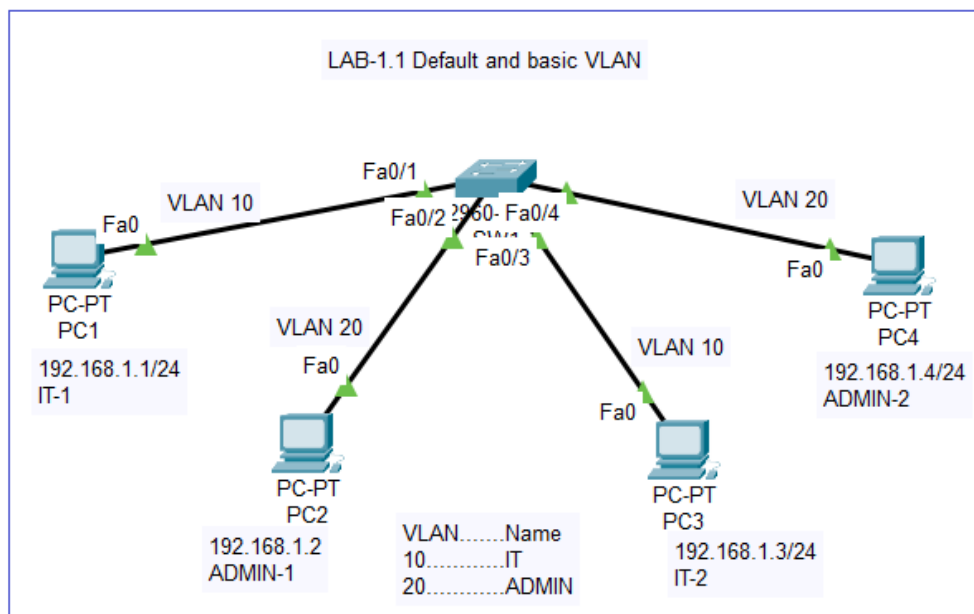VLAN:

A virtual LAN (VLAN) is any broadcast domain that is partitioned and isolated in a computer network at the data link layer (OSI layer 2).

LAN is the abbreviation for "Local Area Network" and in this context virtual refers to a physical object recreated and altered by additional logic.

VLANs work by applying tags to network frames and handling these tags in networking systems – creating the appearance and functionality of network traffic that is physically on a single network but acts as if it is split between separate networks.

In this way, VLANs can keep network applications separate despite being connected to the same physical network, and without requiring multiple sets of cabling and networking devices to be deployed.

LAB-01. Default and basic VLAN:

