4. INTER-VLAN ROUTING

NETWORKING TECHNOLOGIES– v1.2025

A. OVERVIEW

1. Learning objective

Students will demonstrate practical proficiency in implementing VLAN technologies through direct configuration and testing exercises. Students will configure switch ports for specific VLAN assignments, establish and verify trunk port connectivity between switches, and implement interl-VLAN routing.

Through guided practice scenarios and troubleshooting exercises, students will apply configuration commands to create functional VLAN architectures, verify connectivity between devices in the same and different VLANs, and diagnose common implementation issues using appropriate diagnostic tools and techniques. Students will document their configurations, demonstrate proper lab procedures, and successfully complete practical assessments that validate their ability to implement VLAN solutions in real network environments.

2. Practice Environment

- Networking simulation with Cisco Packet Tracer.

B. LAB TASKS

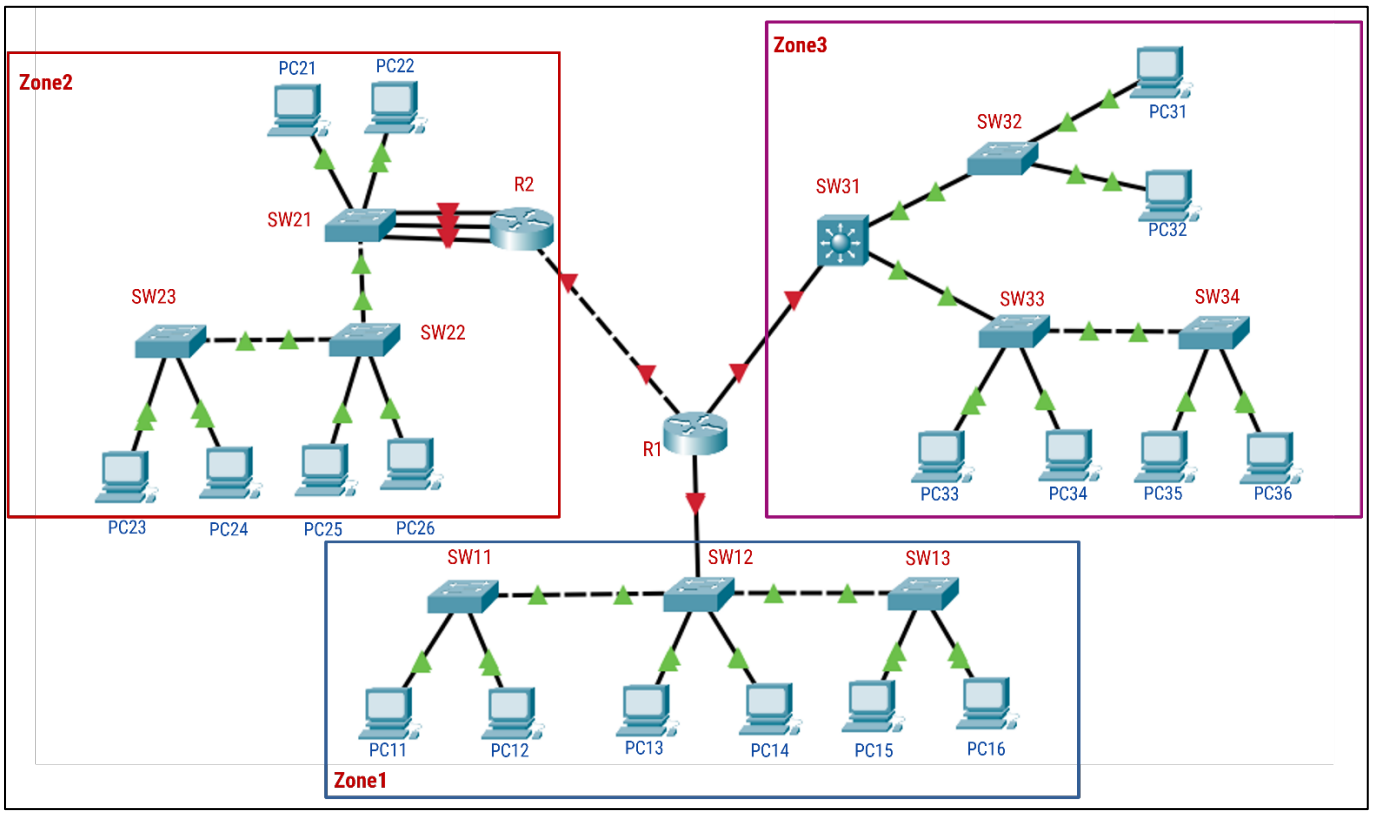

Figure 1: The network topology

Zone 1 has 4 VLANs:

- VLAN 10: 192.168.0.0/24 PC11, PC13, PC15
- VLAN 11: 192.168.1.0/24 PC12
- VLAN 12: 192.168.2.0/24 PC14
- VLAN 13: 192.168.3.0/24 PC15

Zone 2 has 3 VLANs:

- VLAN 20: 172.20.0/16 PC21, PC22, PC23, PC25
- VLAN 21: 192.21.0.0/16 PC24
- VLAN 22: 192.22.0.0/16 PC26

Zone 3 (network: 192.168.8.0/24) has 5 VLANs:

- VLAN 31: PC31, PC33, PC35
- VLAN 32: PC32
- VLAN 33:
- VLAN 34:
- VLAN 35: PC36

Requirements:

1. Configure Legacy-VLAN routing on Zone 2.
2. Configure inter-VLAN routing with Router-on-stick technique on Zone 1.
3. Configure inter-VLAN routing using Switch Layer 3 on Zone 3.
4. Routing for 3 zones: Zone 1, Zone 2, and Zone 3.

C. REQUIREMENTS

You are expected to complete all tasks in section B (Lab tasks). Advanced tasks are optional, and you could get bonus points for completing those tasks.

Your submission must meet the following requirements:

- You need to submit a **detailed lab report in .docx** *(Word Document)* format, **using the report template** provided on the UIT Courses website.
- A report written in English is required.
- When it comes to **programming tasks** *(require you to write an application or script),* please attach all source-code and executable files (if any) in your submission. Please also list the important code snippets followed by explanations and screenshots when running your application in your report. Simply attaching code without any explanation will not receive points.
- Submit work you are proud of – don't be sloppy and lazy!

  Your submissions must be your own. You are free to discuss with other classmates to find the solution. However, copying reports is prohibited, even if only a part of your report. Both reports of the owner and the copier will be rejected. Please remember to cite any source of the material (website, book,…) that influences your solution.

Notice: Combine your lab report and all related files into a single **ZIP file (.zip)**, name it as follow:

StudentID_ReportLabX.zip