# BUBT

**BANGLADESH UNIVERSITY OF BUSINESS AND TECHNOLOGY**

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Lab Report

Course Code: CSE 320

Course Title: Computer Networks Lab

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**Report number:** 04

**Report name:** Configuration of Virtual Local Area Network (VLAN).

**Objectives:**

The purpose of this lab was to learn about the configure of Virtual Area Network (VLAN).

**Tools and Technology:**

- Cisco Packet Tracer (version 8.0.0)
- End devices
- Switch
- Copper Straight-Through Connection

**Theory:**

## VLAN

A VLAN (Virtual Local Area Network) is a subnetwork which can group together collections of devices on separate physical local area networks (LANs). VLAN in networking is a virtual extension of LAN. A LAN is a group of computer and peripheral devices which are connected in a limited area such as school, laboratory, home, and office building. It is a widely useful network for sharing resources like files, printers, games, and other applications. VLANs are important because they can help improve the overall performance of a network by grouping together devices that communicate most frequently. VLANs also provide security on larger networks by allowing a higher degree of control over which devices have access to each other. VLANs tend to be flexible because they are based on logical connections, rather than physical. Without VLANs, a broadcast sent from a host can easily reach all network devices. Each and every device will process broadcast received frames. It can increase the CPU overhead on each device and reduce the overall network security. VLANs have the same attributes as physical LANs, but you can group end stations even if they are not physically connected to the same switch.

# CLI Command Modes

The CLI command modes support specific Cisco IOS commands. These are the main command modes for the switch:

| No. | Command Mode | Access Mode | Prompt | Exit or Access Next Mode |
|---|---|---|---|---|
| 1. | User mode | This is the first level of access. (For the switch). | Switch> | To enter privileged mode, enter the *enable/ en* command. |
| 2. | Privilege mode | From user mode, enter the enable command. | Switch# | To enter configuration mode, enter the *configure/ config t* command. <br><br> To exit privilege mode, enter *Switch#exit* |
| 3. | Configuration mode | From privileged mode, enter the configure command. | Switch(config)# | To exit configuration mode, enter *Switch(config)#exit* |

# VLAN Configuration

VLANs are numbered from 1 to 4094 (extended range). All configured ports belong to the default VLAN when we first bring up the switch. The default VLAN (VLAN1) uses only default values, and we cannot create, delete, or suspend activity in the default VLAN. We can create a VLAN by assigning a number to it; we can delete VLANs as well as moving them from the active operational state to the suspended operational state. If we attempt to create a VLAN with an existing VLAN ID, the switch goes into the VLAN sub mode but does not create the same VLAN again.

*1) Commands to create a VLAN:*

```
switch#configure terminal / config t
    switch(config)# vlan number
switch(config-vlan)# name of vlan
```

The name in above configuration is optional but helps administrator to keep config clean.

*2) To assign ports to a VLAN:*

```
switch#configure terminal/ config t

    switch(config)#int port no

  switch(config-if)#sw mo access

switch(config-if)#sw access vlan no
```

*3) To verify the created VLANs:*
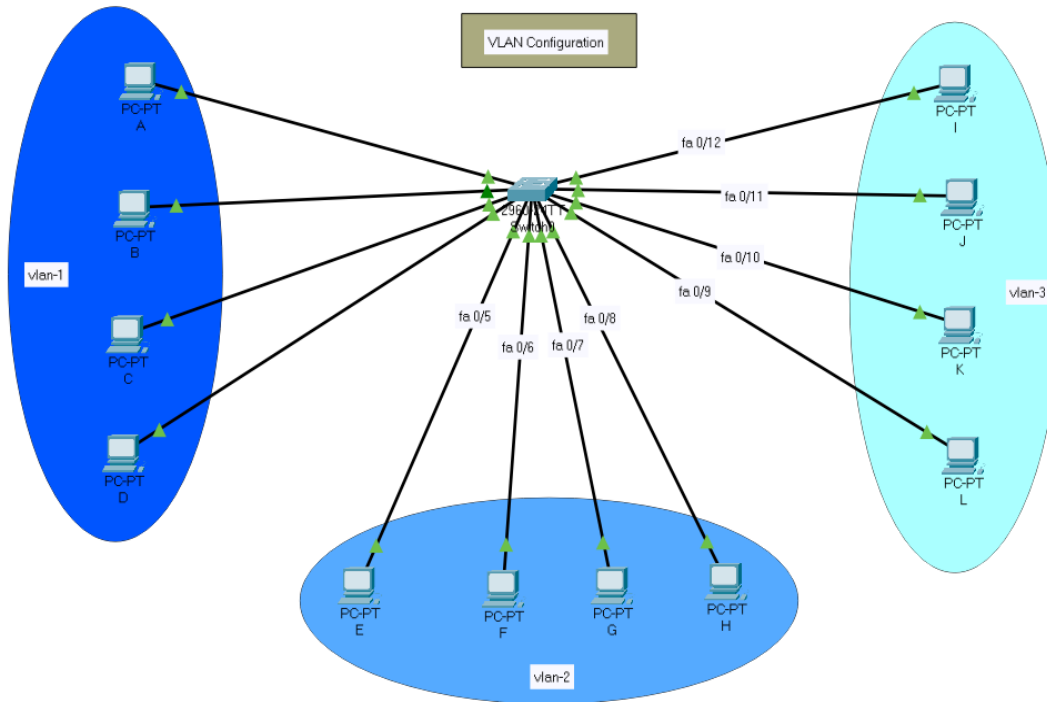
```
switch#show vlan/sh vlan
```

