



Date: 04 / 07 /2025

Lab Practical #05:

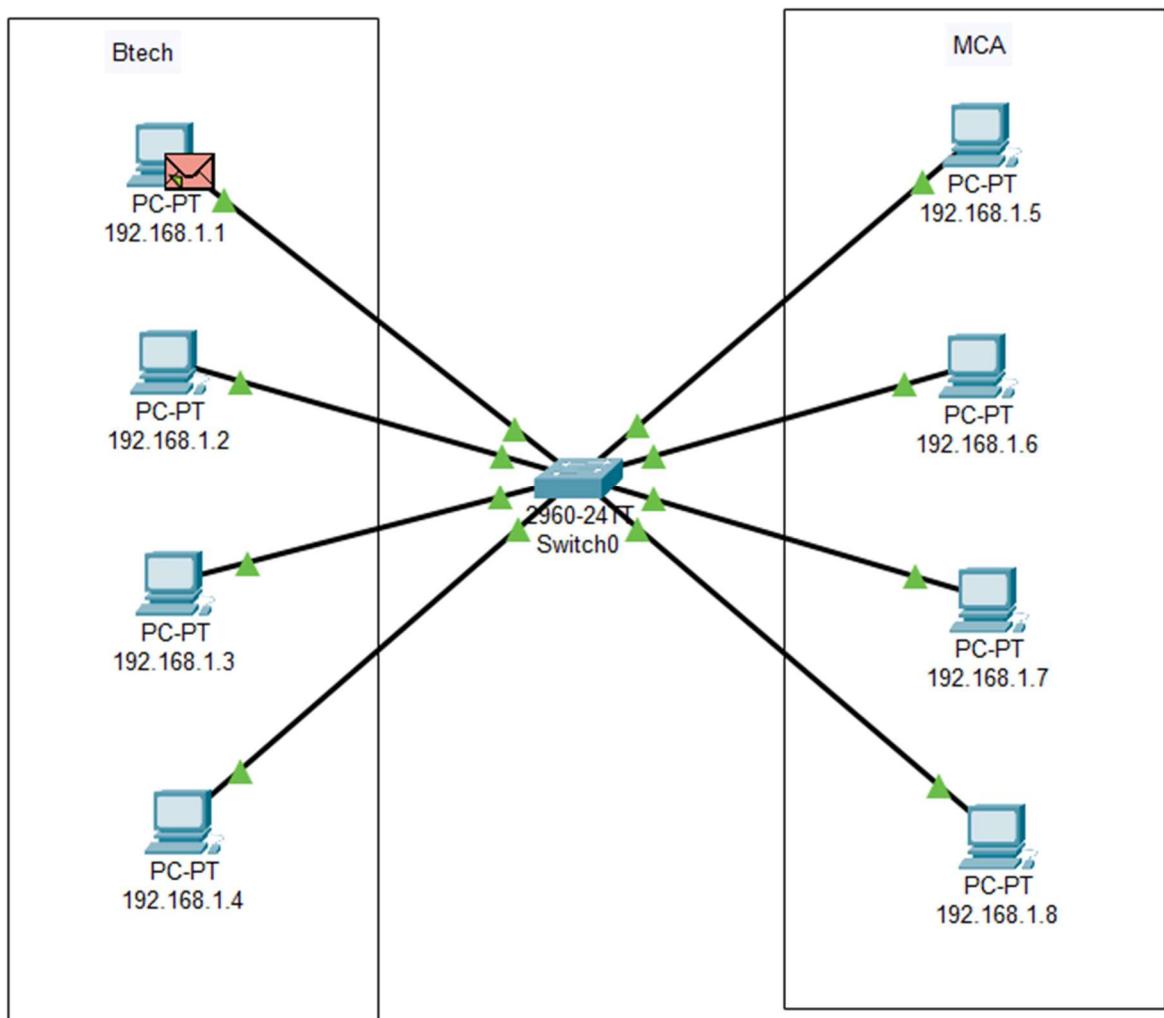
Study the concept of VLAN using packet tracer.

Practical Assignment #05:

1. Implement the different network structures in VLAN and VLAN trunking. Also check connectivity between them using ping command or PDU utility.

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1. VLAN_1:





DARSHAN INSTITUTE OF ENGINEERING & TECHNOLOGY

Semester 5th | Practical Assignment | Computer Networks (2301CS501)

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Switch0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/11

FastEthernet0/12

FastEthernet0/13

FastEthernet0/14

FastEthernet0/15

FastEthernet0/16

FastEthernet0/17

VLAN Configuration

VLAN Number	VLAN Name
20	MCA

Add Remove

VLAN No	VLAN Name
1	default
10	Btech
20	MCA
1002	fddi-default
1003	token-ring-default
1004	fddinet-default
1005	trnet-default

Equivalent IOS Commands

Switch0

Physical Config CLI Attributes

GLOBAL

Settings

Algorithm Settings

SWITCHING

VLAN Database

INTERFACE

FastEthernet0/1

FastEthernet0/2

FastEthernet0/3

FastEthernet0/4

FastEthernet0/5

FastEthernet0/6

FastEthernet0/7

FastEthernet0/8

FastEthernet0/9

FastEthernet0/10

FastEthernet0/11

FastEthernet0/12

FastEthernet0/13

FastEthernet0/14

FastEthernet0/15

FastEthernet0/16

FastEthernet0/17

FastEthernet0/1

Port Status

Bandwidth

Duplex

Access

VLAN

10

On 100 Mbps 10 Mbps Auto
Half Duplex Full Duplex Auto

Tx Ring Limit



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1.1 Steps to Create in Packet Tracer

1. Add Devices in Workspace

- Drag one **2960-24TT switch** into workspace.
- Add 8 PCs → split into two groups:
 - **BTECH Group (Left side)** → PC0, PC1, PC2, PC3.
 - **MCA Group (Right side)** → PC4, PC5, PC6, PC7.
- Connect each PC to the switch using **Straight-Through cables**.

2. Assign IP Addresses to PCs

On each PC → Desktop → IP Configuration:

- BTECH VLAN(VLAN 10)
 - PC0 → 192.168.1.2 / 255.255.255.0
 - PC1 → 192.168.1.3 / 255.255.255.0
 - PC2 → 192.168.1.4 / 255.255.255.0
 - PC3 → 192.168.1.5 / 255.255.255.0
- MCA VLAN (VLAN 20)
 - PC4 → 192.168.1.6 / 255.255.255.0
 - PC5 → 192.168.1.7 / 255.255.255.0
 - PC6 → 192.168.1.8 / 255.255.255.0
 - PC7 → 192.168.1.9 / 255.255.255.0

Add labels to each PC to display its **IP Address**.

3. Create VLANs on Switch

Click on the switch → **Config tab** → **VLAN Database**:

- VLAN 10 → Name: **BTECH** → Add.
- VLAN 20 → Name: **MCA** → Add.

4. Assign Switch Ports to VLANs

Go to **Switch** → **Config tab** → **Interfaces**.

