**Lab 4: Configuring and Verifying VLANs**

**🎯 Objective**

* Create VLANs on a switch
* Assign switch ports to VLANs
* Verify VLAN configuration
* Understand how VLANs segment broadcast domains

**🧱 Lab Topology**

lua

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PC1 --- Switch1 --- PC2

PC3 --- Switch1 --- PC4

We'll group:

* PC1 and PC2 into **VLAN 10**
* PC3 and PC4 into **VLAN 20**

All devices are connected to the same switch, but traffic between VLANs **won’t flow** without routing.

**🌐 IP Addressing Plan**

| **Device** | **Port** | **IP Address** | **Subnet Mask** | **VLAN** |
| --- | --- | --- | --- | --- |
| PC1 | Fa0/1 | 192.168.10.1 | 255.255.255.0 | 10 |
| PC2 | Fa0/2 | 192.168.10.2 | 255.255.255.0 | 10 |
| PC3 | Fa0/3 | 192.168.20.1 | 255.255.255.0 | 20 |
| PC4 | Fa0/4 | 192.168.20.2 | 255.255.255.0 | 20 |

**🛠 Step-by-Step Configuration**

**🔹 1. Configure PC IP Addresses**

**On each PC:**  
Go to **Desktop → IP Configuration**

Assign:

* IP Address
* Subnet Mask (255.255.255.0)
* Leave Gateway blank (no router yet)

**🔹 2. Create VLANs on Switch**

bash

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Switch> enable

Switch# configure terminal

Switch(config)# vlan 10

Switch(config-vlan)# name HR

Switch(config)# vlan 20

Switch(config-vlan)# name IT

Switch(config)# exit

**🔹 3. Assign Ports to VLANs**

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Switch(config)# interface range fa0/1 - 2

Switch(config-if-range)# switchport mode access

Switch(config-if-range)# switchport access vlan 10

Switch(config)# interface range fa0/3 - 4

Switch(config-if-range)# switchport mode access

Switch(config-if-range)# switchport access vlan 20

**🔹 4. Verify VLAN Configuration**

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Switch# show vlan brief

You should see:

swift

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VLAN Name Status Ports

---- -------------------------------- --------- ---------------------

1 default active ...

10 HR active Fa0/1, Fa0/2

20 IT active Fa0/3, Fa0/4

**🔹 5. Test Connectivity**

* **PC1 ↔ PC2** (VLAN 10) should ping ✅
* **PC3 ↔ PC4** (VLAN 20) should ping ✅
* **PC1 ↔ PC3** (Different VLANs) ❌ will **fail** (as expected)

**🔍 Optional: Use show Commands**

| **Command** | **What it Shows** |
| --- | --- |
| show vlan brief | VLAN IDs, names, ports assigned |
| show interfaces switchport | Port mode and VLAN assignment |
| show mac address-table | Learned MACs per port/VLAN |

**🎓 What You Learned**

* VLANs logically segment a network at Layer 2
* Devices in different VLANs can’t communicate without a Layer 3 device
* Ports must be set to **access mode** for VLAN assignment
* VLANs reduce broadcast domains

**✅ Summary Checklist**

| **Task** | **Done?** |
| --- | --- |
| Created VLANs | ✅ |
| Assigned ports to VLANs | ✅ |
| Configured PC IPs | ✅ |
| Verified VLANs (show vlan) | ✅ |
| Tested intra-VLAN ping | ✅ |
| Confirmed inter-VLAN failure | ✅ |

**Output**

Switch#sh vlan br

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 HR active Fa0/1, Fa0/2

20 IT active Fa0/3, Fa0/4

1002 fddi-default active

1003 token-ring-default active

1004 fddinet-default active

1005 trnet-default active

Switch#

Switch#

Switch#sh mac add

Switch#sh mac address-table

Mac Address Table

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Vlan Mac Address Type Ports

---- ----------- -------- -----

10 0060.3e7c.a5ac DYNAMIC Fa0/2

10 00e0.f717.2653 DYNAMIC Fa0/1

Switch#sh mac address-table

Mac Address Table

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Vlan Mac Address Type Ports

---- ----------- -------- -----

10 0060.3e7c.a5ac DYNAMIC Fa0/2

10 00e0.f717.2653 DYNAMIC Fa0/1

20 0003.e437.ed85 DYNAMIC Fa0/4

20 00d0.ff5a.4d93 DYNAMIC Fa0/3

Switch#

Switch#