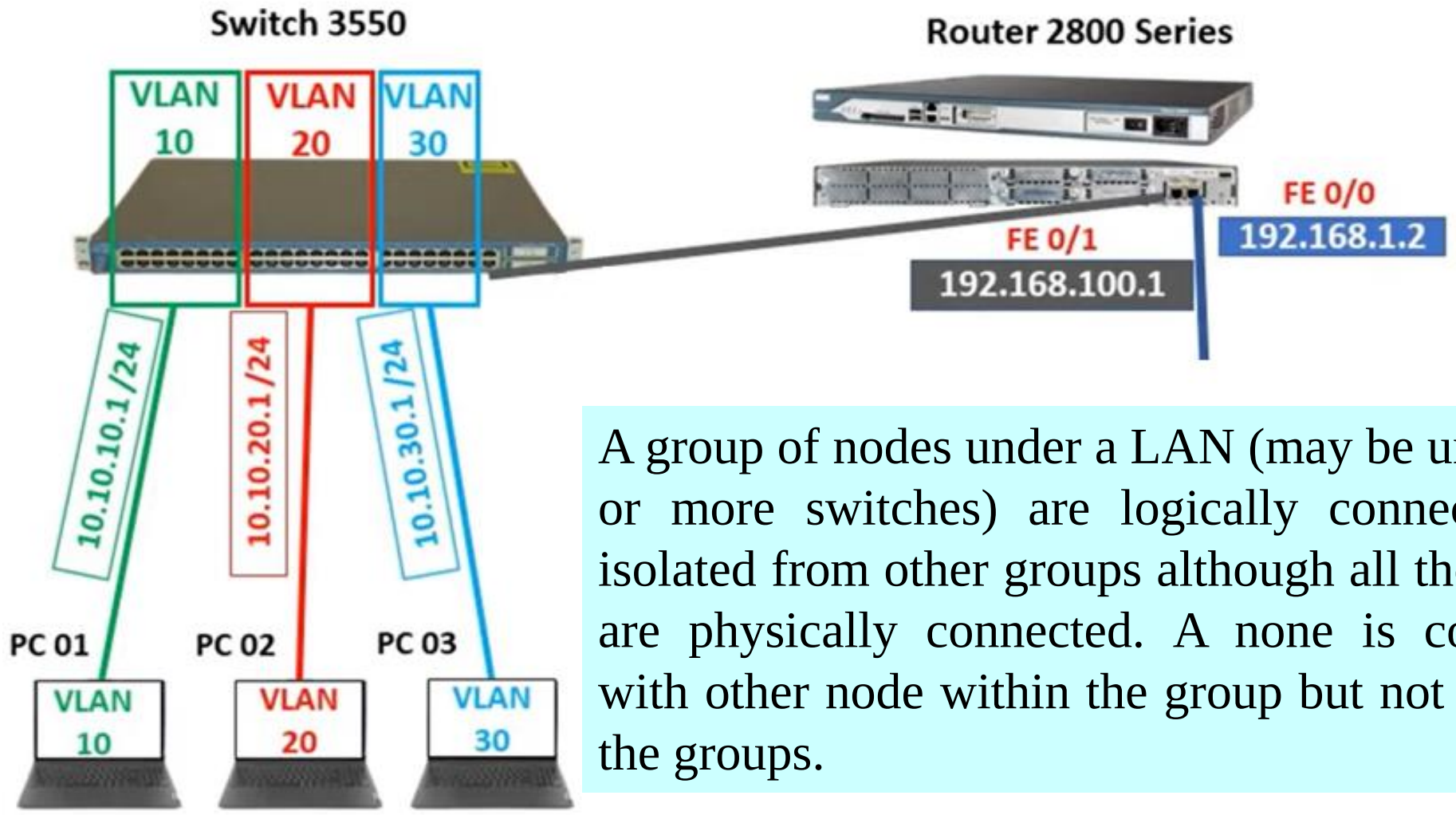
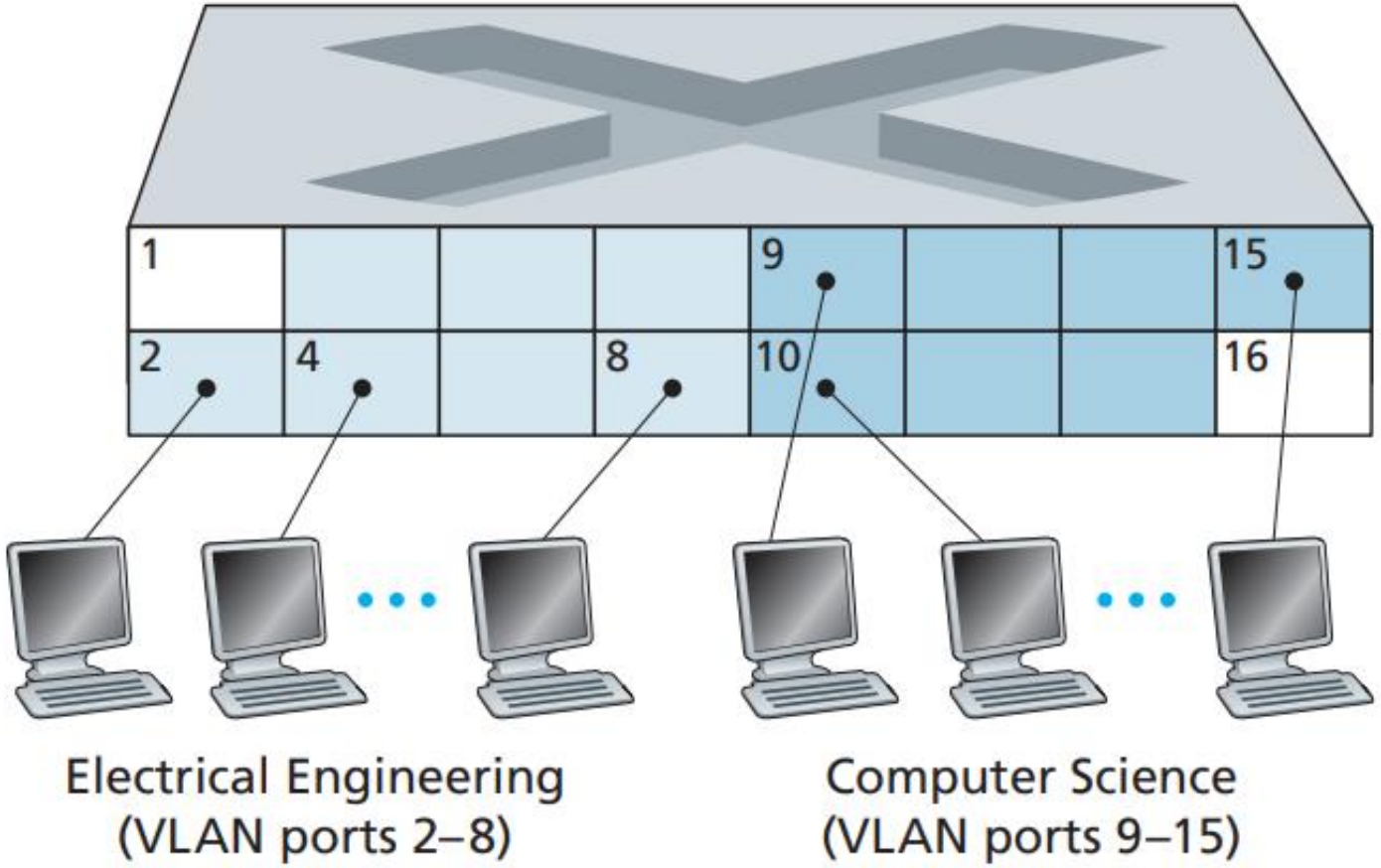
VLAN Configuration with Switch and Router