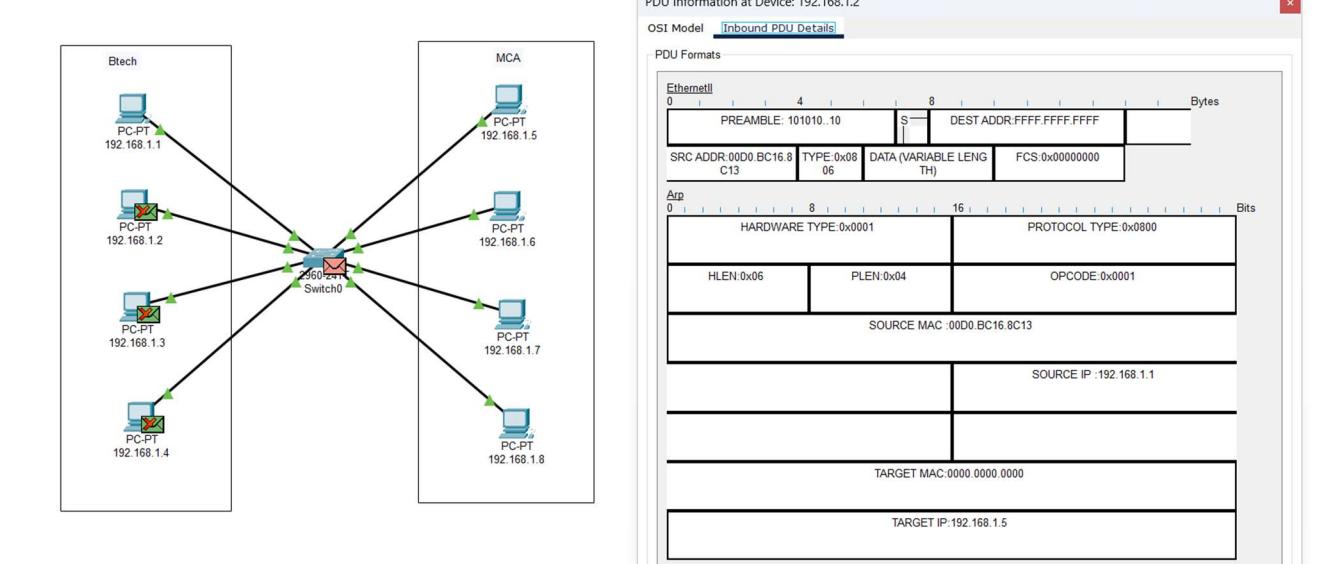
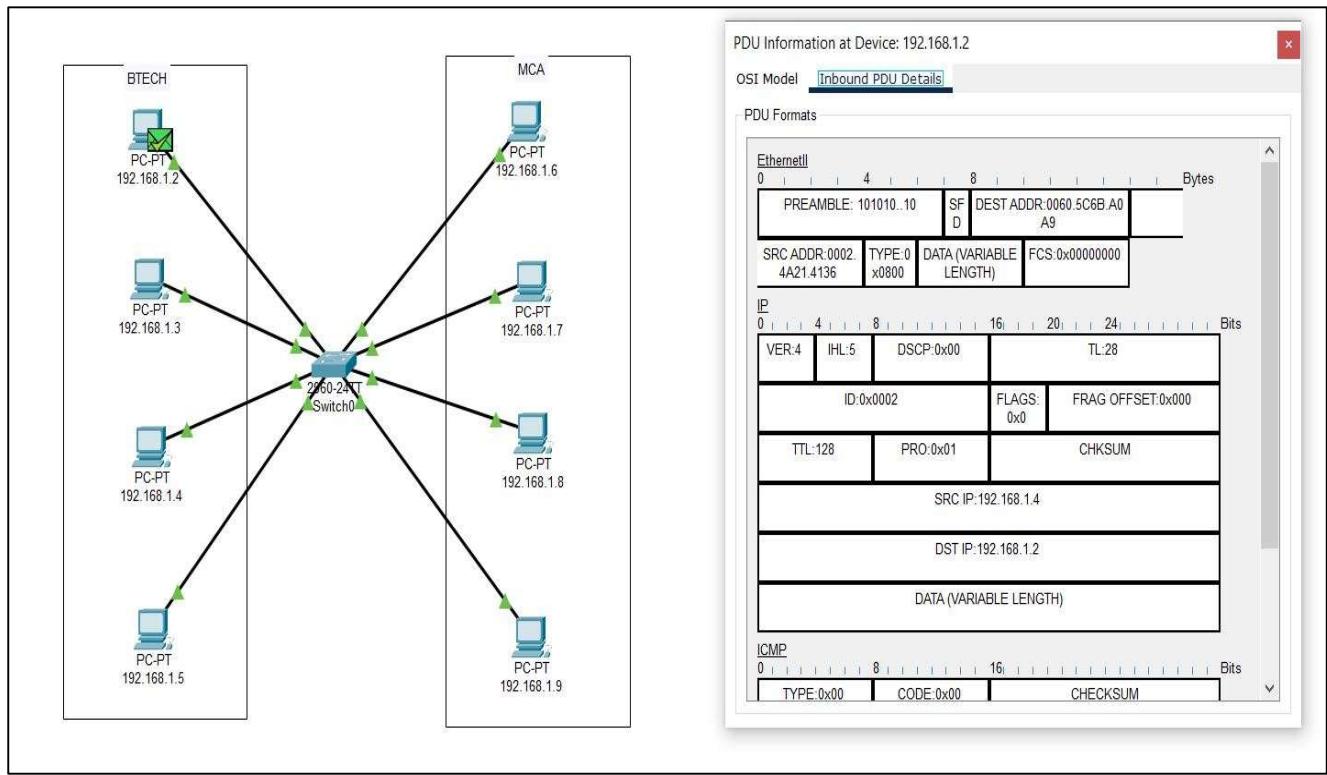
- Assign **FastEthernet 0/1 – 0/4** → VLAN 10 (BTECH).
- Assign **FastEthernet 0/5 – 0/8** → VLAN 20 (MCA).

This ensures each group of PCs belongs to its own VLAN.

