



# DIVINE WORD COLLEGE OF CALAPAN

## SCHOOL OF INFORMATION AND TECHNOLOGY

### DATA COMMUNICATION AND NETWORKING 2

#### EXERCISE 8

NAME \_\_\_\_\_  
ID# \_\_\_\_\_

SCORE \_\_\_\_\_ RATING \_\_\_\_\_ %  
COURSE \_\_\_\_\_ DATE \_\_\_\_\_

#### LEGACY INTER-VLAN ROUTING

##### Objectives

1. Configure VLANs and assign them to switch ports.
2. Implement trunking between switch and router (Router-on-a-Stick).
3. Configure router subinterfaces for each VLAN.
4. Verify inter-VLAN communication using legacy routing method.
5. Troubleshoot misconfigurations in VLAN and subinterface setup.

##### Topology

In this activity, you will create a network with **one switch (S1)** connected to **one router (R1)** and multiple PCs.

1. PCs: PC1, PC2, PC3, PC4
2. VLANs to be created:
  - a. VLAN 10: Faculty
  - b. VLAN 20: Students
  - c. VLAN 30: Admin
3. Management VLAN: VLAN 99

##### Distribution

1. S1:
  - a. F0/2 → PC1 (VLAN 10)
  - b. F0/3 → PC2 (VLAN 20)
  - c. F0/4 → PC3 (VLAN 30)
  - d. F0/5 → PC4 (VLAN 30)
2. S1 F0/1 → R1 G0/0 (Trunk link)

##### Router Subinterface IP Assignments:

1. R1 G0/0.10 → 192.168.10.1/24
2. R1 G0/0.20 → 192.168.20.1/24
3. R1 G0/0.30 → 192.168.30.1/24
4. Management VLAN (99) on S1: 192.168.99.1/24

##### Task

1. Basic Switch Settings
  - a. Set hostname: S1
  - b. Configure console password: cisco
  - c. Configure vty 0–4 password: class
  - d. Encrypt all passwords
  - e. Configure history size to 20 commands
  - f. Save configuration
2. VLAN Configuration (on Switch S1)
  - a. Create VLANs 10, 20, 30, 99
  - b. Assign access ports:
    - a. F0/2 → VLAN 10

- b. F0/3 → VLAN 20
- c. F0/4, F0/5 → VLAN 30
- c. Assign VLAN 99 as management VLAN with IP 192.168.99.1/24
- 3. Trunk Configuration (Switch-Router Link)
  - a. Configure F0/1 (S1) as trunk port
  - b. Allow VLANs 10, 20, 30, 99
  - c. Set native VLAN to 99
- 4. Router Subinterface Configuration (R1)
  - a. Configure G0/0.10 with encapsulation dot1q 10, IP 192.168.10.1/24
  - b. Configure G0/0.20 with encapsulation dot1q 20, IP 192.168.20.1/24
  - c. Configure G0/0.30 with encapsulation dot1q 30, IP 192.168.30.1/24
  - d. Configure G0/0.99 with encapsulation dot1q 99 native, IP 192.168.99.254/24
- 5. Connectivity Test
 

Test ping:

  - a. PC1 → 192.168.10.10/24, Gateway 192.168.10.1
  - b. PC2 → 192.168.20.10/24, Gateway 192.168.20.1
  - c. PC3 → 192.168.30.10/24, Gateway 192.168.30.1
  - d. PC4 → 192.168.30.11/24, Gateway 192.168.30.1

### **Documentation (Required Screenshots)**

1. VLAN creation (show vlan brief).
2. Trunk configuration (show interfaces trunk).
3. Router subinterfaces (show running-config)
4. Successful inter-VLAN ping results
5. Troubleshooting if errors occur

### **Rubric**

<b>Criteria</b>	<b>Description</b>	<b>Points</b>	<b>Score</b>
Topology Setup & Cabling	Correct cabling between switch, router, and PCs	10	
Basic Switch Configuration	Hostname, passwords, history size, save command	8	
VLAN & Port Assignments	VLAN creation, port assignments, management VLAN setup	10	
Trunk & Router Subinterfaces	Correct trunk setup and router-on-a-stick configuration	12	
Connectivity Test	Successful pings across VLANs	5	
Documentation	Screenshots, verification commands, organized logs	5	
<b>Total</b>		<b>50</b>	