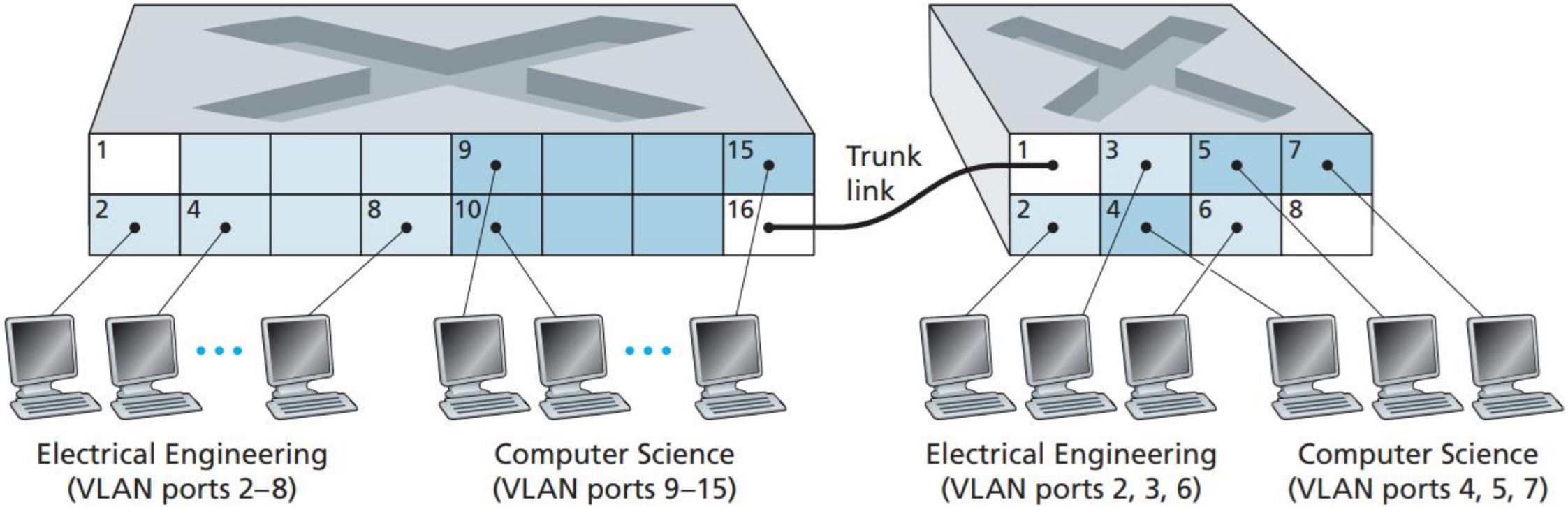


A group of nodes under a LAN (may be under one or more switches) are logically connected but isolated from other groups although all the groups are physically connected. A none is connected with other node within the group but not between the groups.



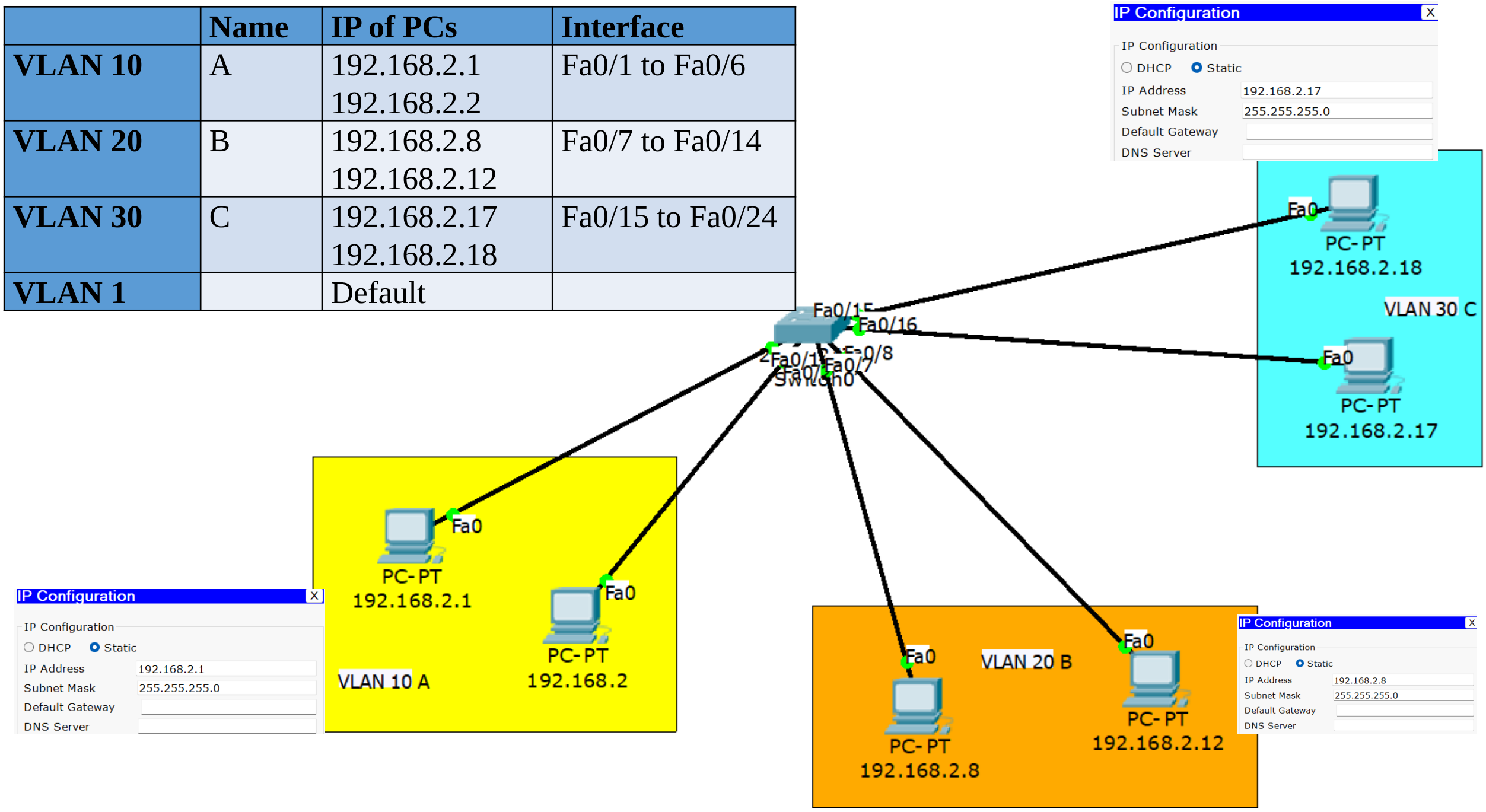
A single switch with two configured VLANs