5. Test VLAN Connectivity

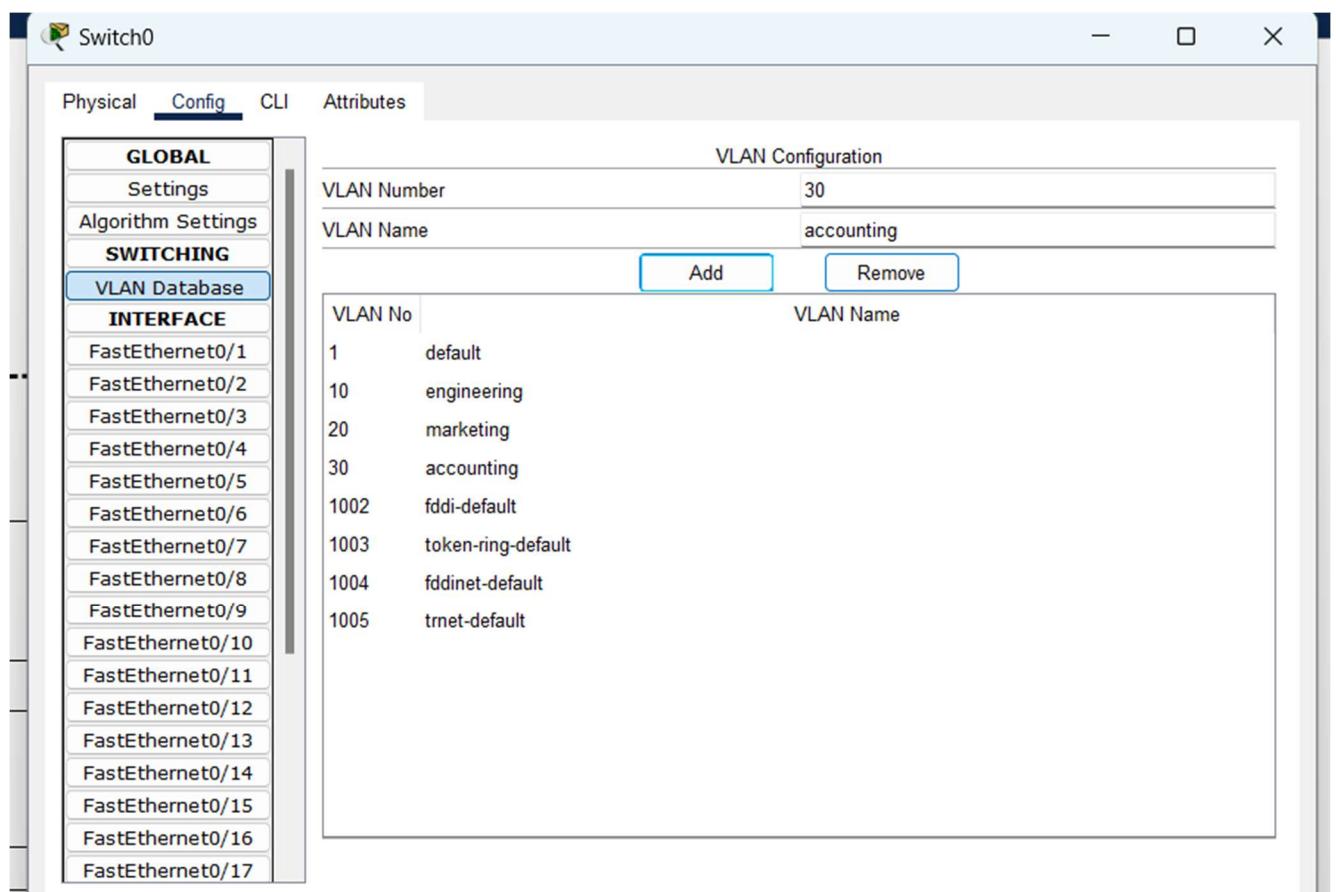
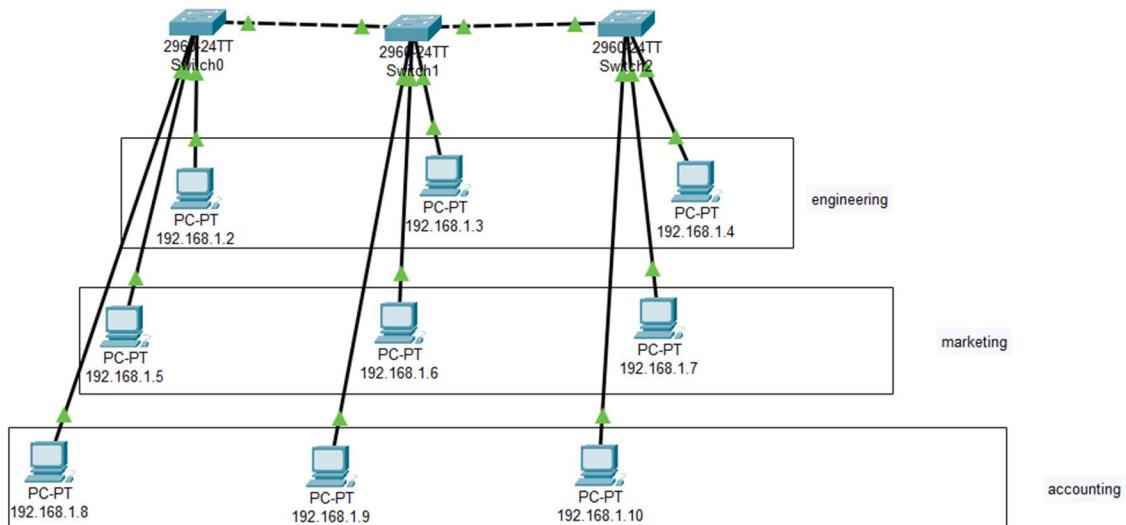
- Open **Command Prompt** on a PC.
- Ping another PC in the **same VLAN** → should be successful.
- Ping a PC in a **different VLAN** → will fail (unless VLAN trunking or router is configured).

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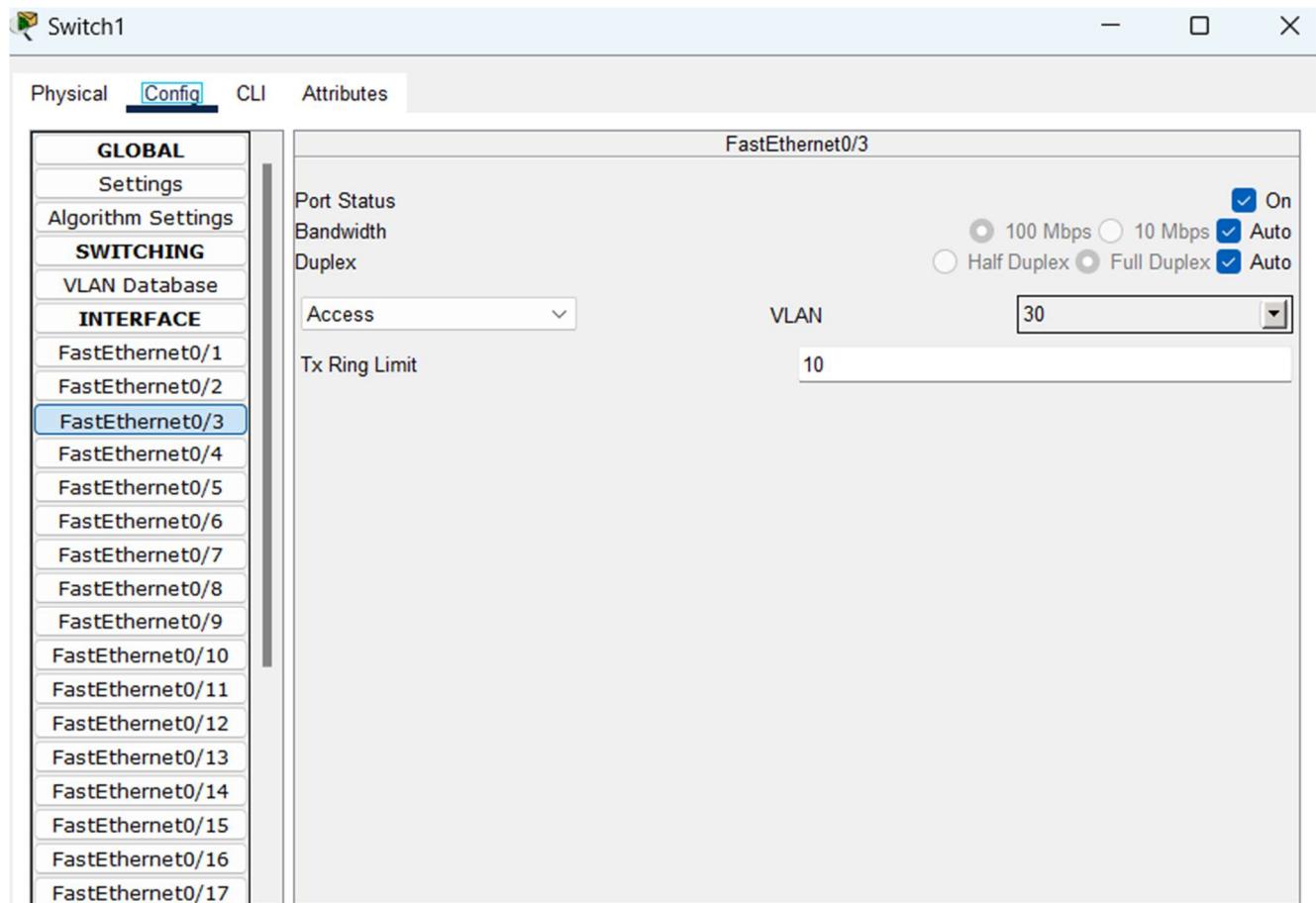
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2. VLAN_2:





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2.1 Steps To Create VLAN

1. Add Devices in Workspace

- Drag and drop 3 switches (2960-24TT) into workspace.
- Add 9 PCs and arrange them into 3 groups:
 - Engineering (3 PCs)
 - Marketing (3 PCs)
 - Accounting (3 PCs)
- Connect PCs to switches using **Straight-Through cables**.
- Connect switches together with **crossover cables**.

