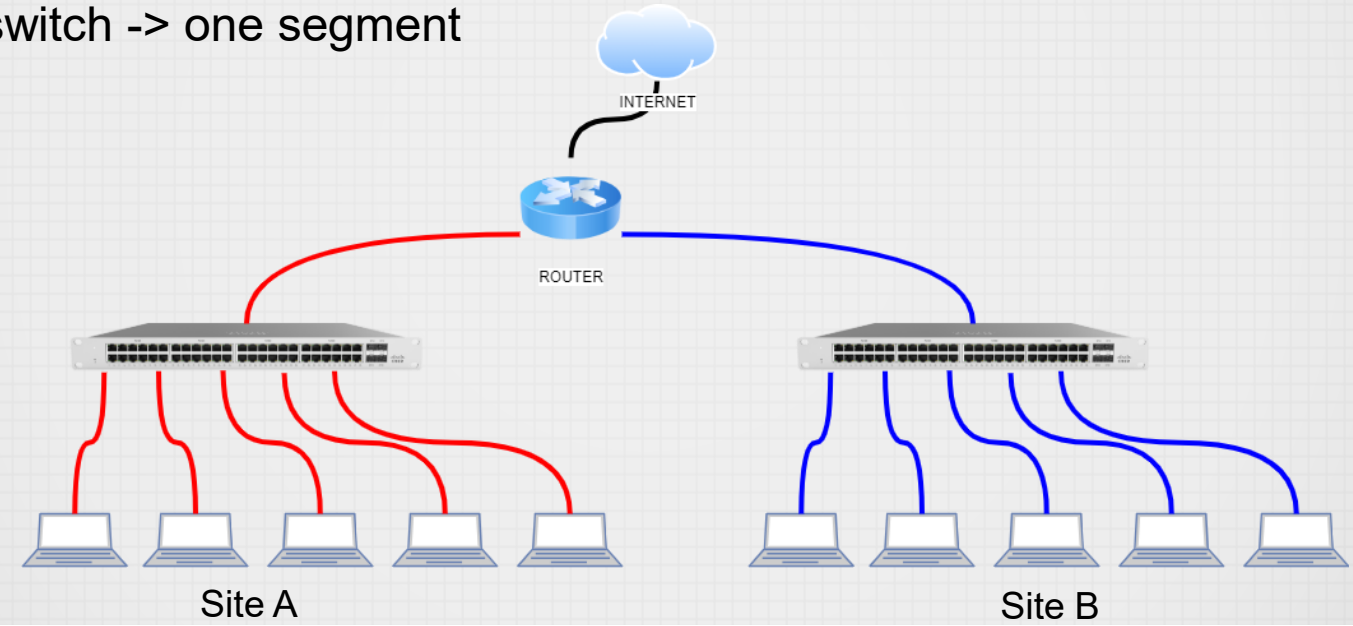
Typical network, with internet

- add a router to connect to other network (internet is a collection of networks)



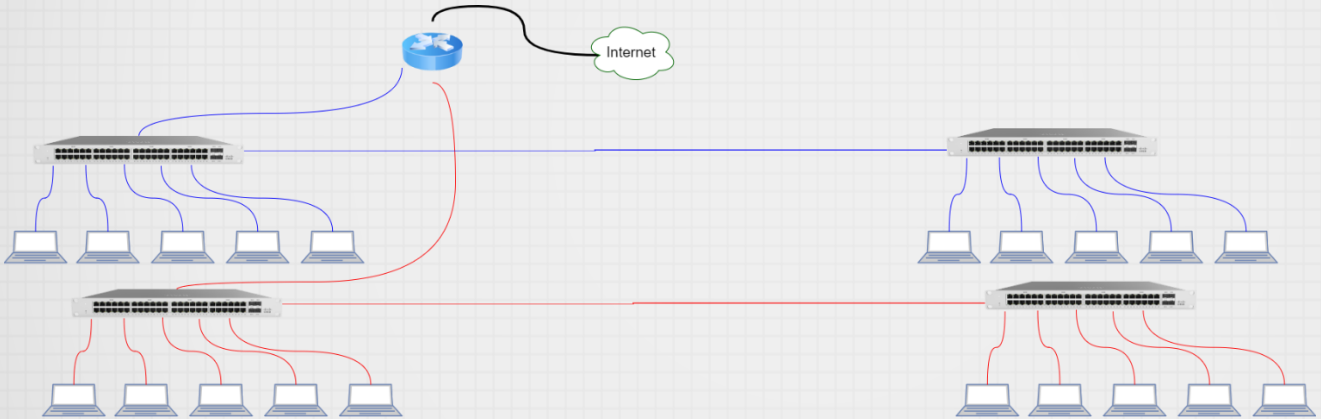
Typical network, with internet and segmentation

