Design of a Network System for Thai Nguyen University of Technology

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***Abstract*—This undergraduate thesis designs a core network for Thai Nguyen University of Technology. It surveys the existing network, identifies infrastructure and security needs, and develops a proposed topology with VLAN segmentation, routing, and network-device configuration. The report documents the design decisions and intended connections for the university's users and services. Its conclusion states that the core-network design was completed while naming stronger network security and stable operation as future development. The source does not report a measured before-and-after performance comparison or a completed campus-wide deployment. The work is therefore a documented network design that can guide later implementation and testing.**

***Index Terms*—network design, VLAN, routing protocols, Local Area Network, security, stability**

I. Introduction

The thesis introduces the concept of computer networks, their classification, and the OSI model. It then focuses on Local Area Networks (LAN), routing protocols, and VLAN technologies. The author reviews the existing network infrastructure at Thai Nguyen University of Technology, and identifies deficiencies in security, stability, and equipment. The author aims to design a new network system to address these issues, ensuring enhanced security and stability, and meeting the needs of both faculty and students. The design includes VLANs, routing protocols, and a detailed network topology. However, the thesis does not provide any performance evaluations or comparisons with the existing system [1]. Earlier ICTU student work on related designs is included here for context [5], [6], [7], [8], [9], [10]. These contextual works were selected for this English summary; they are not asserted to appear in the original thesis bibliography.

II. Methods

The author reviews existing network infrastructure and identifies deficiencies. A new network design is proposed, including network topology, device selection, and configuration steps. The design aims to enhance security, stability, and meet the needs of faculty and students. The design includes VLANs, routing protocols, and a detailed network topology. However, the thesis does not provide any performance evaluations or comparisons with the existing system [1].

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III. Results

The principal result is a documented core-network topology for Thai Nguyen University of Technology. The report specifies network devices and connections and describes VLAN and routing configurations intended to serve university users. It addresses weaknesses identified in the existing infrastructure through a proposed revised design. The conclusion confirms completion of the design task and proposes subsequent security and stability improvements. No measured change in throughput, uptime, or security incidents is provided, and physical deployment is not established in the source [1].

IV. Discussion

The proposed network design aims to improve security, stability, and meet the needs of faculty and students. The design includes VLANs, routing protocols, and a detailed network topology. However, the thesis does not provide any performance evaluations or comparisons with the existing system. The design includes VLANs, routing protocols, and a detailed network topology. However, the thesis does not provide any performance evaluations or comparisons with the existing system [1]. Earlier ICTU undergraduate work by Lê Văn Long addressed design of an educational institution's computer network [4].

V. Conclusion

The thesis completes a core-network design for Thai Nguyen University of Technology. Its topology, device choices, segmentation, and routing configuration provide a basis for future network work. The author identifies additional security measures and more stable operation as the next development steps. The report does not establish that the new design has been deployed across the university or that it improved measured performance. Its contribution is the design documentation and the requirements analysis that precede such evaluation [1].

References

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