Design and Simulation of a LAN for Saigon University

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***Abstract*—This thesis designs a local area network for Saigon University and demonstrates its configuration in Cisco Packet Tracer. It reviews network architecture, routing and switching concepts, then describes a topology with virtual LANs, servers, and a firewall. The simulation chapter shows configuration and checks for connectivity, web, email, and file transfer services. Screenshots also illustrate access rules between an outside network, a demilitarized server zone, and an inside network. These are observations from a simulated model; the source does not show deployment on the university production network or provide measured availability, throughput, or security outcomes. The contribution is a documented network design and configuration exercise that can inform later implementation. Physical installation, institutional validation, and operating procedures remain outside the evidence presented.**

***Index Terms*—campus LAN, Cisco Packet Tracer, VLAN, firewall, network simulation**

I. Introduction

The report considers a campus LAN as a way to connect users, departments, and shared services. It introduces basic network types and the functions of routing, switching, segmentation, and server access. Saigon University provides the organizational case for a proposed network layout. The study aims to translate those requirements into a configured model, then inspect representative communication paths. It does not claim to replace the university existing infrastructure or to report a campus deployment [1]. Earlier ICTU student work on related designs is included here for context [4], [5], [6], [7], [8]. These contextual works were selected for this English summary; they are not asserted to appear in the original thesis bibliography.

II. Methods

The author presents a topology and assigns network segments and addresses for the proposed campus setting. The design uses virtual LANs, routing, service hosts, and an outside, inside, and demilitarized zone arrangement. Configuration steps are illustrated in Cisco Packet Tracer. The practical chapter checks reachability and selected web, email, and FTP interactions, then inspects firewall access between zones. Evidence consists of topology diagrams, commands, and simulation screenshots rather than measurements from physical campus devices [1].

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III. Results

The Packet Tracer model includes configured network segments and server services. The report shows successful simulation checks for connectivity and examples of web, email, and FTP access. It illustrates FTP upload and download and the configured firewall rules affecting communication among the outside, server, and inside zones. These results support that selected paths in the proposed model were tested. They do not establish operational reliability, network performance, or security at the real Saigon University site [1].

IV. Discussion

A segmented design can clarify which users and services may communicate, and the simulated tests make configuration mistakes easier to inspect. However, a Packet Tracer result depends on modeled devices and assumptions. The report does not document physical cabling, production traffic, sustained operation, or an independent security assessment. The demonstrated firewall behavior is a configuration example, not a claim that the entire institutional network is secure. Later work would need site validation and operational testing [1].

V. Conclusion

The thesis supplies a proposed LAN architecture for Saigon University and demonstrates selected configurations in Cisco Packet Tracer. The source supports simulated network connectivity, service access, and zone-based firewall behavior through its commands and screenshots. It does not document live installation or quantitative performance. The work is therefore a design and simulation record. Real deployment would require checking the actual buildings, equipment, traffic demand, access policy, and maintenance arrangements before using the model operationally [1].

References

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