We can roughly define a virtual local area network (VLAN) as a local area network configured by software, not by physical wiring.



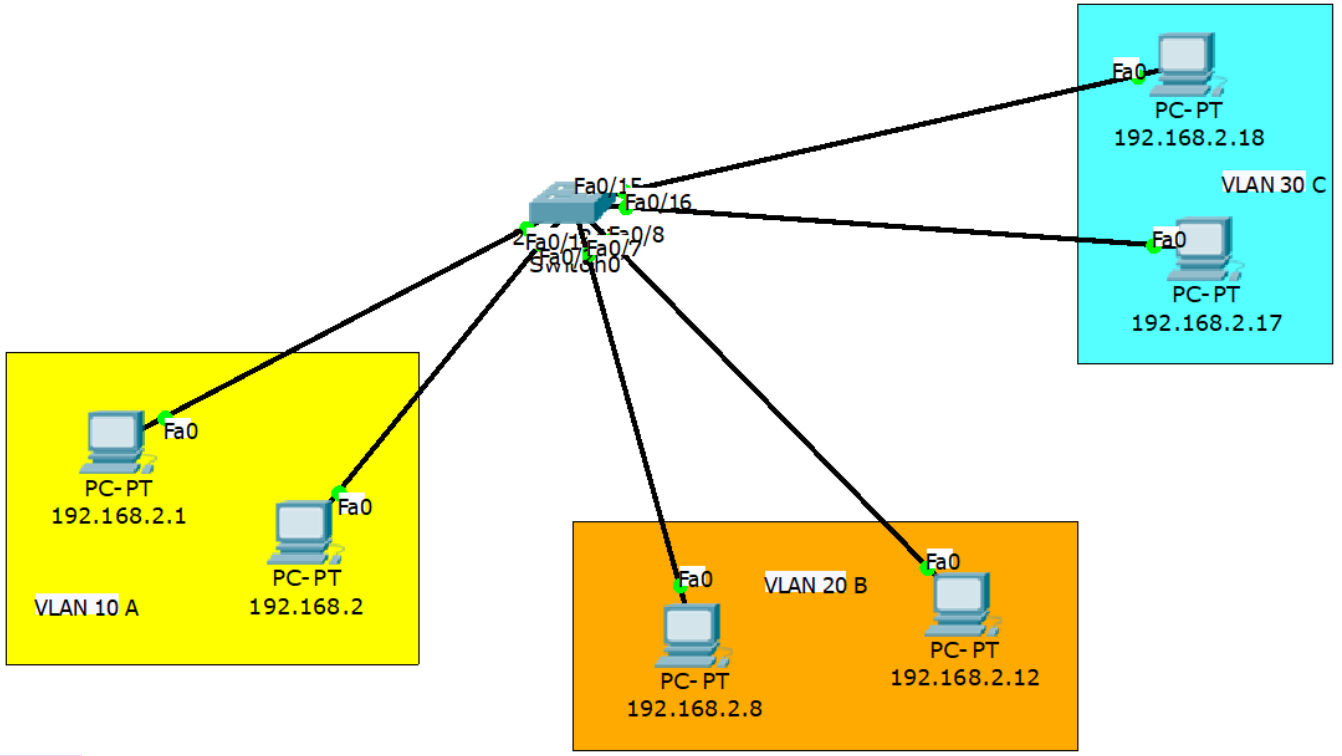
Connecting two VLAN switches with trunk line