Step1: Check default vlan at switch:
SW1#show vlan brief

```
VLAN Name                         Status    Ports
---- -------------------------------- --------- -------------------------------
1    default                      active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                            Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                            Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                            Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                            Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                            Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                            Gig0/1, Gig0/2
1002 fddi-default                 active
1003 token-ring-default             active
1004 fddinet-default               active
1005 trnet-default                active
```
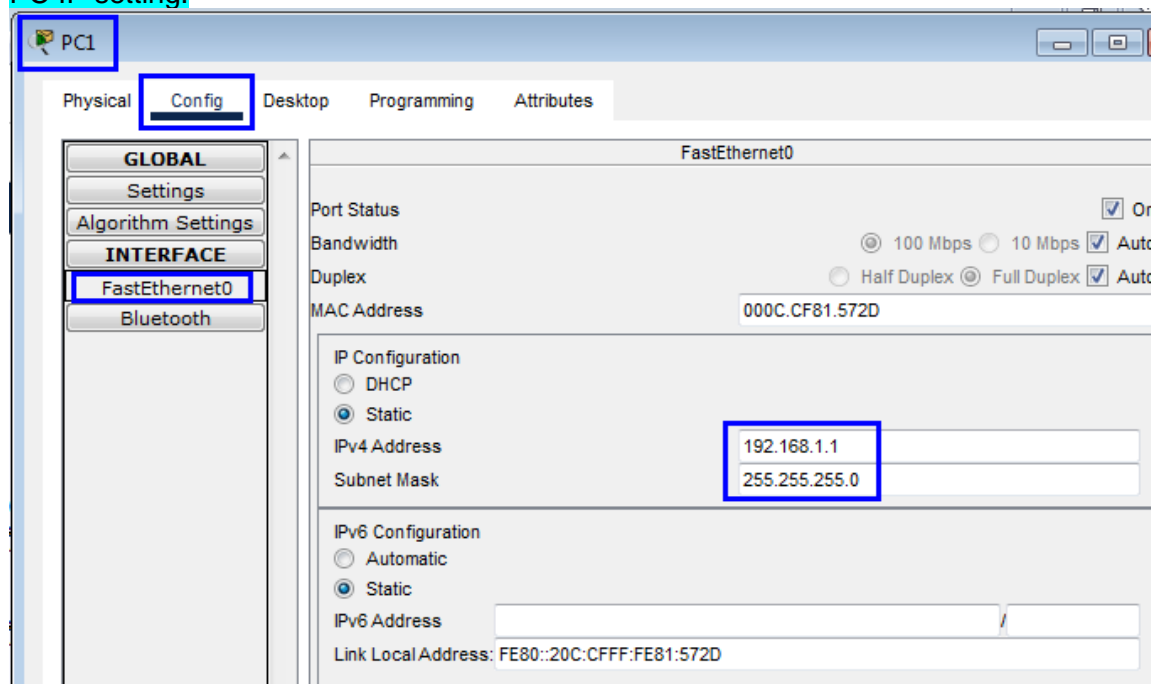
Step2: Set IP and Subnet mask to all PC ping test each other:
PC1: 192.168.1.1, Subnet mask: 255.255.255.0
PC1: 192.168.1.2, Subnet mask: 255.255.255.0
PC3: 192.168.1.3, Subnet mask: 255.255.255.0
PC4: 192.168.1.4, Subnet mask: 255.255.255.0

PC IP setting:

Step3: Ping test from PC1 to PC2, PC3, PC4:
PC1>ping 192.168.1.2
Pinging 192.168.1.2 with 32 bytes of data:
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128

PC1>ping 192.168.1.3
Pinging 192.168.1.3 with 32 bytes of data:
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128

PC1>ping 192.168.1.4
Pinging 192.168.1.4 with 32 bytes of data:
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128
Reply from 192.168.1.4: bytes=32 time<1ms TTL=128

Note: Here PC1 can ping to all PC due to all PC are under default vlan1.

Step4: VLAN creating into switch:
SW1>enable
SW1#configure terminal

```
SW1(config)#vlan ?
 <1-4094>  ISL VLAN IDs 1-1005

SW1(config)#vlan 10
SW1(config-vlan)#name IT
SW1(config-vlan)#exit
SW1(config)#vlan 20
SW1(config-vlan)#name ADMIN
SW1(config-vlan)#exit
SW1(config)#exit

SW1#show vlan brief
VLAN Name                      Status    Ports
---- ------------------------- --------- -------------------------------
1    default                   active    Fa0/1, Fa0/2, Fa0/3, Fa0/4
                                         Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                         Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                         Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                         Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                         Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                         Gig0/1, Gig0/2
10   IT                        active
20   ADMIN                     active
1002 fddi-default              active
1003 token-ring-default        active
1004 fddinet-default           active
1005 trnet-default             active
```