2. Assign IP Addresses to PCs

Configure each PC → Desktop → IP Configuration:

- Engineering VLAN (VLAN 10)
 - PC0 → 192.168.1.2 / 255.255.255.0
 - PC3 → 192.168.1.5 / 255.255.255.0
 - PC6 → 192.168.1.8 / 255.255.255.0



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- Marketing VLAN (VLAN 20)
 - PC1 → 192.168.1.3 / 255.255.255.0
 - PC4 → 192.168.1.6 / 255.255.255.0
 - PC7 → 192.168.1.9 / 255.255.255.0
- Accounting VLAN (VLAN 30)
 - PC2 → 192.168.1.4 / 255.255.255.0
 - PC5 → 192.168.1.7 / 255.255.255.0
 - PC8 → 192.168.1.10 / 255.255.255.0

Add labels to each PC to display its **IP Address**.

3. Create VLANs on Each Switch

Click on each switch → **Config tab** → **VLAN Database**:

- VLAN 10 → Name: **Engineering** → Add.
- VLAN 20 → Name: **Marketing** → Add.
- VLAN 30 → Name: **Accounting** → Add.

Do this on **Switch0**, **Switch1**, and **Switch2**

4. Assign Ports to VLANs

For each switch → Config tab → select **Interface (FastEthernet)** → assign VLAN.

Example for **Switch0**:

- Port F0/1 → VLAN 10 (PC 192.168.1.2 – Engineering)
- Port F0/2 → VLAN 20 (PC 192.168.1.3 – Marketing)
- Port F0/3 → VLAN 30 (PC 192.168.1.4 – Accounting)

Similarly configure **Switch1** and **Switch2**.

5. Configure Trunk Links Between Switches

For switch-to-switch connections:

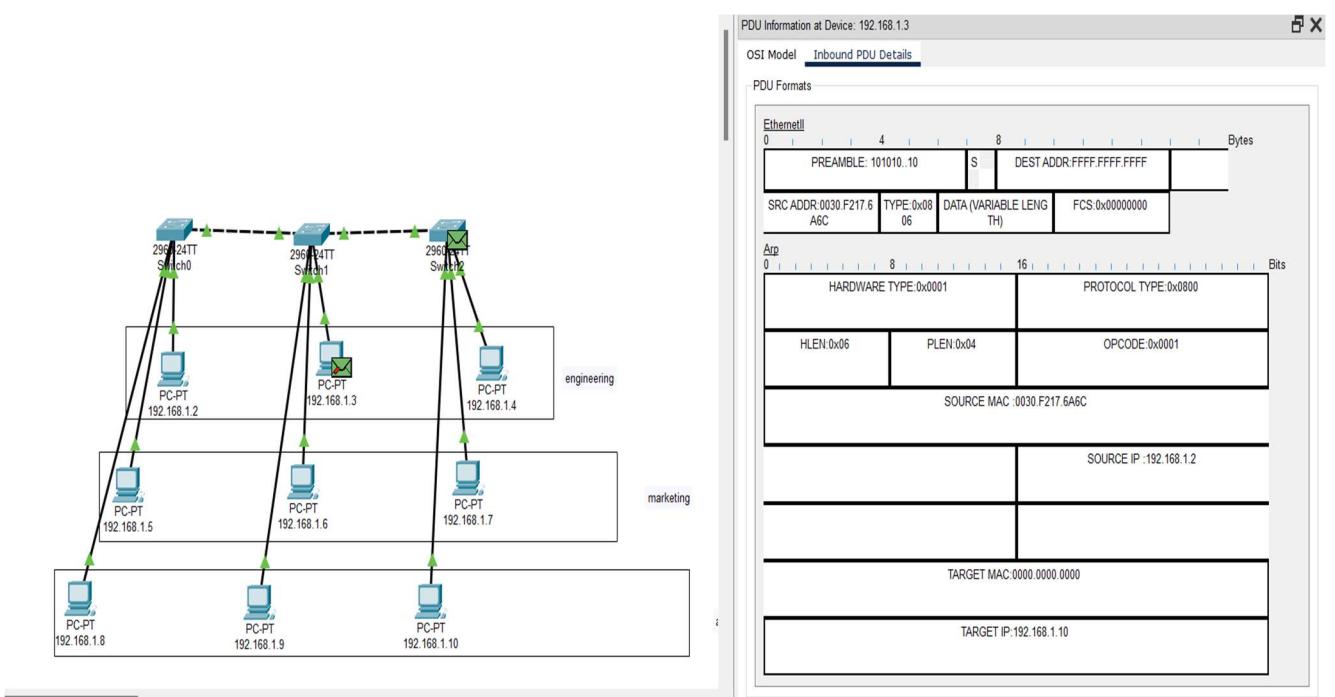
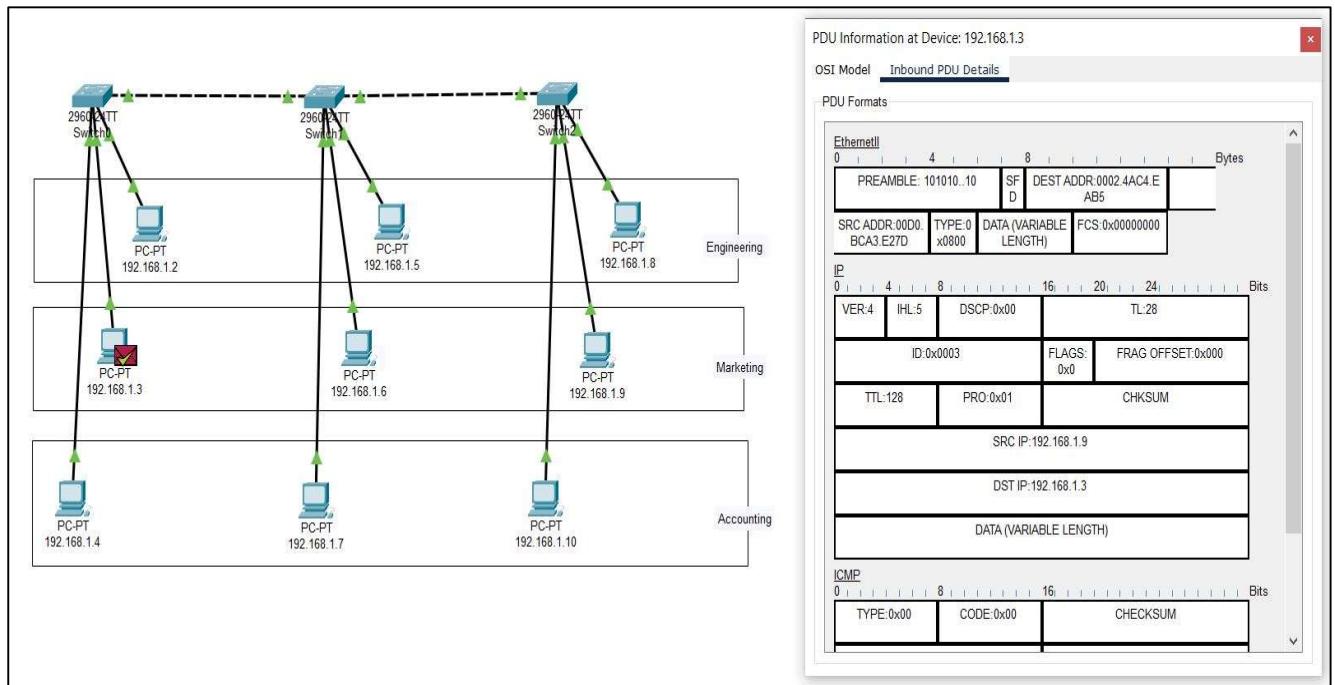
- Select interface where switches are connected
- Set **Mode → Trunk**.
- This allows VLAN 10, 20, and 30 traffic to pass across switches.

