

Virtual Local Area Network

What is VLAN

- ▶ VLAN is simply a logical LAN, just as its name suggests.
- ▶ VLANs have similar characteristics with those of physical LANs, only that with VLANs, you can logically group hosts even if they are physically located on separate LAN segments.
- ▶ Why we need VLAN?

Benefit of using VLAN

- ▶ Reduce Overhead
- ▶ Group Users by department or function
- ▶ the layout of the network equipment does not match the organization's structure
- ▶ more Security as we can keep sensitive device on VLAN

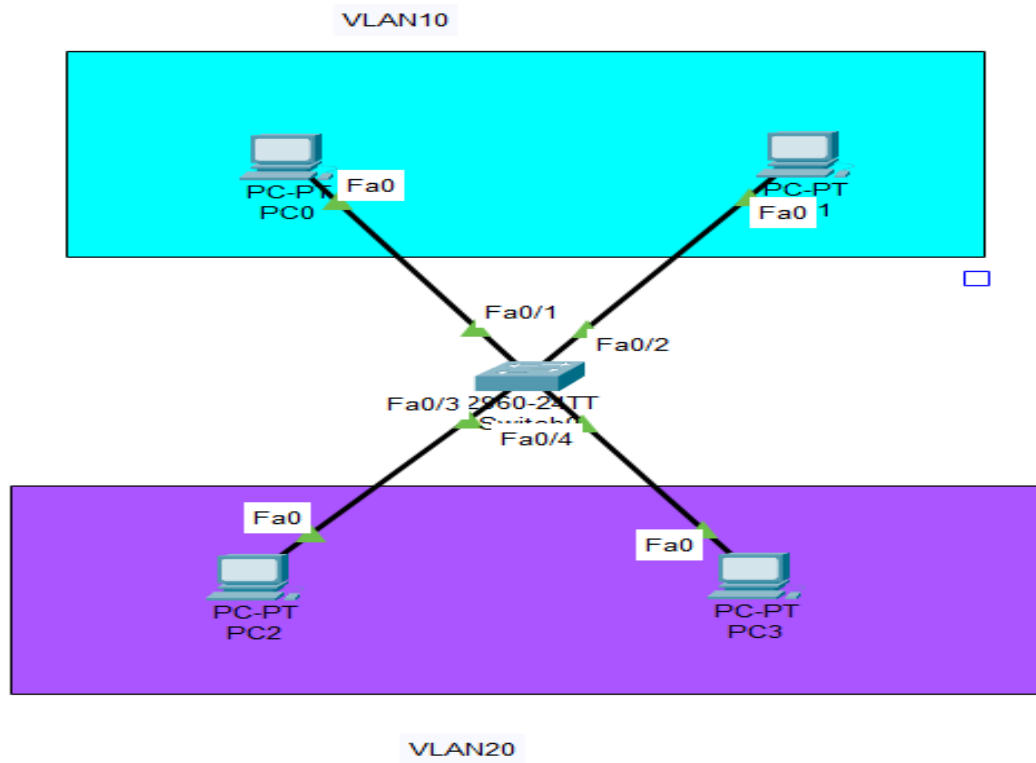
set up a VLAN-based network

- ▶ the network administrator decides how many VLANs there will be,
- ▶ which computers will be on which VLAN,
- ▶ what the VLANs will be called

► suppose we need to create two VLANS each VLAN has two pc so the device that we need is:

1. Four PC
2. Switch
3. Cables

Create VLAN in packet tracker



Create two vlans on the switch

- ▶ Create two vlans 10,20 on switch
 - ▶ Switch>enable
 - ▶ Switch#config t
 - ▶ Switch(config)#vlan 10
 - ▶ Switch(config-vlan)#vlan 20
 - ▶ Switch(config-vlan)#
- ▶ Verify that the two vlans are created by run
- ▶ **show vlan** commands

```
Switch#show vlan
```

| 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 | VLAN0010 | active | |
| 20 | VLAN0020 | active | |

Assign switch ports to the VLANs

- ▶ switch ports could be either access or trunk.
- ▶ An ***access port*** is assigned to a single VLAN . These ports are configured for switch ports that connect to devices with a normal network card, for example a PC in a network.
- ▶ A ***trunk port*** on the other hand is a port that can be connected to another switch or router. This port can carry traffic of multiple VLANs.