	Name	IP of PCs	Interface
VLAN 10	A	192.168.2.1 192.168.2.2	Fa0/1 to Fa0/6
VLAN 20	B	192.168.2.8 192.168.2.12	Fa0/7 to Fa0/14
VLAN 30	C	192.168.2.17 192.168.2.18	Fa0/15 to Fa0/24
VLAN 1		Default	



```
Switch>en
Switch#conf t
Switch(config)#vlan 10
Switch(config-vlan)#name A
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name B
Switch(config-vlan)#exit
Switch(config)#vlan 30
Switch(config-vlan)#name C
Switch(config-vlan)#exit
Switch(config)#int range fa0/1-6
Switch(config-if-range)#switchport access vlan 10
Switch(config-if-range)#exit
Switch(config)#int range fa0/7-14
Switch(config-if-range)#switchport access vlan 20
Switch(config-if-range)#exit
Switch(config)#int range fa0/15-24
Switch(config-if-range)#switchport access vlan 30
Switch(config-if-range)#end
Switch#sh vlan brief
```

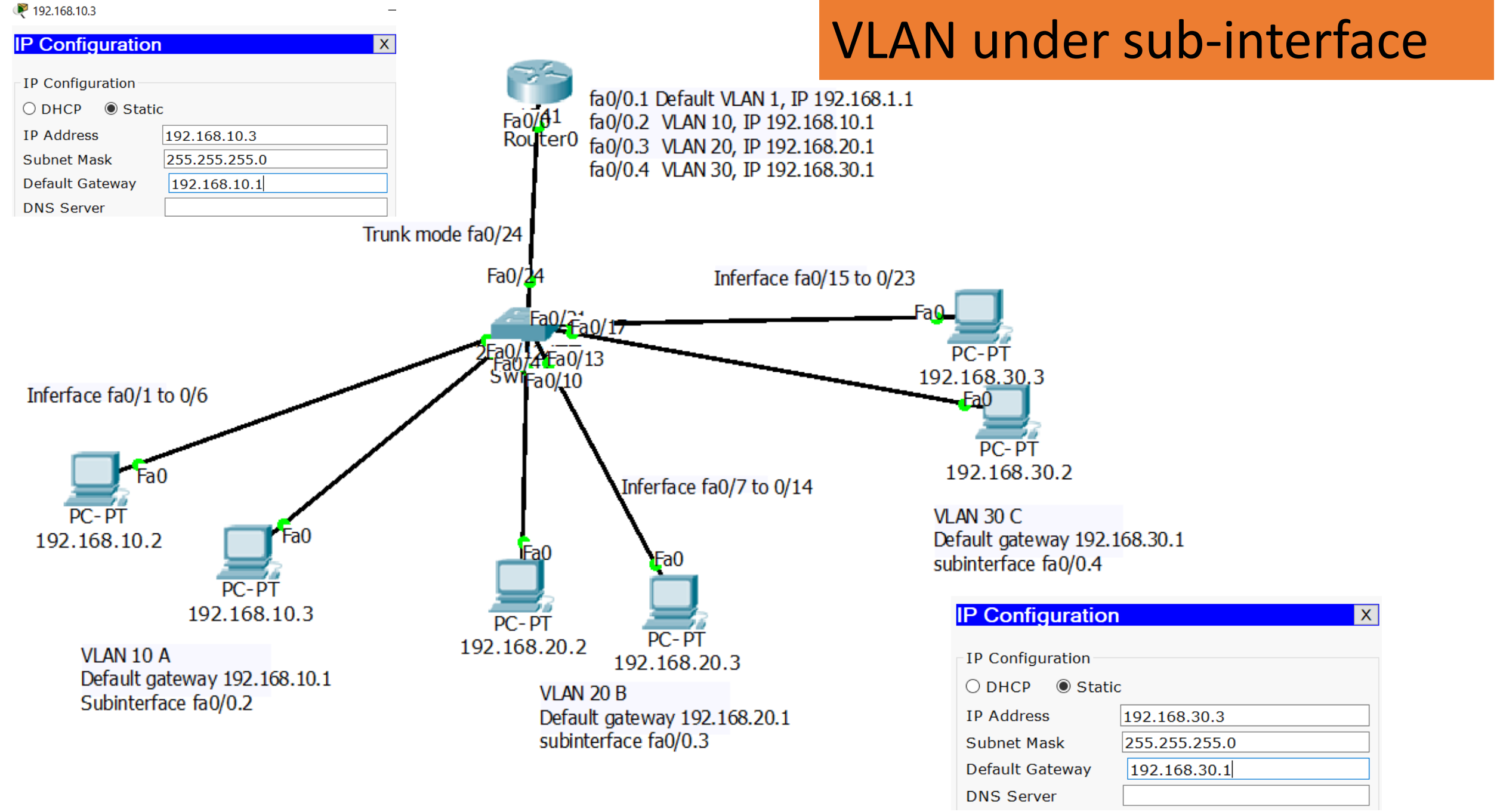
	Name	IP of PCs	Interface
VLAN 10	A	192.168.2.1 192.168.2.2	Fa0/1 to Fa0/6
VLAN 20	B	192.168.2.8 192.168.2.12	Fa0/7 to Fa0/14
NLAN 30	C	192.168.2.17 192.168.2.18	Fa0/15 to Fa0/24