Repeat for all inter-switch connections.

6. Test VLAN Connectivity

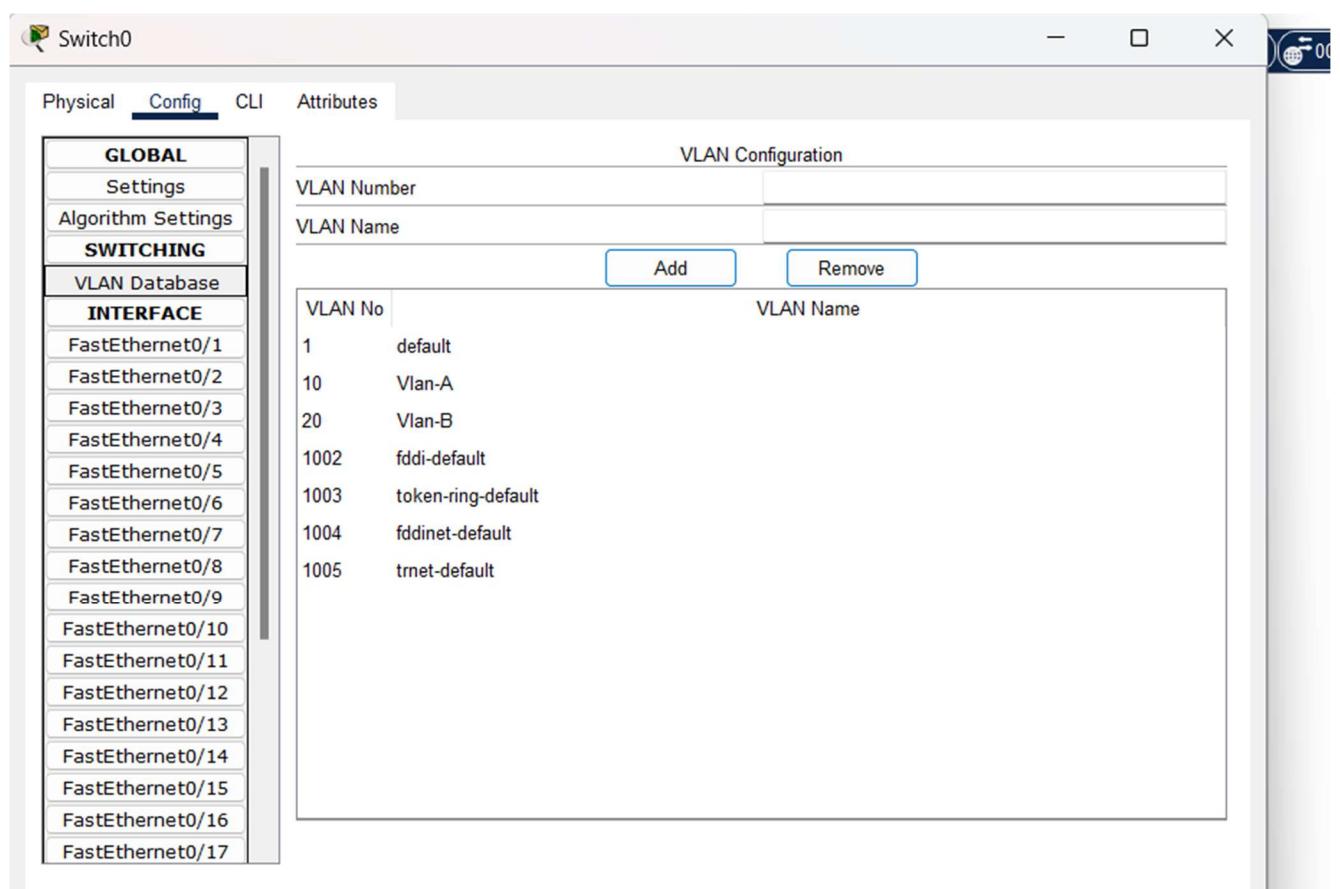
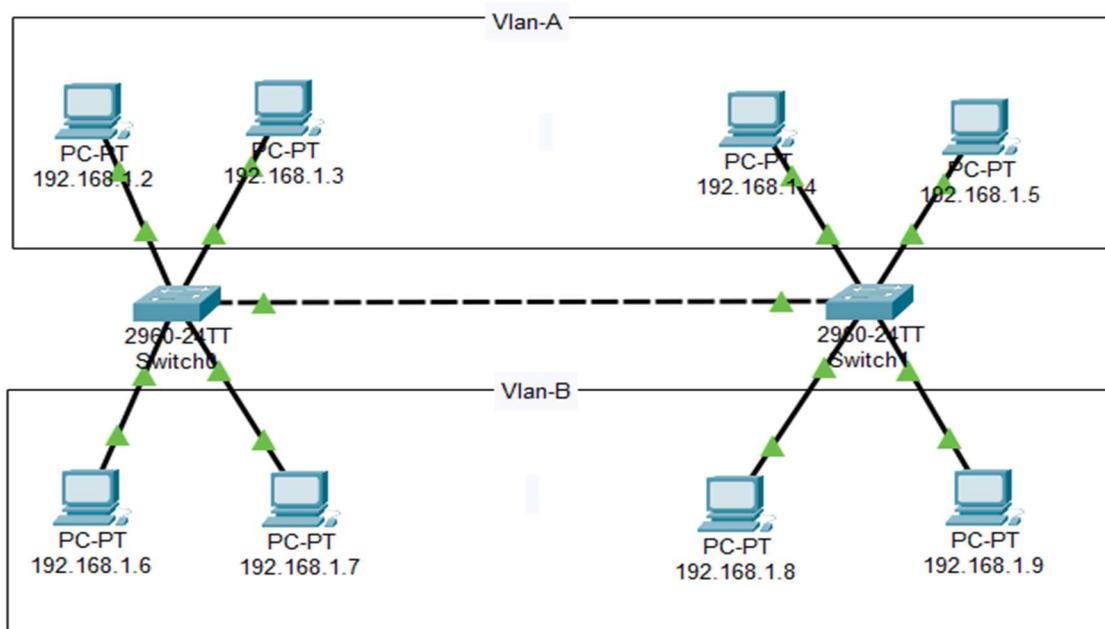
- Open **Command Prompt** on a PC.
- Ping another PC in the **same VLAN** → should be successful.
- Ping a PC in a **different VLAN** → will fail.