Configure switch ports










- ▶ `Switch(config)#interface range f0/1-2`
- ▶ `Switch(config-if-range)#switchport access vlan 10`
- ▶ `Switch(config-if-range)#interface range f0/3-4`
- ▶ `Switch(config-if-range)#switchport access vlan 20`
- ▶ `Switch(config-if-range)#int range fa0/1-4`
- ▶ `Switch(config-if-range)#switchport mode access`

Assign static IP addresses to the four PCs

- ▶ **PC0** IP address 192.168.1.10 Subnet mask 255.255.255.0 Default gateway 192.168.1.1
- ▶ **PC1:** IP address 192.168.1.20 Subnet mask 255.255.255.0 Default gateway 192.168.1.1
- ▶ **PC2:** IP address 192.168.2.10 Subnet mask 255.255.255.0 Default gateway 192.168.2.1
- ▶ **PC3:** IP address 192.168.2.20 Subnet mask 255.255.255.0 Default gateway 192.168.2.1

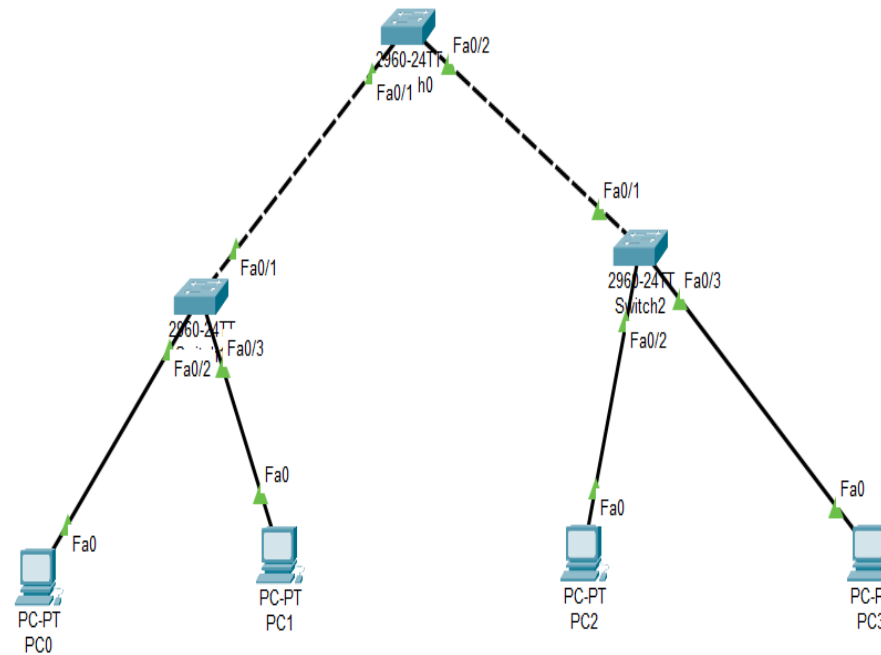
Test the connection

- ▶ Ping from pc0 to pc1
- ▶ Ping from pc0 to pc2
- ▶ Ping from pc3 to pc1
- ▶ Ping from pc2 to pc3

| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num | Edit | Delete |
|---|-------------|--------|-------------|------|---|-----------|----------|-----|--------|--------|
|  | Successful | PC0 | PC1 | ICMP |  | 0.000 | N | 0 | (edit) | |
|  | Failed | PC0 | PC2 | ICMP |  | 0.000 | N | 1 | (edit) | |
|  | Failed | PC3 | PC1 | ICMP |  | 0.000 | N | 2 | (edit) | |
|  | ... | --- | --- | ---- | --- | ---- | .. | - | ... | |
|  | Successful | PC2 | PC3 | ICMP |  | 0.000 | N | 3 | (edit) | |