Step5: VLAN assign to interface into switch:
```
SW1#configure terminal
SW1(config)#interface fastEthernet 0/1
SW1(config-if)#switchport mode access
SW1(config-if)#switchport access vlan 10
SW1(config-if)#exit

SW1(config)#interface fastEthernet 0/3
SW1(config-if)#switchport mode access
SW1(config-if)#switchport access vlan 10
SW1(config-if)#exit

SW1(config)#interface range fastEthernet 0/2, fastEthernet 0/4
SW1(config-if-range)#switchport mode access
SW1(config-if-range)#switchport access vlan 20
SW1(config-if-range)#exit
SW1(config)#exit
SW1#show vlan brief
VLAN Name                      Status    Ports
---- ------------------------- --------- -------------------------------
1    default                   active    Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                         Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                         Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                         Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                         Fa0/21, Fa0/22, Fa0/23, Fa0/24
```
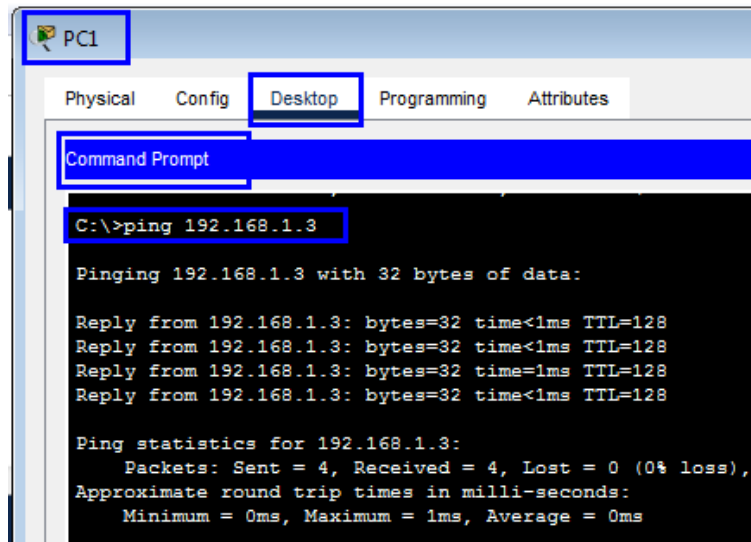
```
                            Gig0/1, Gig0/2
10   IT                     active    Fa0/1, Fa0/3
20   ADMIN                     active    Fa0/2, Fa0/4
1002 fddi-default               active
1003 token-ring-default            active
1004 fddinet-default             active
1005 trnet-default              active
```
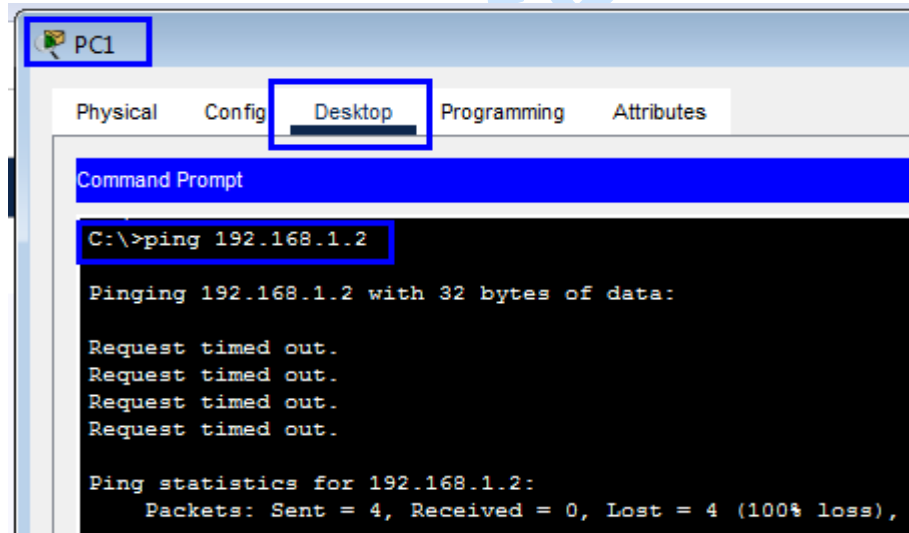
Step6: Ping test between Same VLAN PC and different VLAN PC:

Same VLAN PC:

Different VLAN PC:

Result: Same VLAN PC is getting to ping but different VLAN PC is not getting ping.