**Figures:**

**(1)**



Figure 1: VLAN Configuration

**(2)**

To write command go to the ISO Command Line Interface:



Figure 2: ISO Command Line Interface

**(3)**

```
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
```
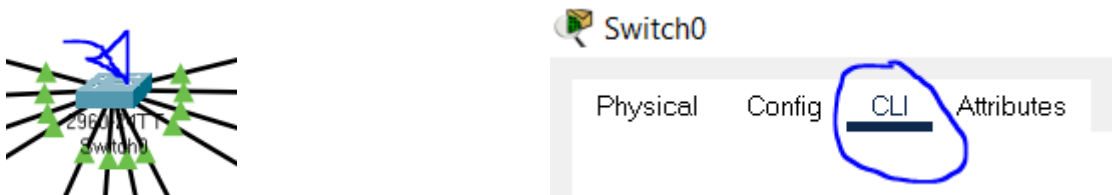
Figure 3: Default VLAN (VLAN 1)

**(4)**

In my lab work I created two VLANs using the commands as follows:

```
Primary Secondary Type               Ports
------- --------- ----------------- -------------------------
Switch# config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#vlan 2
Switch(config-vlan)#name cse
Switch(config-vlan)#vlan 3
Switch(config-vlan)#name eee
Switch(config-vlan)#exit
Switch(config)#exit
Switch#
```

Figure 4: Command to create VLANs

**(5)**

```
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    cse                              active
3    eee                              active
1002 fddi-default                     active
1003 token-ring-default               active
1004 fddinet-default                  active
1005 trnet-default                    active
```

Figure 5: New created VLAN (VLAN 1, VLAN 2)

In my lab work I used the following commands to assign ports:

```
Primary Secondary Type                Ports
------- --------- ---------------- ------------------------------
Switch#
Switch#config t
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#int fa 0/5
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 2
Switch(config-if)#int fa 0/6
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 2
Switch(config-if)#int fa 0/7
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 2
Switch(config-if)#int fa 0/8
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 2
Switch(config-if)#int fa 0/9
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 3
Switch(config-if)#int fa 0/10
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 3
Switch(config-if)#int fa 0/11
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 3
Switch(config-if)#int fa 0/12
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 3
Switch(config-if)#
```

Figure 6: Command to assign ports

**Output:**

| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num | Edit | Delete |
|------|-------------|--------|-------------|------|-------|-----------|----------|-----|------|--------|
| | Successful | A | C | ICMP | ■ | 0.000 | N | 0 | (edit) | (delete) |
| | Successful | F | H | ICMP | ■ | 0.000 | N | 3 | (edit) | (delete) |

Figure 7: Packet transmission between source to destination (same VLAN)

Here, we can see if the source and destination are within the same VLAN then packet transmission is successful.

| Fire | Last Status | Source | Destination | Type | Color | Time(sec) | Periodic | Num | Edit | Delete |
|------|-------------|--------|-------------|------|-------|-----------|----------|-----|------|--------|
|  | Failed | A | G | ICMP |  | 0.000 | N | 1 | (edit) | (delete) |
|  | Failed | A | I | ICMP |  | 0.000 | N | 2 | (edit) | (delete) |

Figure 8: Packet transmission between source to destination (same VLAN)

Here, we can see if the source and destination aren't within the same VLAN then packet transmission is failed.

**Conclusions:**

In this lab we have gained the knowledge of how to configure VLANs and learn different commands to do some particular works. For my work I used 12 end-devices and 3 VLANs. During designing the VLAN Configuration I didn't face any problem and I have successfully found the output as like I wanted.