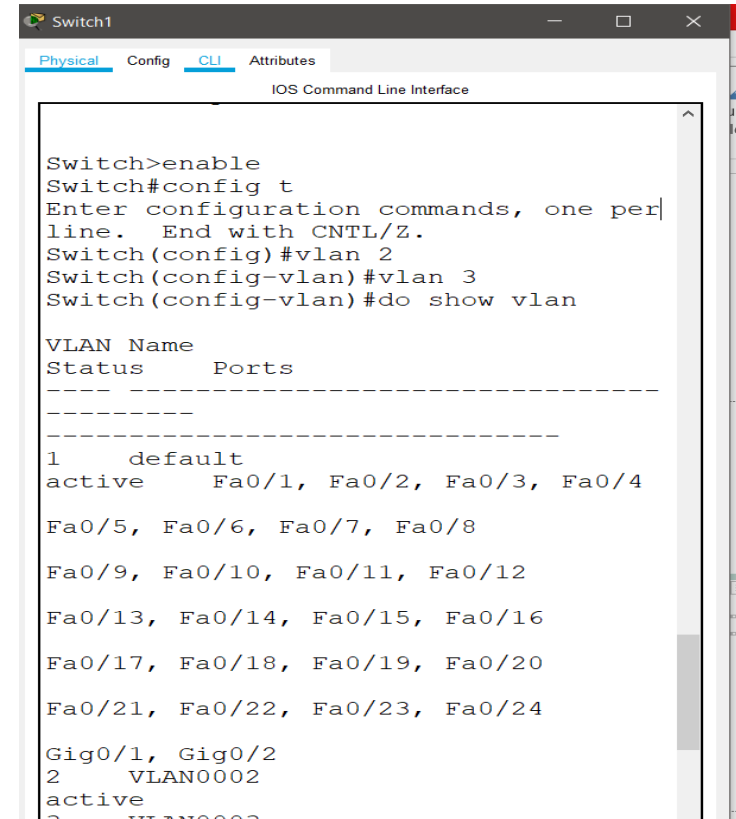
LAN Example 2

- ▶ Devices
 - ▶ 3 switch
 - ▶ 4 PCs
 - ▶ Cables
- ▶ PC0 and PC2 is on vlan2
- ▶ PC1 and PC3 is on vlan3



Create Valns for switch 1

- ▶ Switch>enable
- ▶ Switch#config t
- ▶ Enter configuration commands, one per line. End with CNTL/Z.
- ▶ Switch(config)#vlan 2
- ▶ Switch(config-vlan)#vlan 3
- ▶ Switch(config-vlan)#do show vlan



The screenshot shows a network switch named 'Switch1' with tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, displaying the 'IOS Command Line Interface'. The commands entered are: 'Switch>enable', 'Switch#config t', 'Switch(config)#vlan 2', 'Switch(config-vlan)#vlan 3', and 'Switch(config-vlan)#do show vlan'. The output shows the status of VLANs 1, 2, and 3. VLAN 1 is the default, active, and includes ports Fa0/1 through Fa0/24. VLAN 2 is named 'VLAN0002' and is active. VLAN 3 is named 'VLAN0003' and is also active.

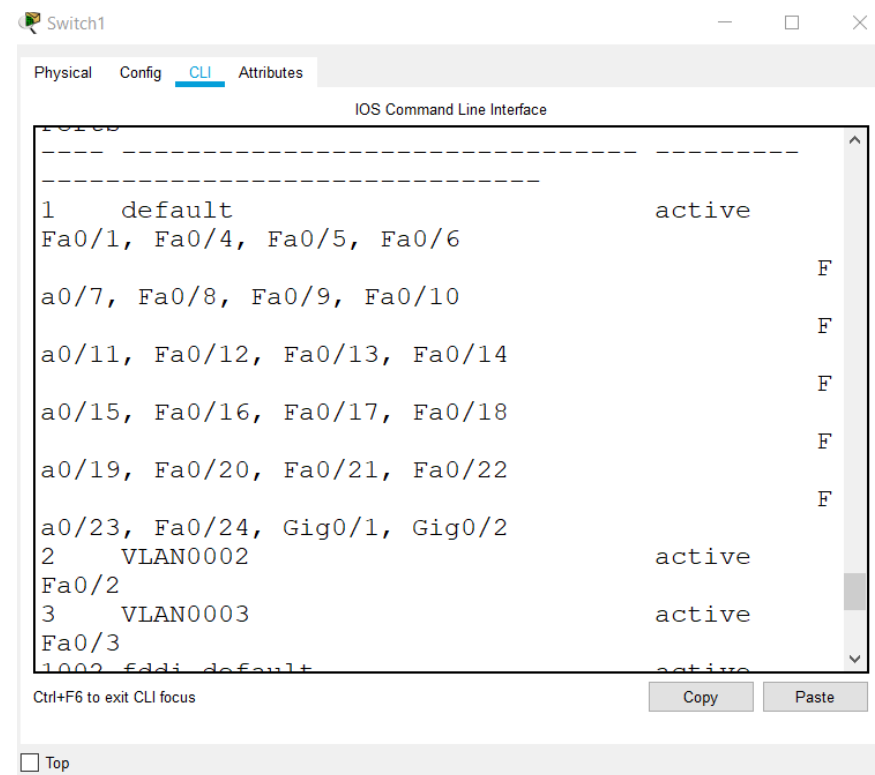
```
Switch1
Physical Config CLI Attributes
IOS Command Line Interface

Switch>enable
Switch#config t
Enter configuration commands, one per
line. End with CNTL/Z.
Switch(config)#vlan 2
Switch(config-vlan)#vlan 3
Switch(config-vlan)#do show vlan

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
2 VLAN0002
active
3 VLAN0003
active
```

