Construction of a Network Security System for the Post and Telecommunications of Phu Tho Province Using Cisco PIX Firewall

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***Abstract*—This thesis focuses on the construction of a network security system for the post and telecommunications of Phu Tho Province, utilizing the Cisco PIX Firewall. The study emphasizes the importance of network security in the context of increasing internet usage and the need to protect information resources. It provides a detailed configuration of the firewall, including security policies and network architecture, but acknowledges limitations due to time constraints and limited practical experience. The thesis also discusses various types of network threats and attacks, such as malware and denial-of-service attacks, and presents a practical implementation of the PIX firewall in a simulated network environment. The simulated network environment was created using software tools such as WinPCap, Dynamips/Dynagen, and vpcs-0.1.**

***Index Terms*—network security, Cisco PIX Firewall, firewall configuration, network architecture, security policies**

I. Introduction

The increasing reliance on the internet and digital communication has highlighted the critical need for robust network security measures. This thesis addresses the necessity of network security in the context of post and telecommunications services in Phu Tho Province. It explores the potential threats to network security, including malware, denial-of-service attacks, and other cyber threats. The study focuses on the application of the Cisco PIX Firewall to enhance the security of the network infrastructure. The thesis acknowledges the limitations of the study, such as time constraints and the researcher's limited practical experience, which may affect the thoroughness of the implementation. [1]

II. Methods

The methods section discusses the theoretical background of network security and the practical application of the Cisco PIX Firewall. It includes the design and configuration of the firewall, as well as the setup of a simulated network environment using software tools. The thesis provides a detailed configuration of the firewall, including security policies and network architecture. The simulated network environment was created using software tools such as WinPCap, Dynamips/Dynagen, and vpcs-0.14g. The configuration details are provided, but specific performance metrics are not reported. [1]

Supervisor: ICTU Teacher 16, Thai Nguyen University of Information and Communication Technology.

III. Results

The results section presents the configuration of the network security system, including security policies, network architecture, and firewall settings. The configuration details are provided, but specific performance metrics are not reported. The thesis includes a detailed configuration of the PIX firewall, such as the setup of security policies, network interfaces, and routing. The configuration includes static and dynamic address translation, as well as access control lists. The simulated network environment was set up to test the firewall's functionality, but no measured evaluation of the system's effectiveness is provided. [1]

IV. Discussion

The discussion section evaluates the effectiveness of the network security system based on the configuration and design. It acknowledges the limitations of the study due to time and practical experience constraints. The thesis highlights the importance of continuous improvement in network security and the role of the Cisco PIX Firewall in protecting information resources. The limitations include the lack of practical experience and the absence of performance metrics to evaluate the system's effectiveness. The study suggests that further research and practical experience are needed to fully implement and evaluate the network security system. [1]

V. Conclusion

The conclusion reiterates the importance of network security and the role of the Cisco PIX Firewall in protecting information resources. It expresses gratitude to the supervisor and invites feedback for future improvements. The thesis acknowledges the limitations of the study and suggests that future research should focus on practical implementation and performance evaluation. The study provides a foundation for understanding the application of the Cisco PIX Firewall in network security and highlights the need for continuous improvement in this field. [1]

References

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