# Virtual Local Area Network

Created By Shereen Khalaf

# 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

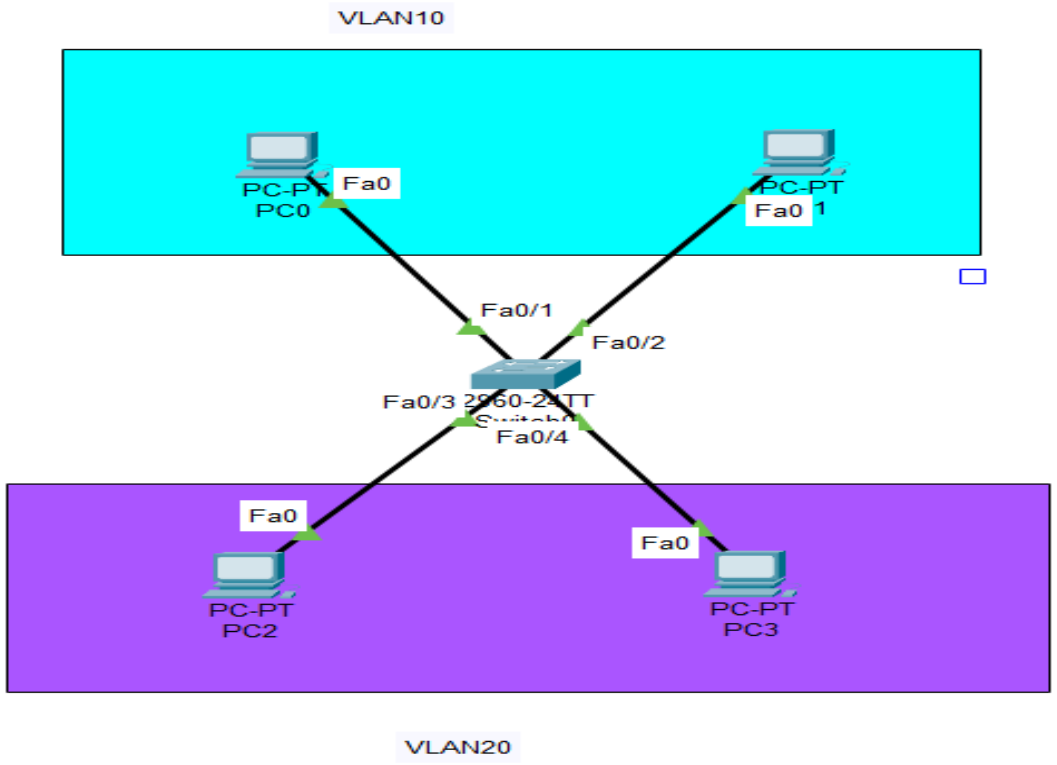
- Reduce Overhead
- Group Users by department or function
- the layout of the network equipment does not match the organization’s structure
- more Security  as we can keep sensitive device on VLAN

# 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

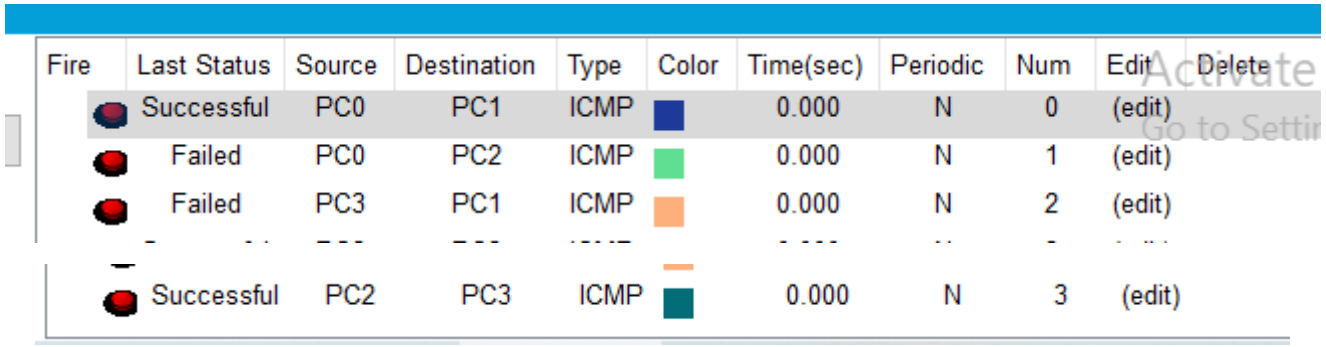
- Switch(config)#interface range f0/1-2
- Switch(config-if-range)#switchport access vlan 10
- Switch(config-if-range)#interface range f0/3-4
- Switch(config-if-range)#switchport access vlan 20
- Switch(config-if-range)#int range fa0/1-4
- Switch(config-if-range)#switchport mode access