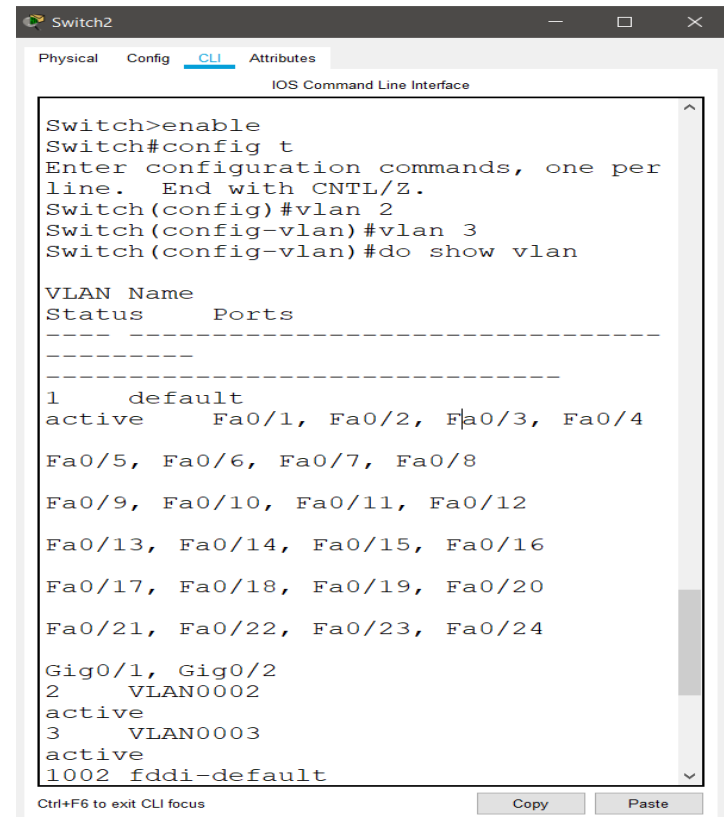
Assign switch ports to the VLANs for switch 1

- ▶ Switch(config)#interface f0/2
- ▶ Switch(config-if)#switchport mode access
- ▶ Switch(config-if)#switchport access vlan 2
- ▶ Switch(config-if)#exit
- ▶ Switch(config)#interface f0/3
- ▶ Switch(config-if)#switchport access vlan 3
- ▶ Switch(config-if)#do show vlan



Create Vlns for switch 2

- ▶ Switch>enable
- ▶ Switch#config t
- ▶ Enter configuration commands, one per line. End with CNTL/Z.
- ▶ Switch(config)#vlan 2
- ▶ Switch(config-vlan)#vlan 3
- ▶ Switch(config-vlan)#do show vlan



The screenshot shows a network switch interface with tabs for Physical, Config, CLI, and Attributes. The CLI tab is active, displaying the following commands and output:

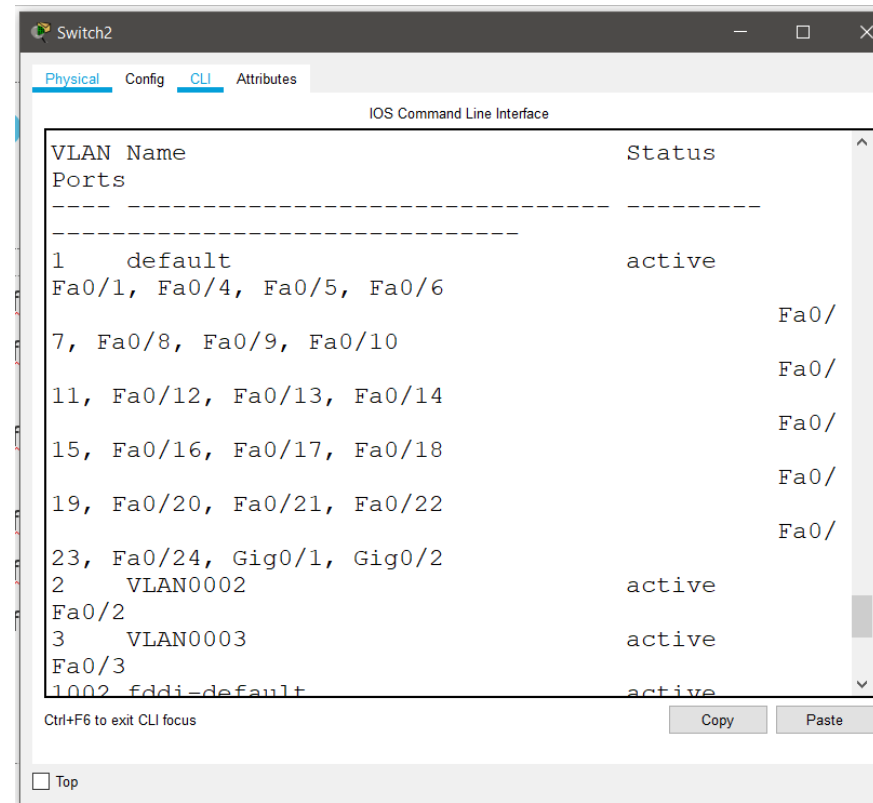
```
Switch>enable
Switch#config t
Enter configuration commands, one per
line. End with CNTL/Z.
Switch(config)#vlan 2
Switch(config-vlan)#vlan 3
Switch(config-vlan)#do show vlan
```

| 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 |
| 2 | VLAN0002 | active | |
| 3 | VLAN0003 | active | |
| 1002 | fddi-default | | |

At the bottom of the CLI window, there is a status bar with the text "Ctrl+F6 to exit CLI focus" and two buttons: "Copy" and "Paste".

Assign switch ports to the VLANs for switch 2

- ▶ Switch(config)#int f0/2
- ▶ Switch(config-if)#switchport mode access
- ▶ Switch(config-if)#switchport access vlan 2
- ▶ Switch(config-if)#exit
- ▶ Switch(config)#interface f0/3
- ▶ Switch(config-if)#switchport access vlan 3



The screenshot shows a network switch's CLI interface with the following table of VLAN configurations:

| VLAN | Name | Status |
|------|--------------|--------|
| 1 | default | active |
| 2 | VLAN0002 | active |
| 3 | VLAN0003 | active |
| 1002 | fddi-default | active |

Below the table, the assigned ports for each VLAN are listed:

- VLAN 1: Fa0/1, Fa0/4, Fa0/5, Fa0/6, 7, Fa0/8, Fa0/9, Fa0/10, 11, Fa0/12, Fa0/13, Fa0/14, 15, Fa0/16, Fa0/17, Fa0/18, 19, Fa0/20, Fa0/21, Fa0/22, 23, Fa0/24, Gig0/1, Gig0/2
- VLAN 2: Fa0/2
- VLAN 3: Fa0/3

The interface also includes a 'Top' button and a 'Copy' button.

Creat vlan3 for switch 3 and change port mode







- ▶ Switch#configure t
- ▶ Switch(config)#vlan 2
- ▶ Switch(config-vlan)#vlan 3
- ▶ Switch(config-vlan)#exit
- ▶ Switch(config)#interface range f0/1-2
- ▶ Switch(config-if-range)#switchport mode trunk

Assign static IP addresses to the four PCs

- ▶ **PC0** IP address 192.168.1.10 Subnet mask 255.255.255.0
- ▶ **PC1:** IP address 192.168.2.10 Subnet mask 255.255.255.0
- ▶ **PC2:** IP address 192.168.1.20 Subnet mask 255.255.255.0
- ▶ **PC3:** IP address 192.168.2.20 Subnet mask 255.255.255.0

Test the connection

- ▶ Test connection by running ping command from device to another device
- ▶ Or send message from device to device

| <div>🕒 Realtime ⚙️ Simulation</div> | | | | | | | | | | |
|---|-------------|--------|-------------|------|---|-----------|----------|-----|--------|----------|
| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num | Edit | Delete |
|  | Failed | PC0 | PC1 | ICMP |  | 0.000 | N | 0 | (edit) | (delete) |
|  | Successful | PC0 | PC2 | ICMP |  | 0.000 | N | 1 | (edit) | (delete) |
|  | Failed | PC1 | PC2 | ICMP |  | 0.000 | N | 2 | (edit) | (delete) |

Thank You