- A router is used to divide network based on layer 3 (network) -> different ip address segment
- One switch -> one segment



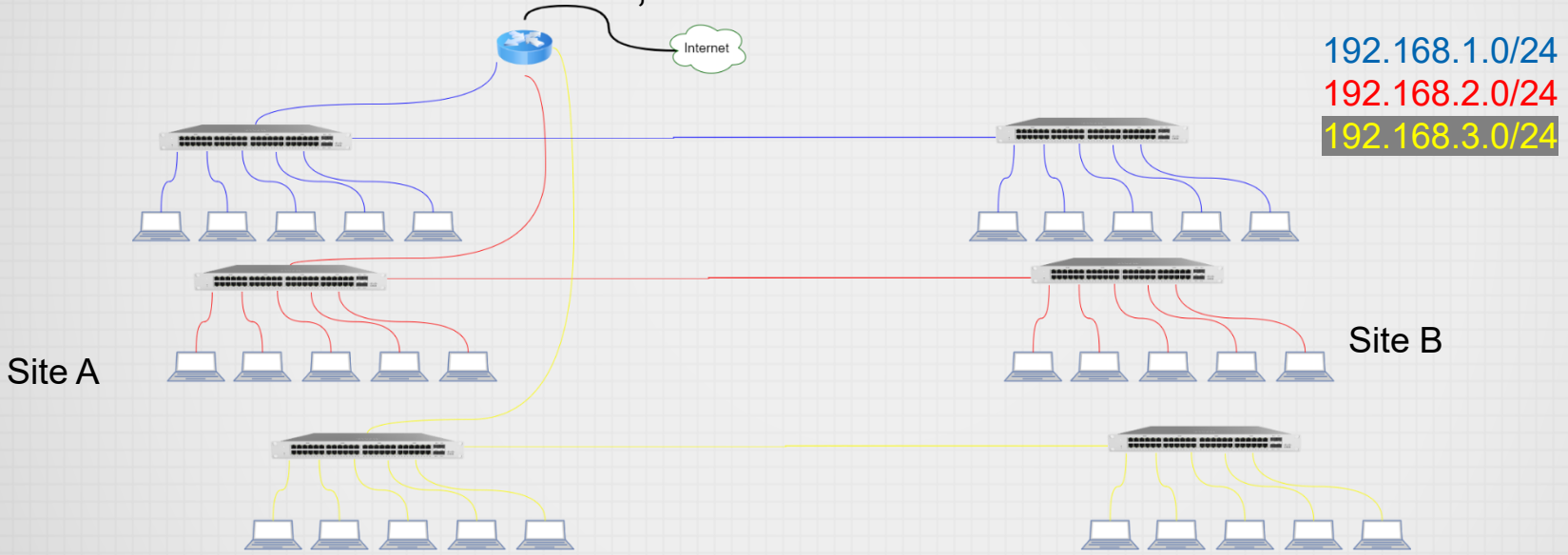
Multiple Segment in one Site

- One switch -> one segment
- You need more switches



More Segment in one Site

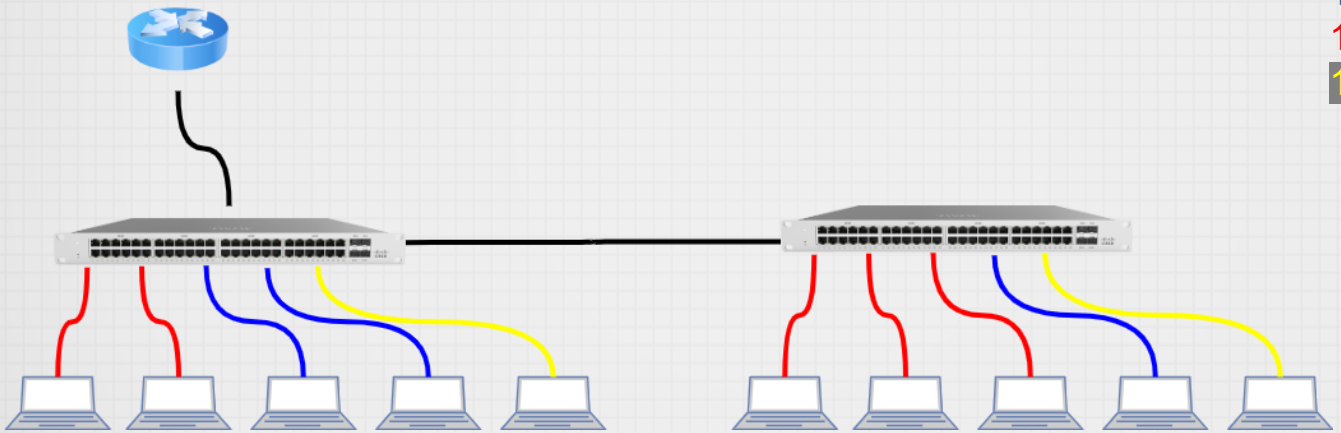