# 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

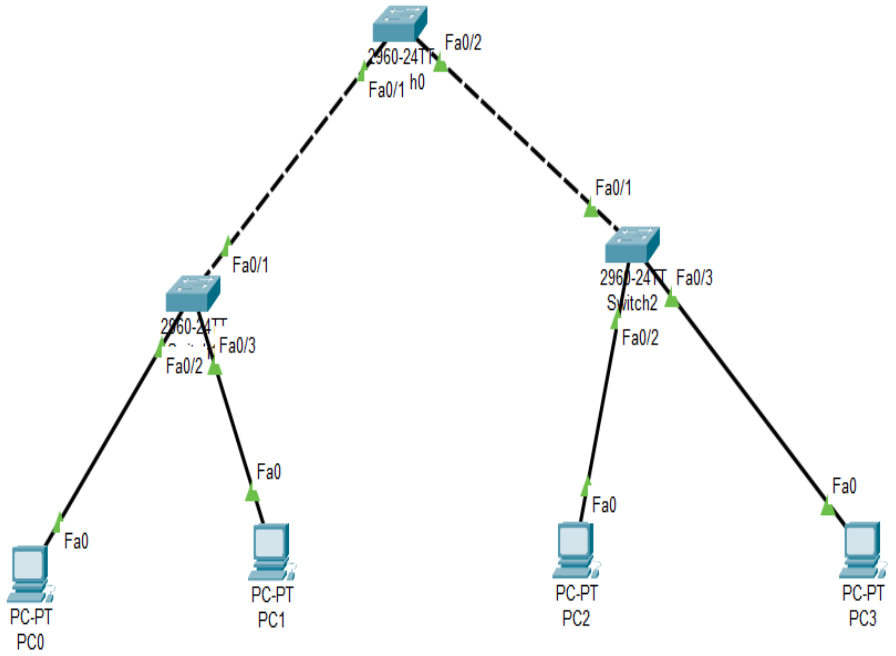
- Ping from pc0 to pc1
- Ping from pc0 to pc2
- Ping from pc3 to pc1
- Ping from pc2 to pc3