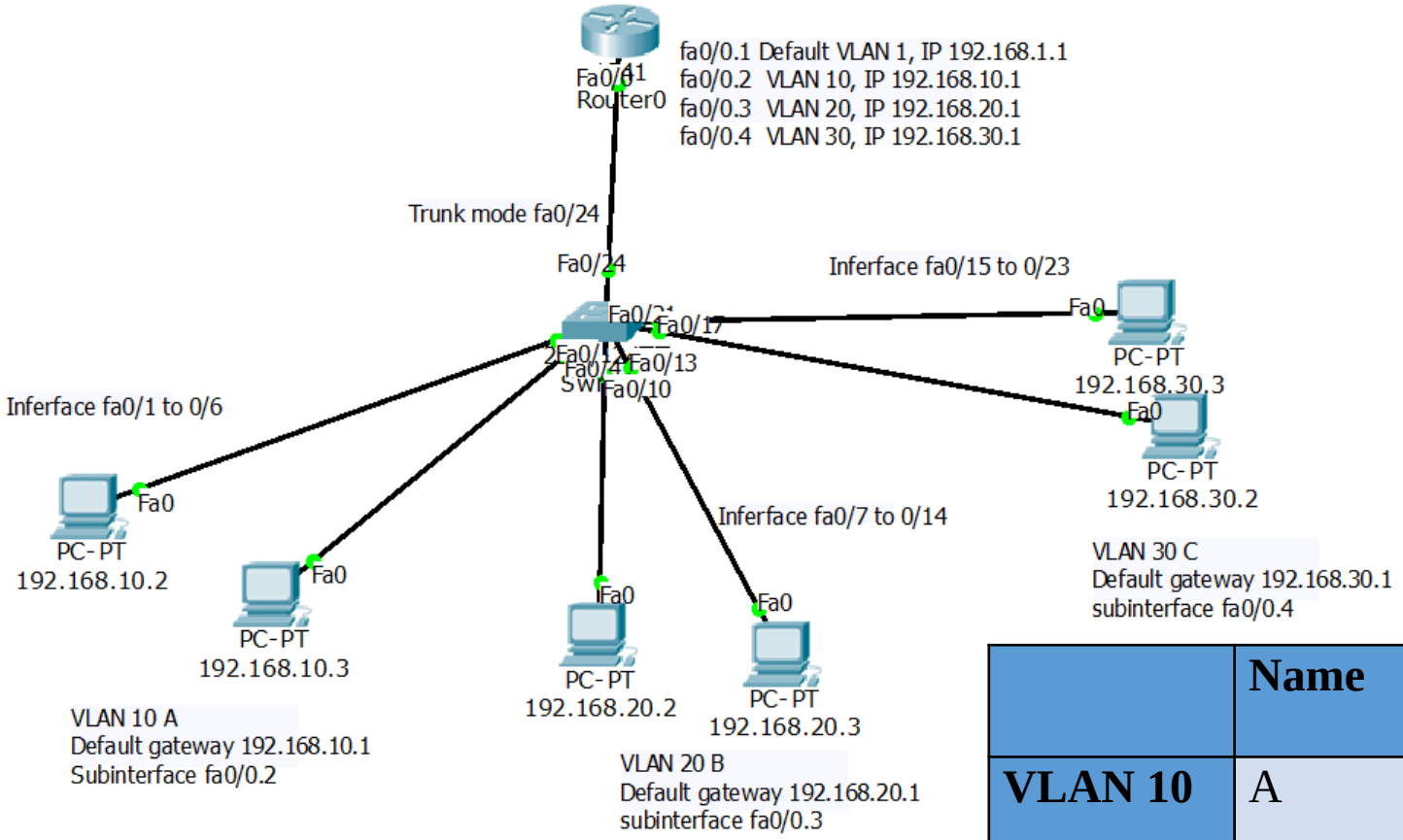


```
Switch#sh vlan brief
VLAN Name                             Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                          active    Gig1/1, Gig1/2
10   A                                active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                                Fa0/5, Fa0/6
20   B                                active    Fa0/7, Fa0/8, Fa0/9, Fa0/10
                                                Fa0/11, Fa0/12, Fa0/13, Fa0/14
30   C                                active    Fa0/15, Fa0/16, Fa0/17, Fa0/18
                                                Fa0/19, Fa0/20, Fa0/21, Fa0/22
                                                Fa0/23, Fa0/24
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
Switch#
```