- One switch -> one segment
- You need more switches, more investment



What VLAN can do

- **One switch multiple segment,** divide the switch based on ports
- less equipment, save money, save space
- **Requires** more **knowledge**

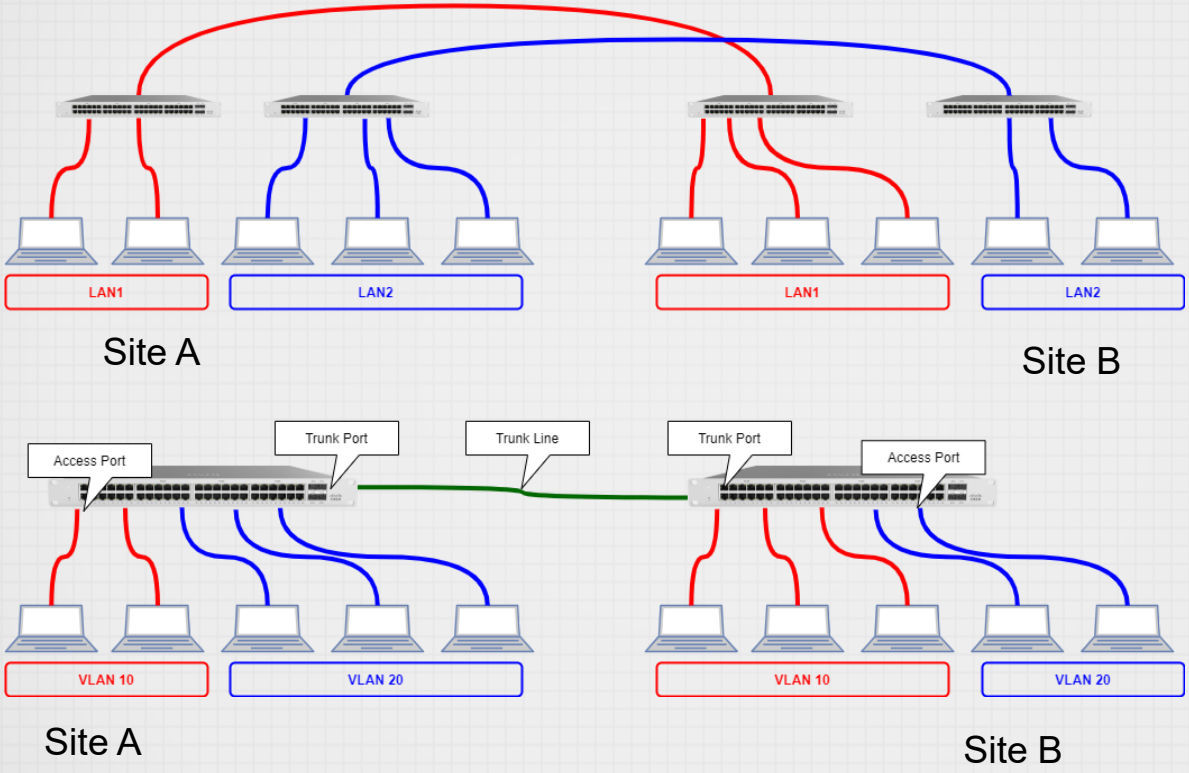
192.168.1.0/24
192.168.2.0/24
192.168.3.0/24