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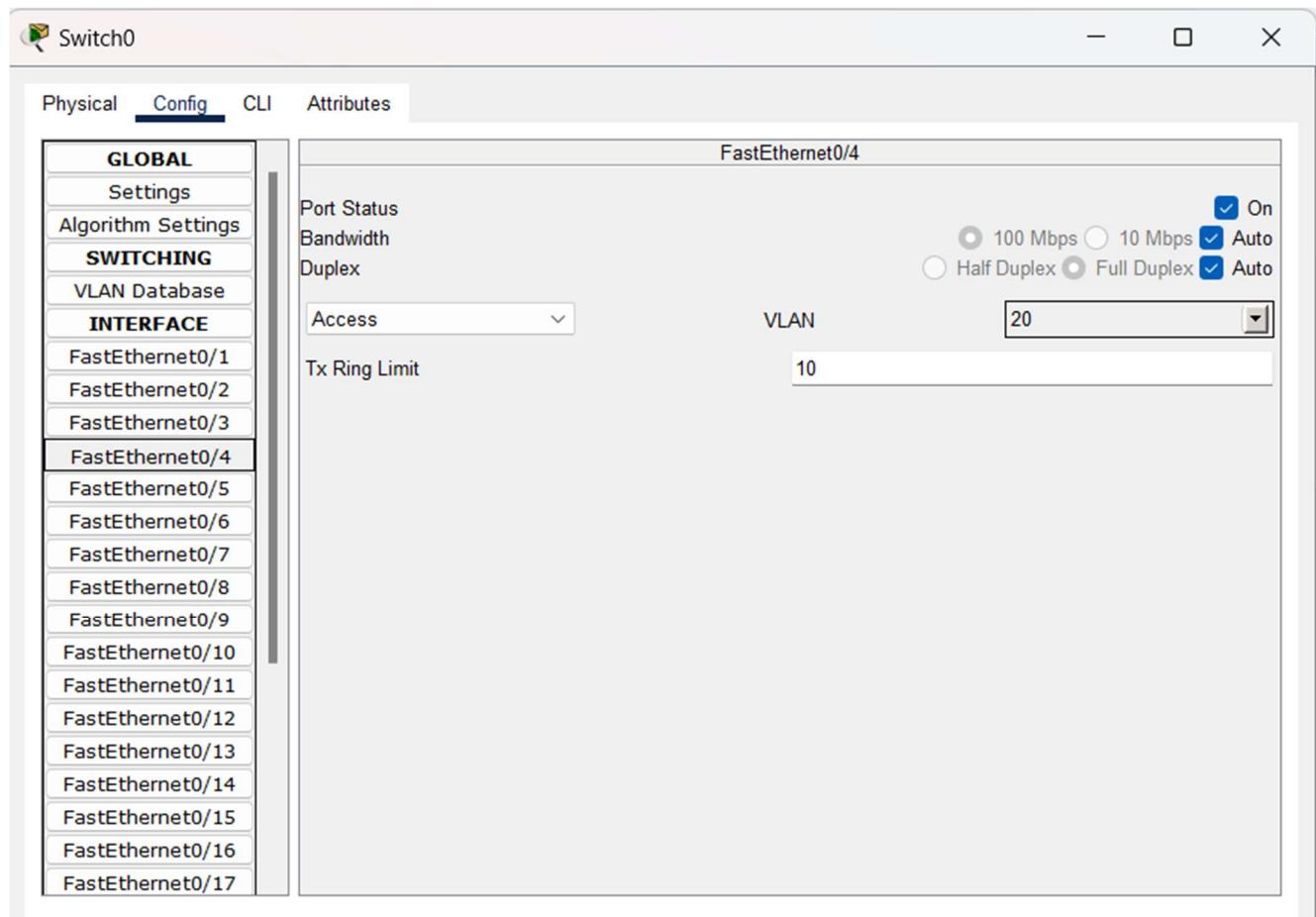
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3. VLAN_3:





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3.1 Steps To Create VLAN

1. Add Devices in Workspace

- Drag and drop 2 switches (2960/2950) into workspace.
- Add 8 PCs into the workspace.
- Divide them into 2 groups:
 - **VLAN 1** → 4 PCs
 - **VLAN 2** → 4 PCs
- Connect PCs to switches using **Straight-Through cables**.
- Connect the two switches together using a **Crossover cable**.

2. Assign IP Addresses to PCs

Go to each PC → Desktop → IP Configuration and assign IP addresses:

- VLAN 1
 - PC0 → 192.168.1.2 / 255.255.255.0
 - PC1 → 192.168.1.3 / 255.255.255.0
 - PC2 → 192.168.1.6 / 255.255.255.0
 - PC3 → 192.168.1.7 / 255.255.255.0



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- VLAN 2
 - PC4 → 192.168.1.4 / 255.255.255.0
 - PC5 → 192.168.1.5 / 255.255.255.0
 - PC6 → 192.168.1.8 / 255.255.255.0
 - PC7 → 192.168.1.9 / 255.255.255.0

Add labels to each PC to display its IP address.

3. Create VLANs on Each Switch

For each switch → Config tab → VLAN Database:

- VLAN 10 → Name: VLAN_1 → Add.
- VLAN 20 → Name: VLAN_2 → Add.

Repeat on both Switches.

4. Assign Ports to VLANs

For each switch → Config tab → select Interface (FastEthernet) → assign VLAN.

- **Switch0 Example:**
 - Port F0/1 → VLAN 1 (PC0 – 192.168.1.2)
 - Port F0/2 → VLAN 1 (PC1 – 192.168.1.3)
 - Port F0/3 → VLAN 2 (PC4 – 192.168.1.4)
 - Port F0/4 → VLAN 2 (PC5 – 192.168.1.5)
- **Switch1 Example:**
 - Port F0/1 → VLAN 1 (PC2 – 192.168.1.6)
 - Port F0/2 → VLAN 1 (PC3 – 192.168.1.7)
 - Port F0/3 → VLAN 2 (PC6 – 192.168.1.8)
 - Port F0/4 → VLAN 2 (PC7 – 192.168.1.9)

