Design and Deployment of Network Security for Brother Industries (Vietnam) Co., Ltd. in Hai Duong

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***Abstract*—This thesis designs network-security measures for Brother Industries (Vietnam) Co., Ltd. in Hai Duong. It builds a redundant three-layer network model in Cisco Packet Tracer and configures VLANs, access-control rules, port security, a firewall, and related routing functions. The report demonstrates connectivity checks and a port-security test in the simulator. It describes DHCP snooping and IPSec VPN among the relevant protection techniques, while noting that the simulated design still lacks some desired security functions. The source does not document a production-network deployment or a measured reduction in security incidents. Its contribution is a simulated configuration and functional check for the proposed enterprise network.**

***Index Terms*—network security, VLAN, Access Control List, Firewall, IPSec VPN**

I. Introduction

The thesis focuses on designing and implementing a security solution for the network system of Brother Industries (Vietnam) Co., Ltd. in Hai Duong. It covers theoretical aspects of network security and practical implementation techniques, including VLAN, Access Control List, and Firewall. The author used Cisco Packet Tracer to model the network design and implemented several security features. The design includes a three-tier network model with redundancy, prioritizing the implementation of security policies. The author tested the system by pinging different locations and configuring port security and remote access control. However, the thesis does not report any numerical evaluations or performance metrics [1]. Earlier ICTU student work on related designs is included here for context [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 designed a three-tier network model with redundancy and prioritized the implementation of security policies. The design was modeled using Cisco Packet Tracer, and the author tested the system by pinging different locations and configuring port security and remote access control. The thesis does not report any numerical evaluations or performance metrics. The implementation included the configuration of VLAN, Access Control List, and Firewall. The author also tested the system's ability to access the internet from the internal network and verified the functionality of port security. The thesis does not provide specific performance metrics or test results [1].

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III. Results

The Cisco Packet Tracer model contains the proposed three-layer enterprise topology and configured security policies. The author reports successful connectivity checks between selected departments and a port-security check in which an unauthorized device was blocked in the simulation. The report also illustrates internal access to network services. These tests show that selected configuration rules work in the model. They do not establish the security of a live Brother Industries network, and the source identifies incomplete protection features for future work [1].

IV. Discussion

The simulated tests give useful evidence about reachability and the behaviour of selected access restrictions. The proposed segmentation, access-control lists, and firewall policies address common enterprise-network risks, but a Packet Tracer model cannot reproduce all operational traffic or threats. The source itself notes that overall security remains limited and that IPv6 and IPSec VPN configuration could be extended. Further field validation would be needed to assess the design under actual enterprise operating conditions [1].

V. Conclusion

The thesis documents a simulated network-security design for Brother Industries (Vietnam) Co., Ltd. in Hai Duong. It combines a redundant three-layer topology with VLANs, access controls, port security, and firewall configuration. Connectivity and unauthorized-device checks are demonstrated within Cisco Packet Tracer. The author identifies remaining gaps, including incomplete IPv6 and IPSec VPN configuration and the need for stronger security. The reported outcome is a tested simulation, not evidence of deployment or measured risk reduction on the company's production network [1].

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