Site A

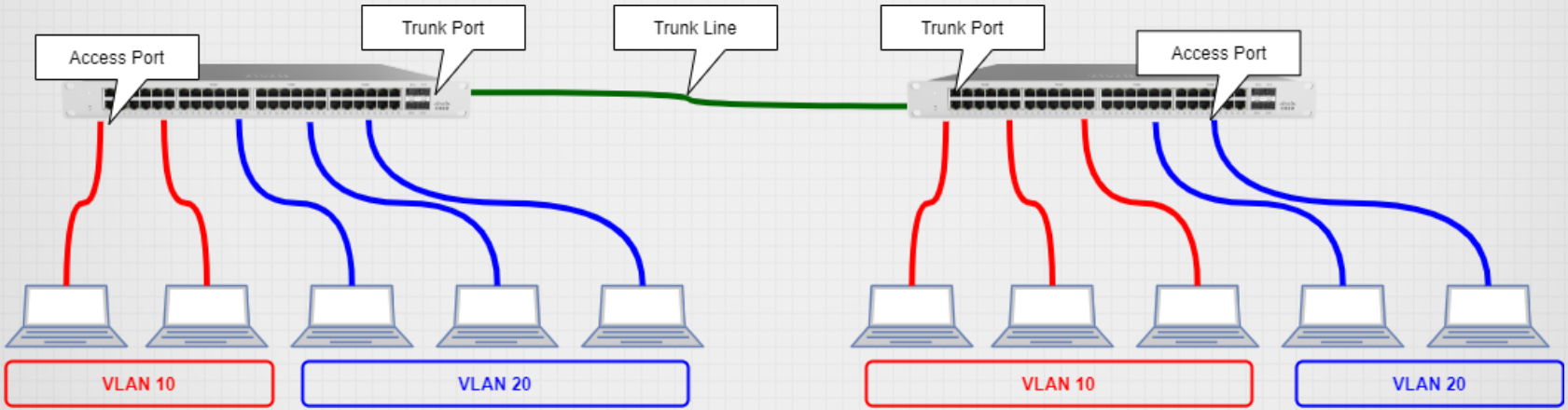
Site B

Without and with VLAN



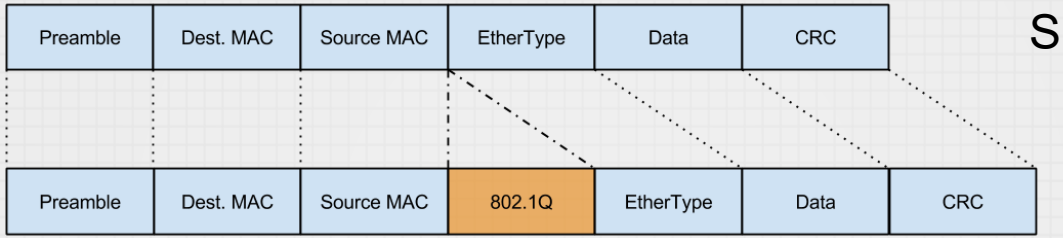
VLAN Terms

- **VLAN**: a feature on layer 2 device (switch) to do virtual segmentation on physical switch
- The segmentation can be extended to other switch using “trunk” link.
- Port types:
  - ✓ Access port -> to connect to end-devices
  - ✓ Trunk port -> to connect to other VLAN switch



