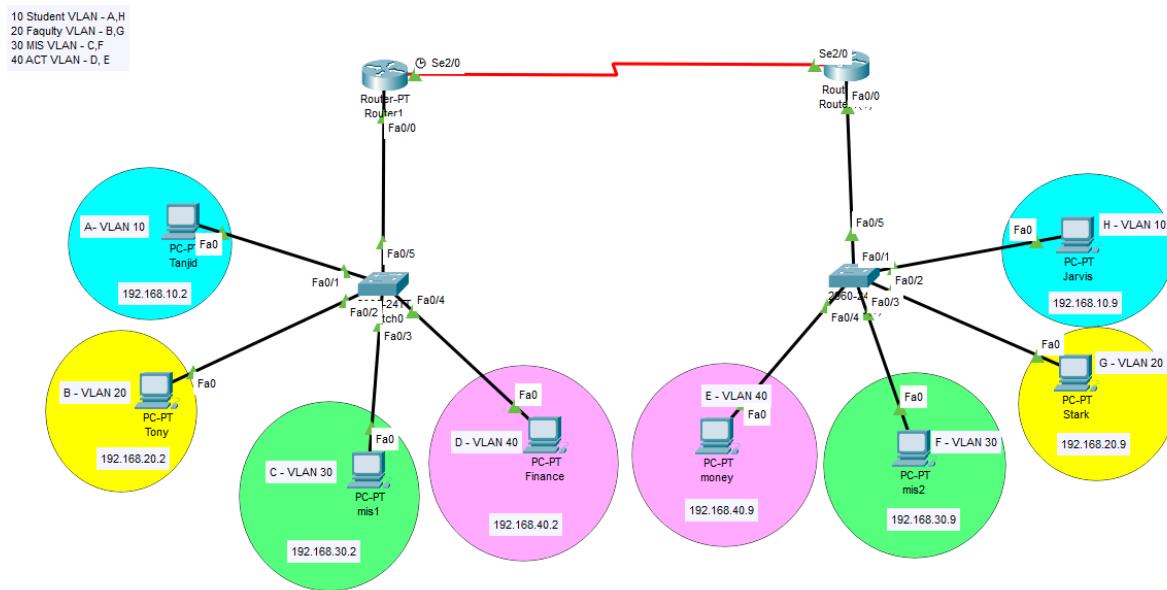


Lab Report: VLAN Configuration

1. Objectives

1. Implement a multi-site network topology using Cisco Packet Tracer.
2. Create VLANs for logical network segmentation.
3. Configure Inter-VLAN Routing via Router-on-a-Stick (ROAS).
4. Connect remote LANs via a serial WAN link.
5. Configure static routing for full cross-site connectivity.
6. Verify network functionality via ping tests and routing tables.

2. Network Topology



3. IP Addressing Assignment

Site 1 (Left LAN)

Device	VLAN	IP Address	Subnet	Gateway
R0 - Fa0/0.10	Student	192.168.10.1	/29	N/A
R0 - Fa0/0.20	Faculty	192.168.20.1	/29	N/A
R0 - Fa0/0.30	MIS	192.168.30.1	/29	N/A
R0 - Fa0/0.40	Accounting	192.168.40.1	/29	N/A
Tanjid	Student	192.168.10.2	/29	192.168.10.1
Tony	Faculty	192.168.20.2	/29	192.168.20.1
mis1	MIS	192.168.30.2	/29	192.168.30.1
Finance	Accounting	192.168.40.2	/29	192.168.40.1

Site 2 (Right LAN)

Device	VLAN	IP Address	Subnet	Gateway
R1 - Fa0/0.10	Student	192.168.10.9	/29	N/A
R1 - Fa0/0.20	Faculty	192.168.20.9	/29	N/A
R1 - Fa0/0.30	MIS	192.168.30.9	/29	N/A
R1 - Fa0/0.40	Accounting	192.168.40.9	/29	N/A
Jarvis	Accounting	192.168.40.10	/29	192.168.40.9
Stark	MIS	192.168.30.10	/29	192.168.30.9
mis2	Faculty	192.168.20.10	/29	192.168.20.9
money	Student	192.168.10.10	/29	192.168.10.9