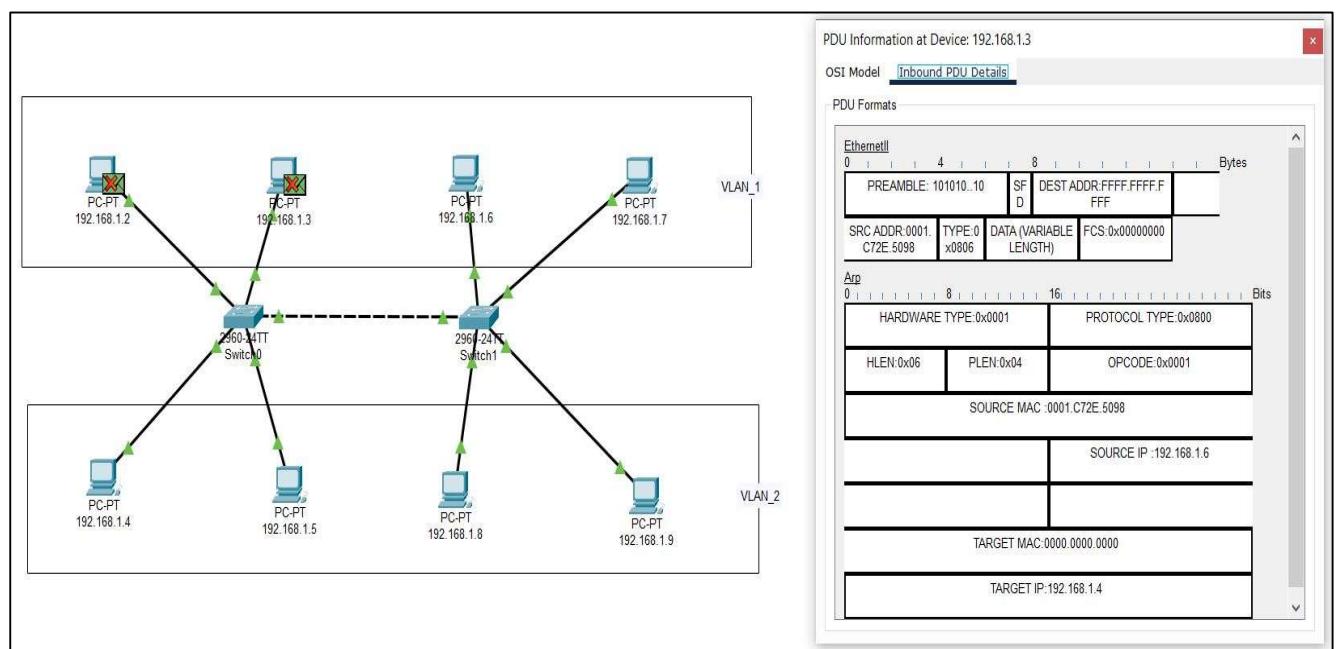
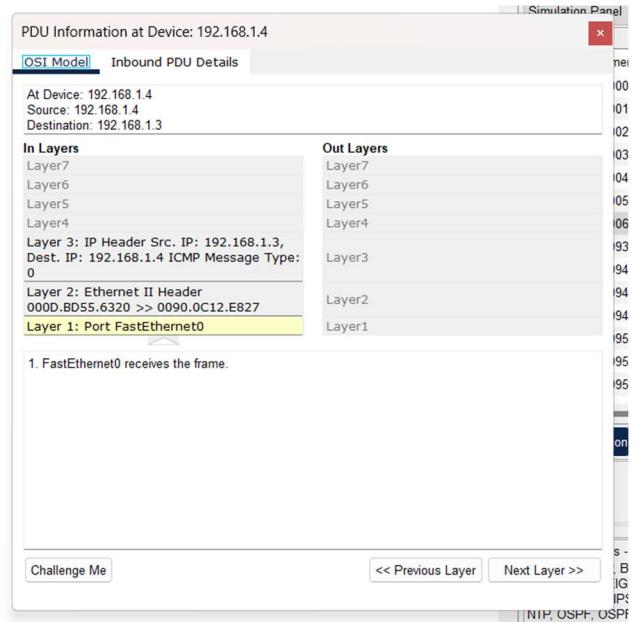
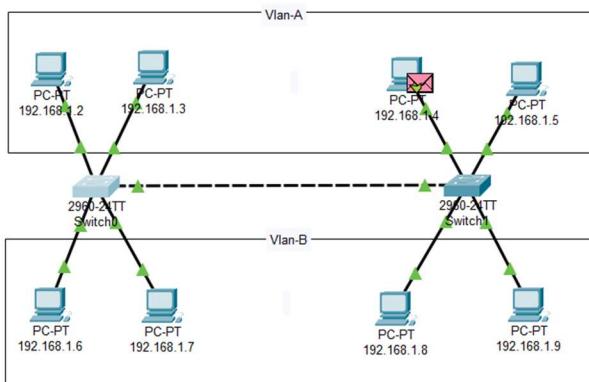
5. Configure Trunk Link Between Switches

- For the interface connecting Switch0 ↔ Switch1 → set to **Trunk mode**.
- This allows both VLAN 1 and VLAN 2 traffic to pass across switches.

6. Test VLAN Connectivity

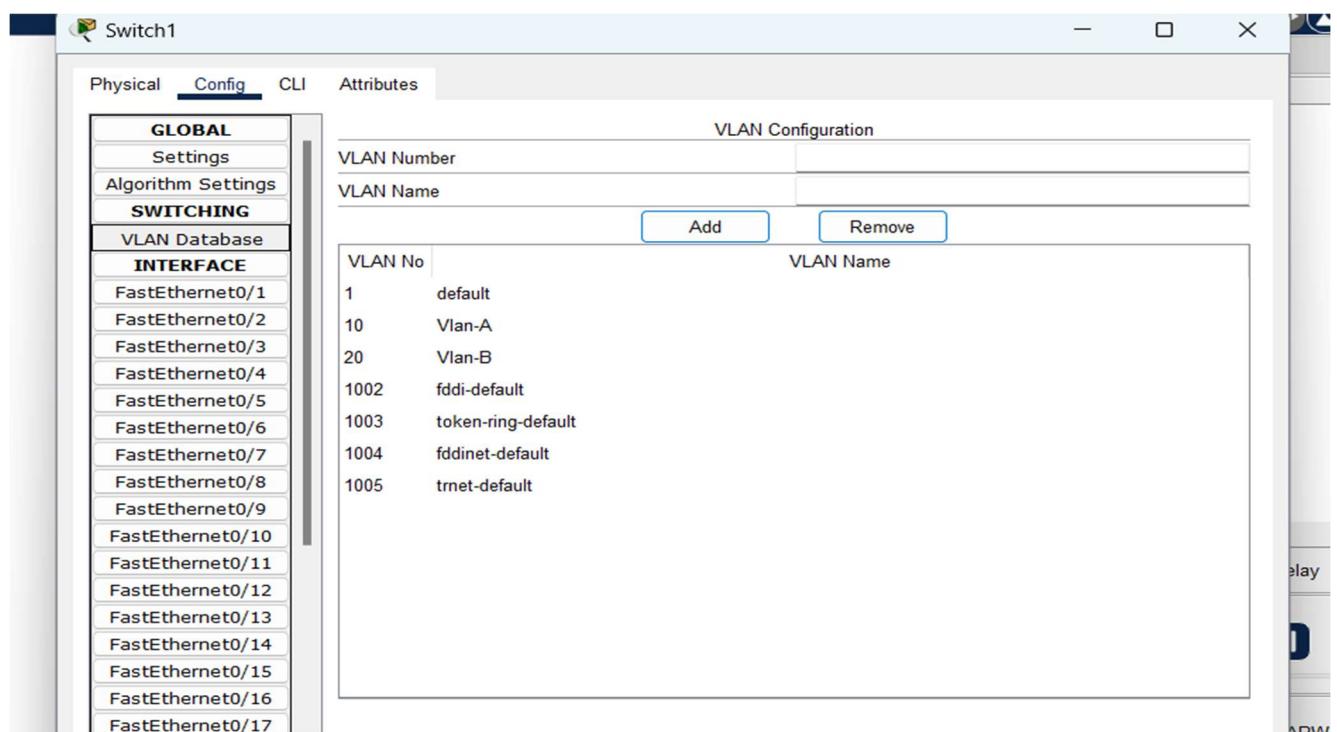
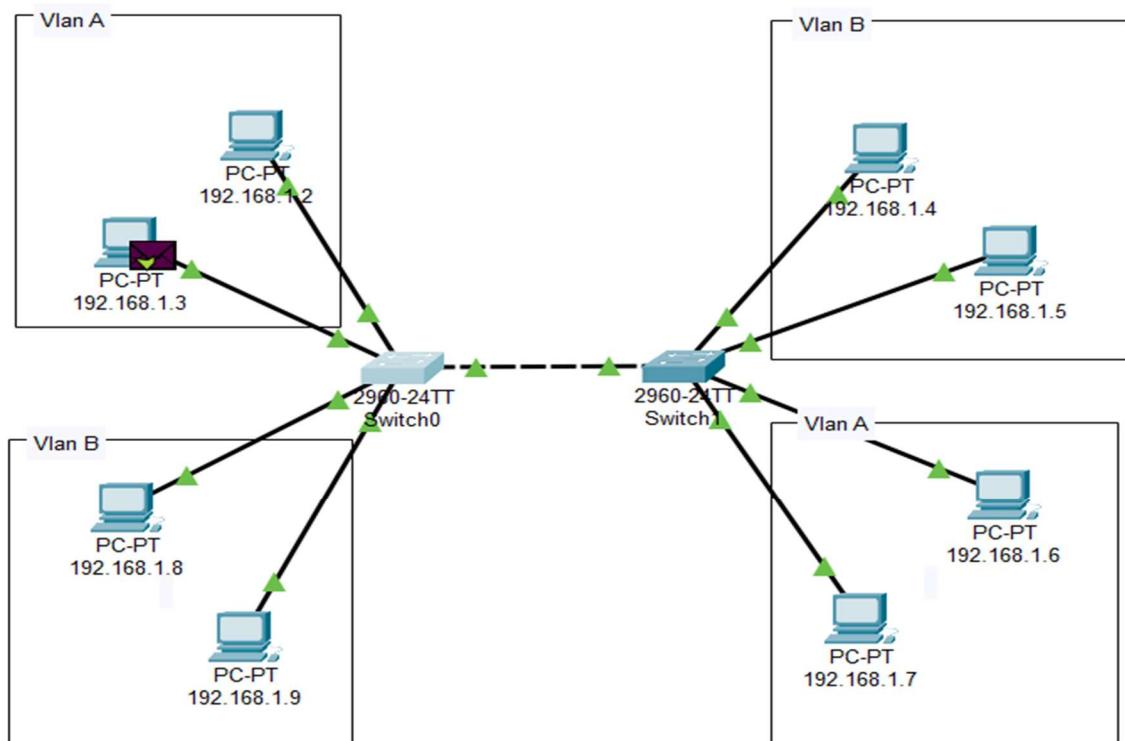
- Open **Command Prompt** on a PC.
- Ping another PC in the **same VLAN** → should succeed.
- Ping a PC in a **different VLAN** → should fail.