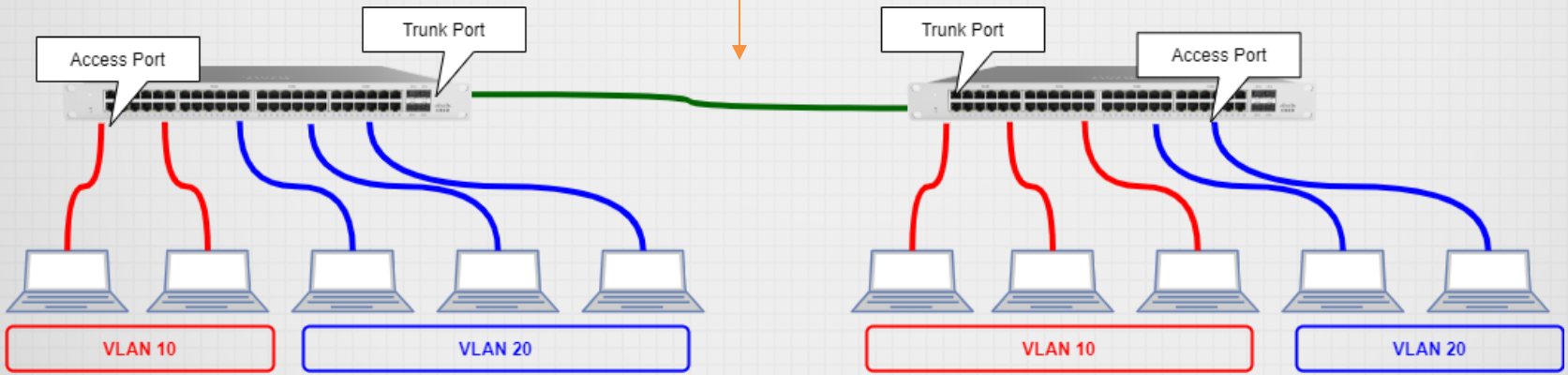
Whats happening in Trunk

- The layer-2-header of outgoing frame will be modified by adding VLAN tag on the header
- This tag will be recognized at the other end