WAN(Wide Area Network) Link

Interface	IP Address	Subnet
R0 - Se2/0	10.0.0.1	/30
R1 - Se2/0	10.0.0.2	/30

4. Configuration Overview

4.1 Switches

```

vlan 10 name Student
vlan 20 name Faculty
vlan 30 name MIS
vlan 40 name Accounting

interface Fa0/1
  switchport mode access
  switchport access vlan 10
interface Fa0/2
  switchport mode access
  switchport access vlan 20
interface Fa0/3
  switchport mode access
  switchport access vlan 30
interface Fa0/4
  switchport mode access
  switchport access vlan 40
interface Fa0/5
  switchport mode trunk

```

Verify Switch Configuration:

Commands Used: `show vlan brief`

```

Switch>show vlan brief

VLAN Name                               Status    Ports
---- ----
1   default                             active    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  student                            active    Fa0/1
20  faculty                            active    Fa0/2
30  mis                                active    Fa0/3
40  act                                active    Fa0/4
1002 fddi-default                      active
1003 token-ring-default                active
1004 fddinet-default                  active
1005 trnet-default                    active

```

4.2 Routers

R0 Example:

```
interface Fa0/0.10
  encapsulation dot1q 10
  ip address 192.168.10.1 255.255.255.248
interface Fa0/0.20
  encapsulation dot1q 20
  ip address 192.168.20.1 255.255.255.248
interface Fa0/0.30
  encapsulation dot1q 30
  ip address 192.168.30.1 255.255.255.248
interface Fa0/0.40
  encapsulation dot1q 40
  ip address 192.168.40.1 255.255.255.248

interface Serial2/0
  ip address 10.0.0.1 255.255.255.252
  clock rate 64000
  no shutdown

  ip route 192.168.10.8 255.255.255.248 10.0.0.2
  ip route 192.168.20.8 255.255.255.248 10.0.0.2
  ip route 192.168.30.8 255.255.255.248 10.0.0.2
  ip route 192.168.40.8 255.255.255.248 10.0.0.2
```

Verify Router Configurations

Commands Used: `show ip route`

```

Gateway of last resort is not set

      10.0.0.0/30 is subnetted, 1 subnets
C        10.0.0.0 is directly connected, Serial2/0
      192.168.10.0/29 is subnetted, 2 subnets
C        192.168.10.0 is directly connected, FastEthernet0/0.10
S          192.168.10.8 [1/0] via 10.0.0.2
      192.168.20.0/29 is subnetted, 2 subnets
C        192.168.20.0 is directly connected, FastEthernet0/0.20
S          192.168.20.8 [1/0] via 10.0.0.2
      192.168.30.0/29 is subnetted, 2 subnets
C        192.168.30.0 is directly connected, FastEthernet0/0.30
S          192.168.30.8 [1/0] via 10.0.0.2
      192.168.40.0/29 is subnetted, 2 subnets

```

5. Testing & Verification

Fire	Last Status	Source	Destination	Type	Color	Time(sec)	Periodic	Num	Edit	Delete
Successful	Tanjid	Jarvis		ICMP		0.000	N	0	(edit)	(delete)
Successful	Tony	Stark		ICMP		0.000	N	1	(edit)	(delete)
Successful	mis1	mis2		ICMP		0.000	N	2	(edit)	(delete)
Successful	money	Finance		ICMP		0.000	N	3	(edit)	(delete)

6. Conclusion

- VLANs were successfully implemented to segment traffic.
- Router-on-a-Stick enabled inter-VLAN routing.
- Static routes allowed full connectivity between both sites over WAN.
- End-to-end connectivity verified across all VLANs and sites.