| 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) | |

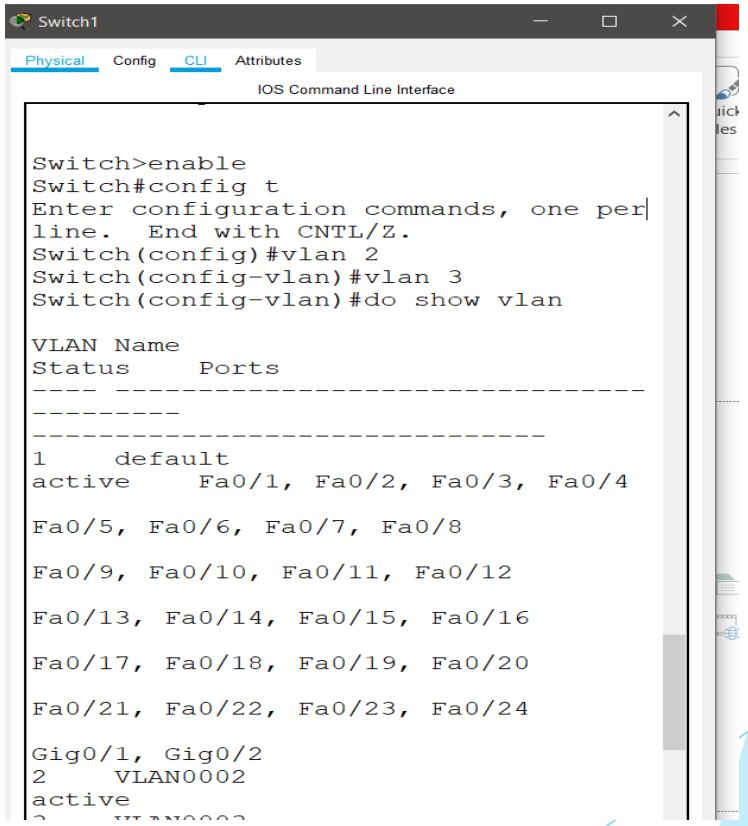
# LAN Example 2

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



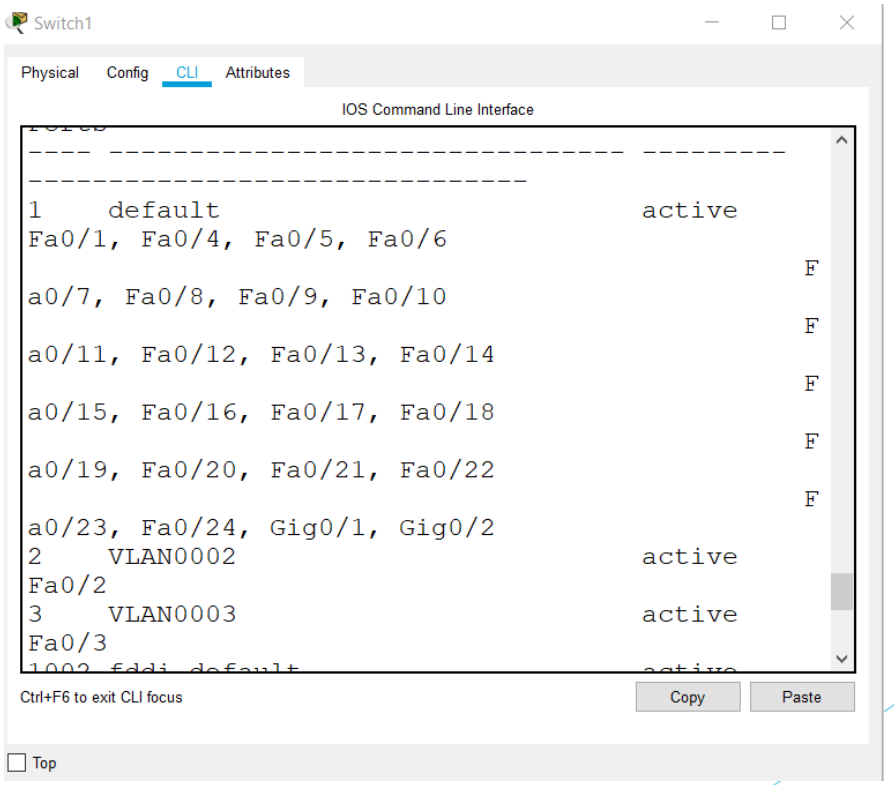
# Create Valns for switch 1

- 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



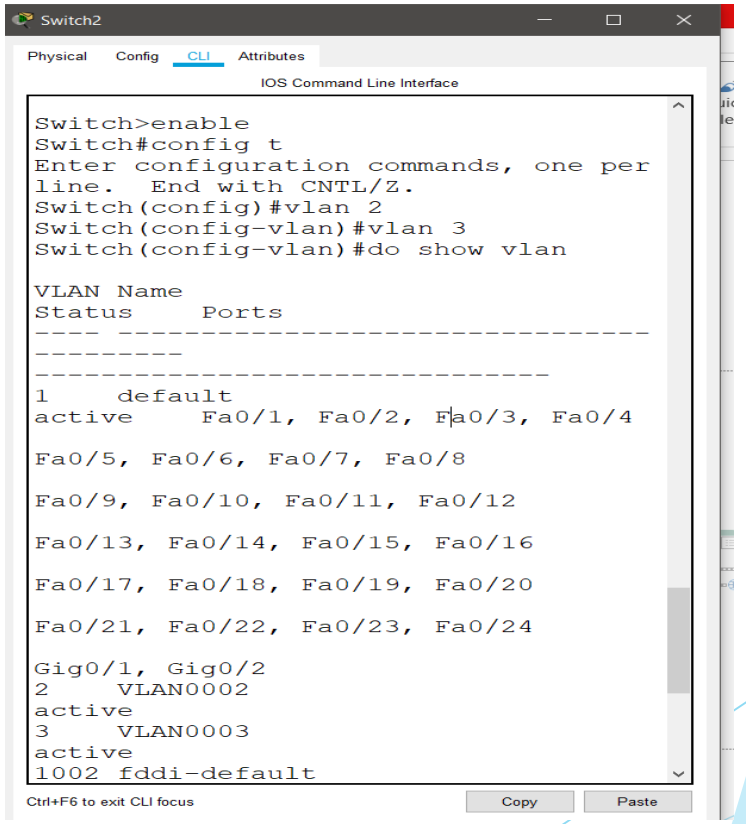
# Assign switch ports to the VLANs for switch 1