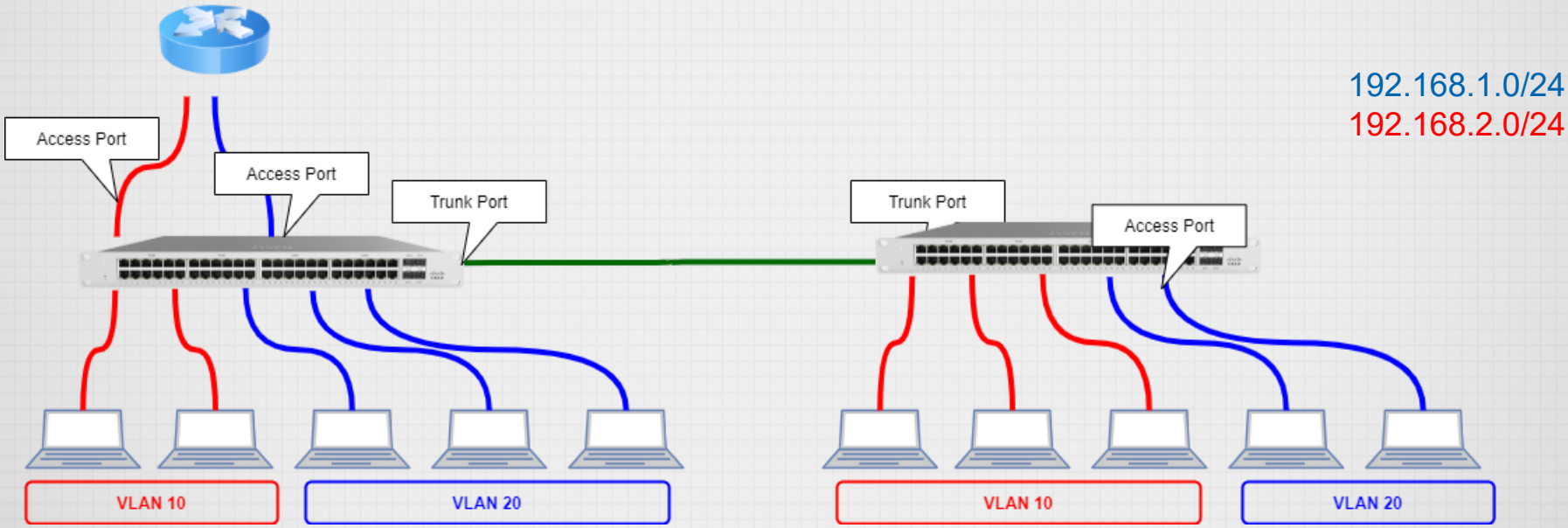
Size =1500 byte

Size =1504 byte

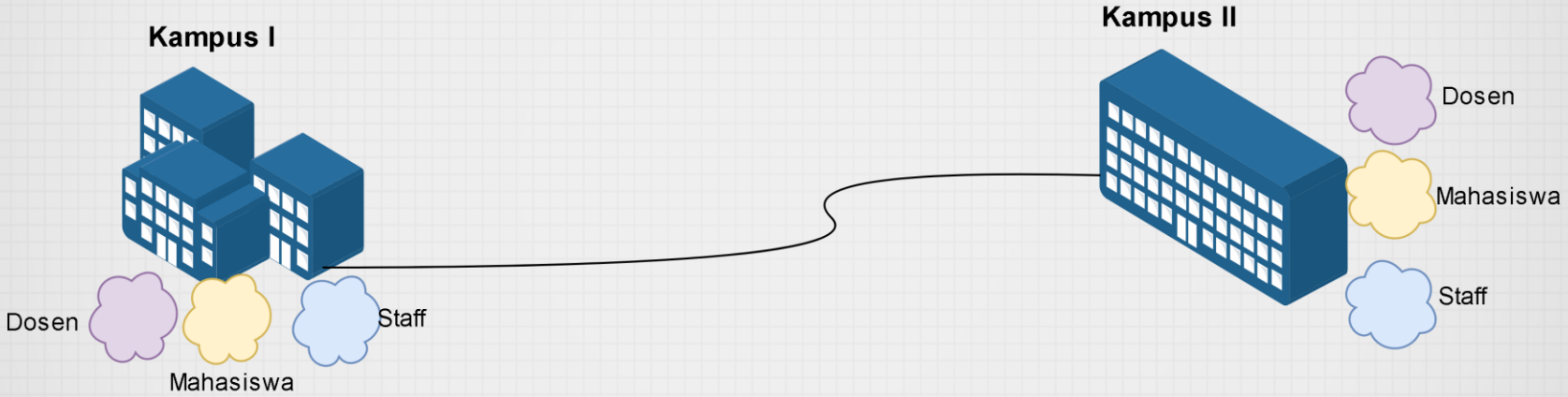


Inter-VLAN communication

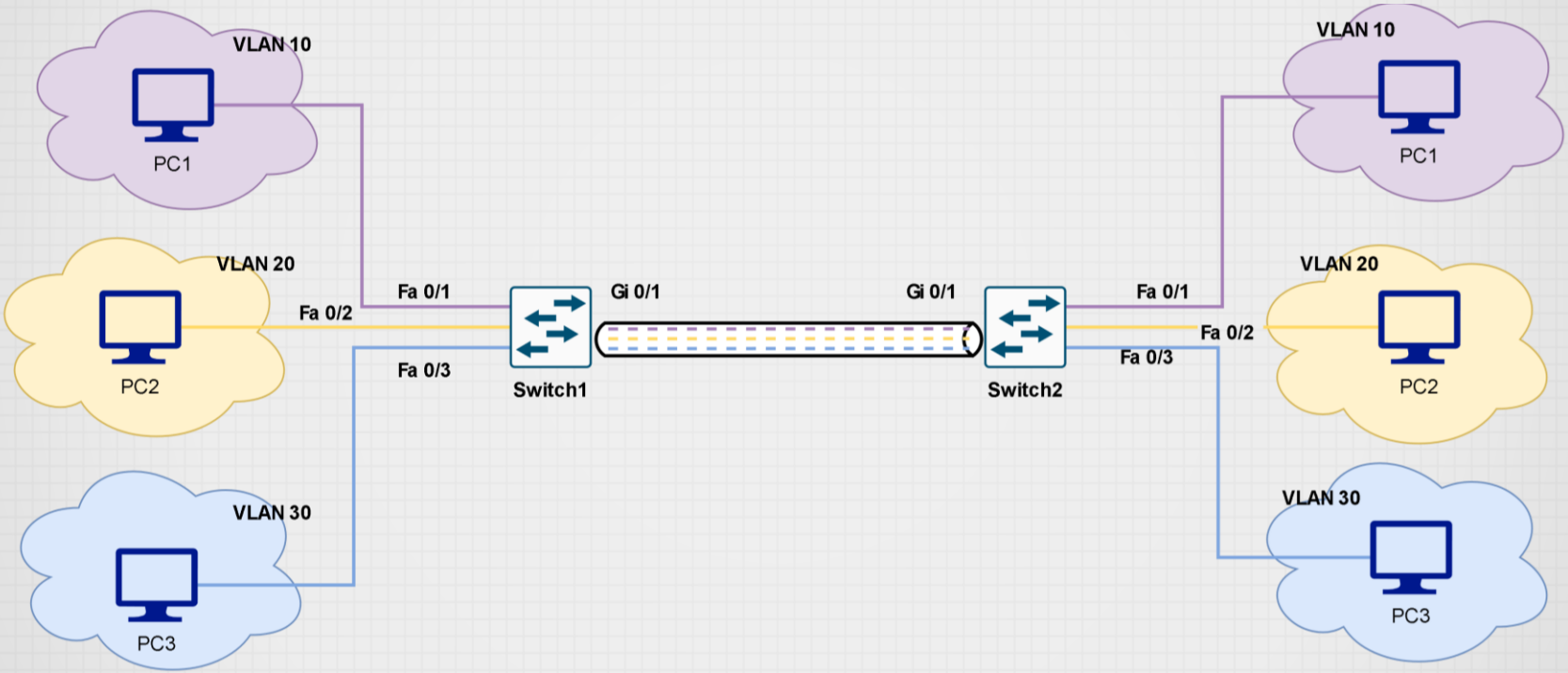
- One VLAN = 1 network segment = 1 network ID = 1 broadcast domain
- Meaning: we need a router to route packets between VLAN
- IP address on router's interfaces will become the gateway of each VLAN



PHYSICAL TOPOLOGY



LOGICAL TOPOLOGY



LAB

Menambahkan vlan database dalam switch

```
Switch(config)#vlan 10
Switch(config-vlan)#name dosen
Switch(config)#vlan 20
Switch(config-vlan)#name mahasiswa
Switch(config)#vlan 30
Switch(config-vlan)#name staff tendik
```

LAB

Config trunk port (Gi 0/1)

```
Switch(config)#interface GigabitEthernet0/1
Switch(config-if)#switchport mode trunk
Switch(config-if)#switchport trunk allowed vlan 10,20,30
```

LAB

Membuat akses port untuk vlan yang telah dibuat

```
Switch(config)#interface FastEthernet0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
```

```
Switch(config)#interface FastEthernet0/2
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
```

```
Switch(config)#interface FastEthernet0/3
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
```