Now verify using ping and ICMP

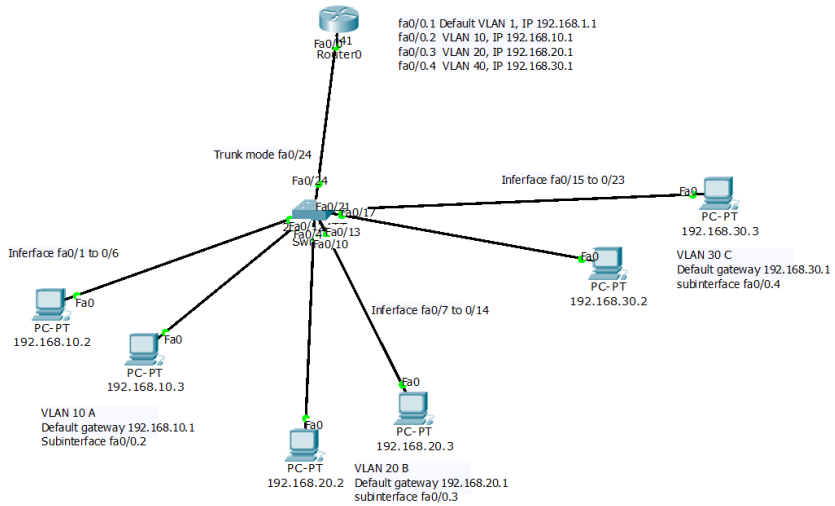
VLAN under sub-interface





	Name	IP of PCs	Default Gateway	Interface
VLAN 10	A	192.168.10.2 192.168.10.3	192.168.10.1 Sub interface fa0/0.2	Fa0/1 to Fa0/6
VLAN 20	B	192.168.20.2 192.168.20.3	192.168.20.1 Sub interface fa0/0.3	Fa0/7 to Fa0/14
VLAN 30	C	192.168.30.2 192.168.30.3	192.168.30.1 Sub interface fa0/0.4	Fa0/15 to Fa0/23
VLAN 1	Default VLAN Router itself		192.168.1.1 Sub interface fa0/0.1	The interface of the router Fa0/0

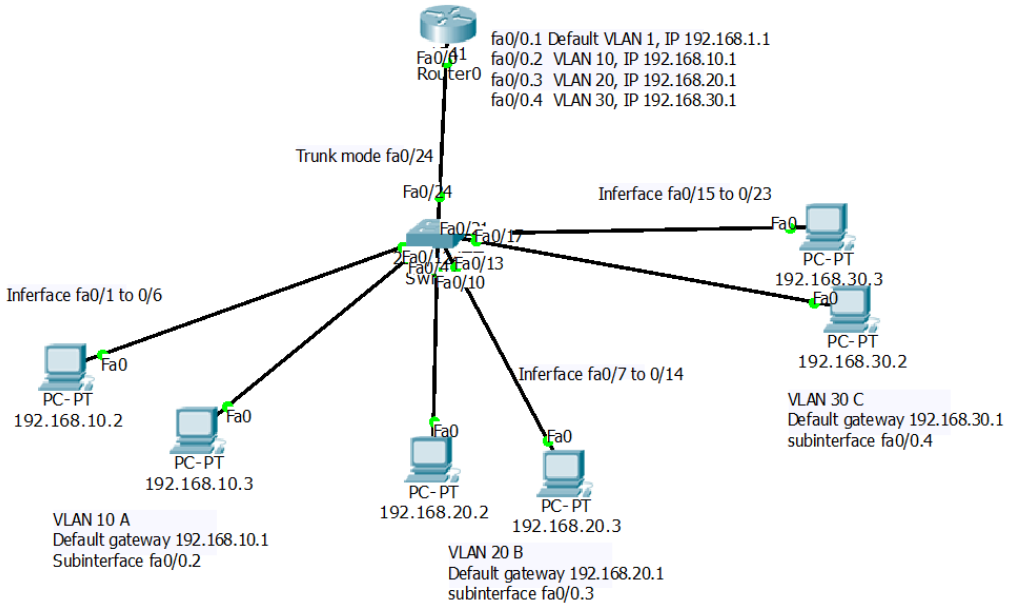
```
Switch>en
Switch#conf t
Switch(config)#vlan 10
Switch(config-vlan)#name A
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name B
Switch(config-vlan)#exit
```




```
Switch(config)#vlan 30
Switch(config-vlan)#name C
Switch(config-vlan)#exit
Switch(config)#int range fa0/1-6
Switch(config-if-range)#switchport access vlan 10
Switch(config-if-range)#exit
Switch(config)#int range fa0/7-14
Switch(config-if-range)#switchport access vlan 20
Switch(config-if-range)#exit
Switch(config)#int range fa0/15-23
Switch(config-if-range)#switchport access vlan 30
Switch(config-if-range)#exit
Switch(config)#int fa0/24
Switch(config-if)#switchport mode trunk
Switch(config-if)#end
```

