Design and Demonstration of a VPN Network for Ecomelite Technology Company

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***Abstract*—This thesis analyzes the network needs of Ecomelite Technology Company and demonstrates a virtual private network design for connections between its sites and for remote staff access. The author surveys the company's existing topology, reviews wide-area networking and tunneling options, and chooses an IPsec-based design. A laboratory topology represents the Hanoi and Thai Nguyen locations with virtual Fortinet devices. The implementation chapter documents addressing, routing, user creation, site-to-site and remote-access VPN configuration, firewall policies, and connection checks. The source states that both VPN models were configured in the demonstration. It also says that the author had limited opportunity to work on physical equipment. Therefore, the report supports a simulated or virtualized demonstration and a network proposal, not a verified production deployment in the company's live environment. It does not present throughput, latency, or security penetration measurements. The proposed extensions include grouping users by access rights and an extranet for selected customers. The contribution is a documented network design and configuration exercise with a reproducible outline for later practical evaluation.**

***Index Terms*—virtual private network, IPsec, site-to-site VPN, remote access, Fortinet, network design**

I. Introduction

The company has staff and offices that need access to resources across sites and from remote locations. The thesis examines how a virtual private network could provide protected communication over public networks. It studies the existing network and identifies a need for both branch-to-branch and individual remote access. The report distinguishes its design and laboratory demonstration from the company's operational network, since the author acknowledges limited work on physical equipment [1]. Earlier ICTU student work on related designs is included here for context [3], [4], [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 surveys the current network and compares VPN options, then selects an IPsec-based topology. Virtual Fortinet firewalls represent the Hanoi and Thai Nguyen sites. The demonstration configures interface addressing, routing, user accounts, firewall policies, site-to-site tunnels, and remote-access connections. Network diagrams, configuration screens, and connectivity checks document the procedure. The source also discusses cost and equipment needs for a future real deployment, but these estimates are not treated as measured implementation outcomes [1].

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III. Results

The report presents a proposed overall network diagram and a virtualized demonstration for site-to-site and remote-access VPN. It shows user setup and firewall policy screens and describes connection checks after configuration. The conclusion says that both VPN models were configured to a relatively complete demo level. No measured tunnel throughput, availability, or attack resistance is reported. The practical result is a configuration example and proposal, with live company deployment and long-term operations left unverified [1].

IV. Discussion

The virtualized design demonstrates how branch connectivity and remote user access can be organized around IPsec tunnels and firewall rules. It does not establish that the chosen configuration would satisfy all operational requirements on the company's actual hardware. The author notes limited experience with real devices and proposes future user access groups and a customer extranet. Before production use, the topology would require validation of authentication, policy isolation, recovery, and performance under the actual network conditions [1].

V. Conclusion

The thesis documents a network survey, a VPN topology, and a virtual demonstration of branch and remote-access connectivity for Ecomelite Technology Company. The source supports a configured laboratory example, not a fully measured production installation. Its practical next steps are real-device testing, access-policy refinement, and evaluation of an optional customer extranet. The report is useful as a design and configuration record within those limits [1].

References

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