- 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



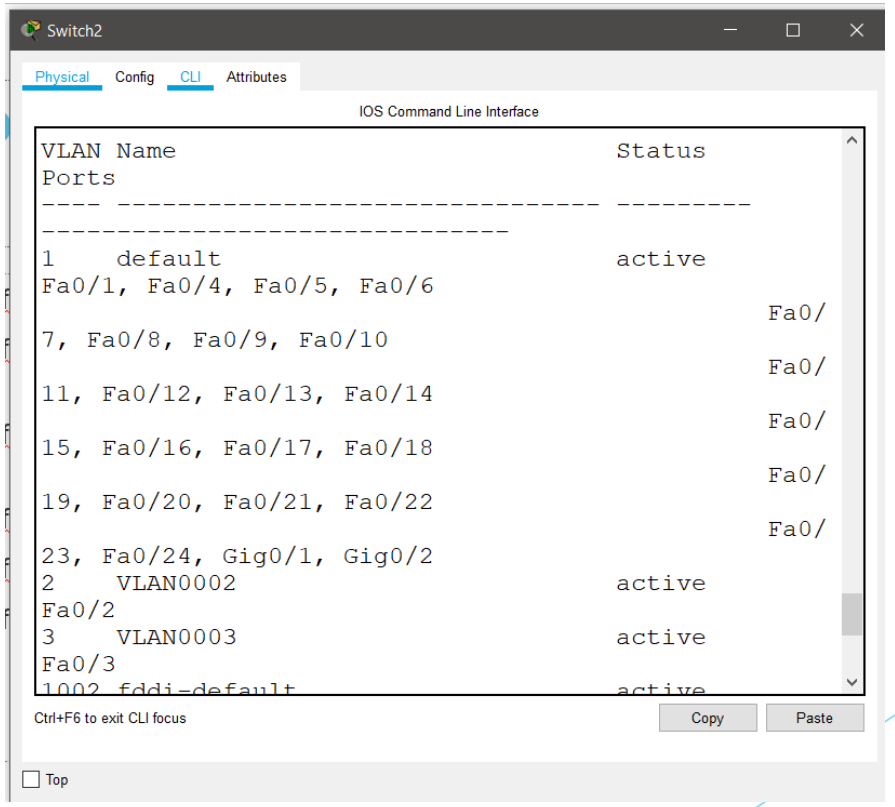
# Create Valns for switch 2

- 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



# 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



# Creat vlan3 for switch 3 and change port mode

- Switch#configure t

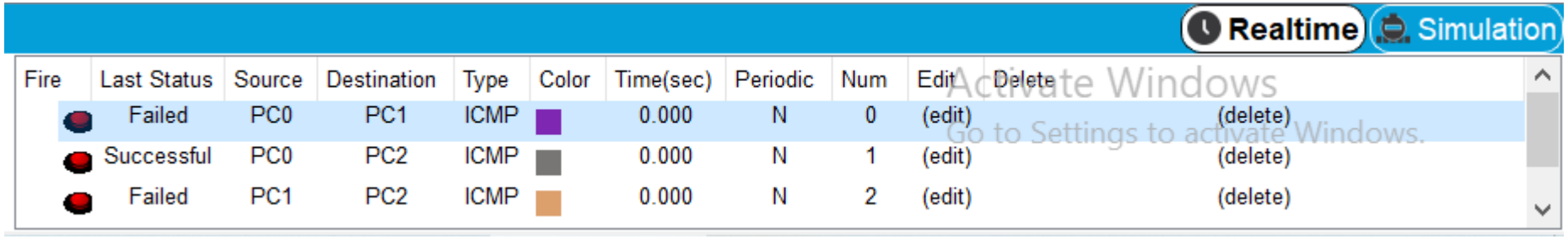
- Switch(config)#vlan 2
- Switch(config-vlan)#vlan 3
- Switch(config-vlan)#exit
- Switch(config)#interface range f0/1-2
- Switch(config-if-range)#switchport mode trunk

# 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



# Thank You