VLAN	Name	Status	Ports
1	default	active	Fa0/24, Gig1/1, Gig1/2
10	A	active	Fa0/1, Fa0/2, Fa0/3, Fa0/4, Fa0/5, Fa0/6
20	B	active	Fa0/7, Fa0/8, Fa0/9, Fa0/10 ,Fa0/11, Fa0/12, Fa0/13, fa0/14
30	C	active	Fa0/15, Fa0/16, Fa0/17, Fa0/18, Fa0/19, Fa0/20, Fa0/21, Fa0/22, Fa0/23
1002	fddi-default	active	
1003	token-ring-default	active	
1004	fddinet-default	active	
1005	trnet-default	active	

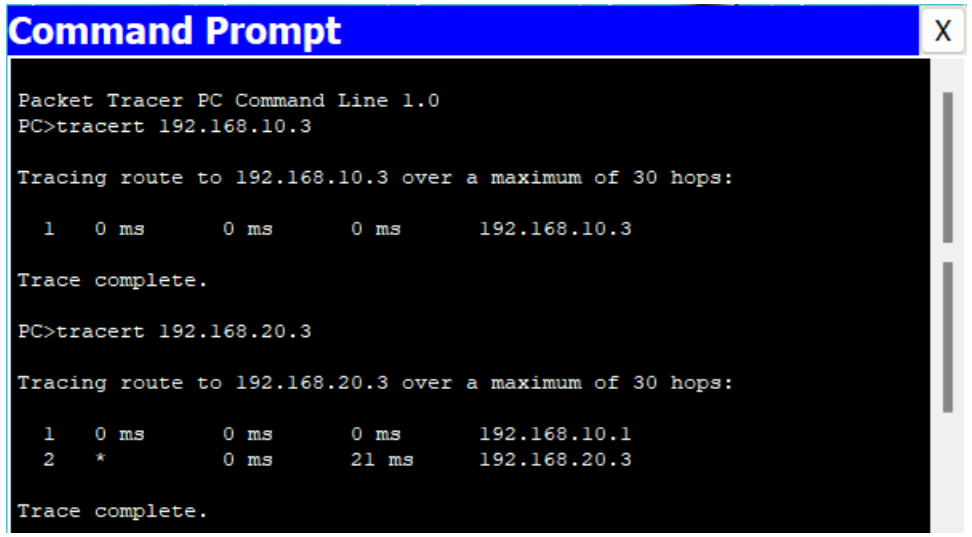
```
Router>en
Router#conf t
Router(config)#int fa0/0
Router(config-if)#no shut
Router(config-if)#int fa0/0.1
Router(config-subif)#encapsulation dot1q 1
Router(config-subif)#ip add 192.168.1.1 255.255.255.0
Router(config-subif)#int fa0/0.2
Router(config-subif)#encapsulation dot1q 10
Router(config-subif)#ip add 192.168.10.1 255.255.255.0
Router(config-subif)#int fa0/0.3
Router(config-subif)#encapsulation dot1q 20
Router(config-subif)#ip add 192.168.20.1 255.255.255.0
Router(config-subif)#int fa0/0.4
Router(config-subif)#encapsulation dot1q 30
Router(config-subif)#ip add 192.168.30.1 255.255.255.0
Router(config-subif)#end
```



```
Router#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    192.168.1.0/24 is directly connected, FastEthernet0/0.1
C    192.168.10.0/24 is directly connected, FastEthernet0/0.2
C    192.168.20.0/24 is directly connected, FastEthernet0/0.3
C    192.168.30.0/24 is directly connected, FastEthernet0/0.4
```



Verify the network using tracert, ping and ICMP