Studying System Security and Designing a Simulated Network for POD Private Enterprise

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***Abstract*—This undergraduate thesis studies network-security measures and designs a simulated network for POD Private Enterprise. The report describes the organisation's network needs, develops a logical topology, selects network devices, and models the proposed configuration in Cisco Packet Tracer. Its simulated layout includes routed network segments, switches, servers, and firewall placement. The work also considers procurement costs and discusses availability and security requirements. The source offers a network design and simulator configuration rather than evidence of a live installation at POD. Its conclusion recommends later security and technology improvements without providing measured field outcomes.**

***Index Terms*—network design, security solutions, firewall, SMEs, Cisco Packet Tracer, logical network**

I. Introduction

POD Private Enterprise is used as the case for considering how a small organisation can connect internal users and services while protecting its network. The thesis reviews network-design requirements such as availability, security, and cost. It then develops a proposed topology for the enterprise and tests configuration ideas in a simulated setting. The aim is to demonstrate a feasible network architecture and identify measures that would require later real-world implementation and assessment [1]. Earlier ICTU student work on related designs is included here for context [2], [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 reviews the enterprise's organisational and network requirements, designs a logical topology, and selects routers, switches, servers, and firewall components. The proposed network is configured in Cisco Packet Tracer with separate segments and service placement. The report documents configuration steps and a cost estimate for equipment and installation. These methods support an architectural and simulation study. They do not constitute a measured security trial on the enterprise's operational network [1].

III. Results

The thesis presents a logical network design for POD and a Cisco Packet Tracer demonstration of its configuration. The model includes network segments, routing devices, servers, and firewall settings intended to support the enterprise's connectivity and protection requirements. The report also provides an equipment and implementation cost estimate. Its documented result is the proposed design and simulated operation, without a quantitative throughput, availability, or attack-resistance comparison against an existing production network [1].

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IV. Discussion

The proposed topology addresses the case organisation's need for a manageable network with basic security and availability. Cisco Packet Tracer is useful for checking configuration logic, but the model cannot establish performance or threat resistance under real traffic and operating practices. The source discusses stronger encryption, intrusion detection, and future technologies as possible extensions. Those measures should be treated as recommendations rather than capabilities verified by the simulated implementation [1].

V. Conclusion

The thesis delivers a documented network-security design and simulation for POD Private Enterprise. It combines a case-based requirements review, logical topology, device selection, simulator configuration, and a cost estimate. The work demonstrates design feasibility within Cisco Packet Tracer while leaving field deployment and measured security outcomes unreported. The report's suggestions for stronger protection and newer network technology provide directions for later development. The main contribution is the architecture and configuration evidence for the case enterprise [1].

References

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