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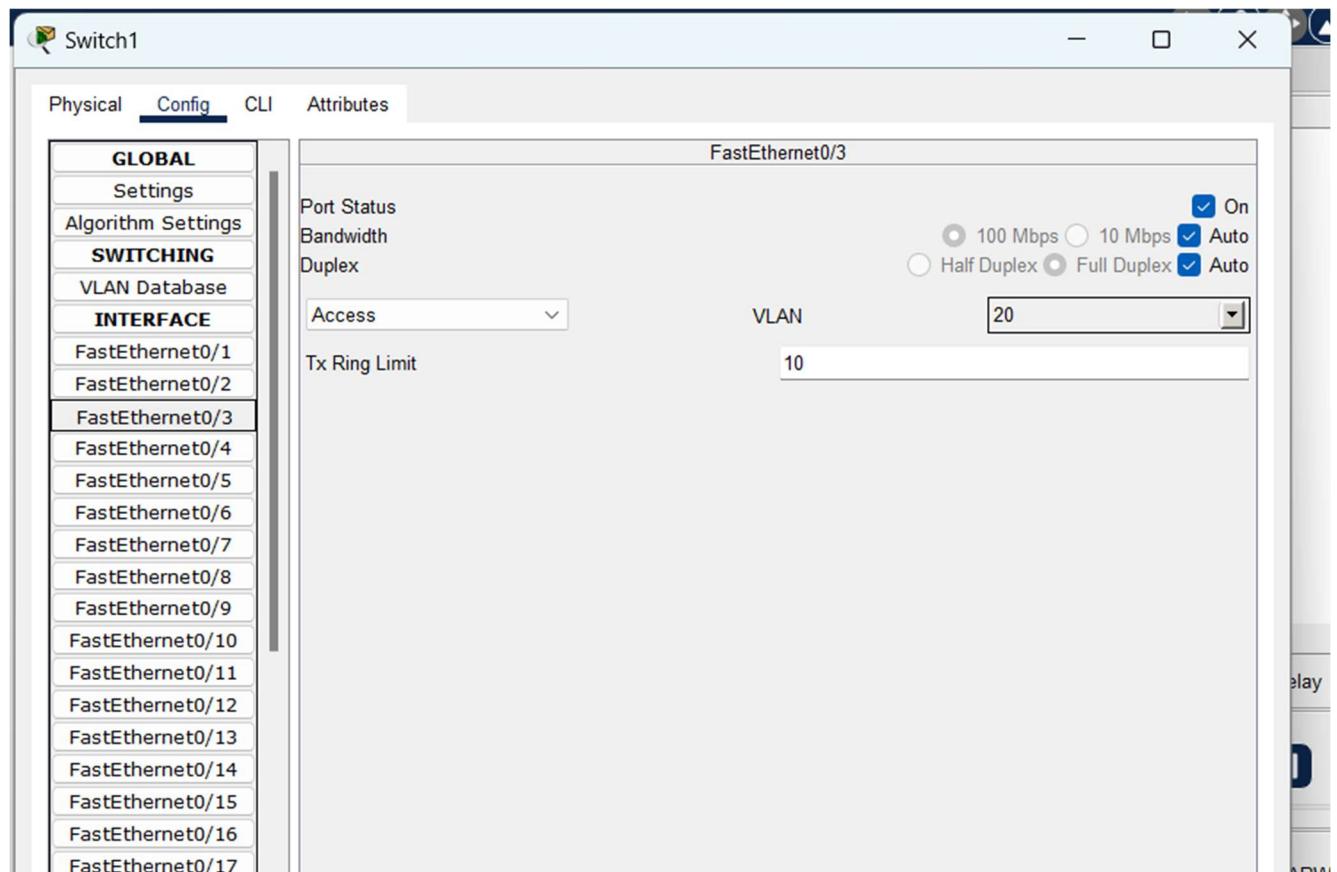


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4. VLAN_4:



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4.1 Steps To Create VLAN

1. Add Devices in Workspace

- Drag and drop **2 switches (2960-24TT)** into the workspace.
- Add **8 PCs** and arrange them into 2 groups:
 - **VLAN 1 group** → 4 PCs
 - **VLAN 2 group** → 4 PCs
- Connect PCs to switches using **Straight-Through cables**.
- Connect **Switch0 ↔ Switch1** using a **Crossover cable**.

2. Assign IP Addresses to PCs

Configure each PC → Desktop → IP Configuration:

- VLAN 1
 - PC0 → 192.168.1.2 / 255.255.255.0
 - PC1 → 192.168.1.3 / 255.255.255.0
 - PC6 → 192.168.1.8 / 255.255.255.0
 - PC7 → 192.168.1.9 / 255.255.255.0
- VLAN 2



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- PC2 → 192.168.1.6 / 255.255.255.0
- PC3 → 192.168.1.7 / 255.255.255.0
- PC4 → 192.168.1.4 / 255.255.255.0
- PC5 → 192.168.1.5 / 255.255.255.0

Add **labels** to each PC to display its IP Address.

3. Create VLANs on Each Switch

Click on each switch → **Config tab** → **VLAN Database**:

- VLAN 1 → Name: VLAN_1 → Add.
- VLAN 2 → Name: VLAN_2 → Add.

Do this on both Switch0 and Switch1.

4. Assign Ports to VLANs

- **Switch0:**

- Port F0/1 → VLAN 1 (PC0 – 192.168.1.2)
- Port F0/2 → VLAN 1 (PC1 – 192.168.1.3)
- Port F0/3 → VLAN 2 (PC2 – 192.168.1.6)
- Port F0/4 → VLAN 2 (PC3 – 192.168.1.7)

- **Switch1:**

- Port F0/1 → VLAN 2 (PC4 – 192.168.1.4)
- Port F0/2 → VLAN 2 (PC5 – 192.168.1.5)
- Port F0/3 → VLAN 1 (PC6 – 192.168.1.8)
- Port F0/4 → VLAN 1 (PC7 – 192.168.1.9)

5. Configure Trunk Link Between Switches

For the interface connecting **Switch0 ↔ Switch1**:

- Select the interface (e.g., FastEthernet 0/24).
- Set **Mode** → **Trunk**.
- This allows VLAN 1 & VLAN 2 traffic to pass across switches.

6. Test VLAN Connectivity

- Open **Command Prompt** on a PC.
- Ping another PC in the **same VLAN** → should be successful.
- Ping a PC in a **different VLAN** → will fail.

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