Design and Simulation of a Local Area Network for Tien Phong Secondary School in Me Linh, Hanoi

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***Abstract*—This graduation project designs a local area network for Tien Phong Secondary School in Me Linh, Hanoi. The author surveys the school's networking needs, studies LAN and VLAN concepts, selects a topology and equipment, and documents an estimated implementation plan. The proposed network is modeled in Cisco Packet Tracer, where router, switch, server, and client configurations are demonstrated and connectivity is checked with ping. The result is a network design and software simulation. The source does not document physical deployment of the full LAN at the school or measured production performance, so the summary does not claim either outcome.**

***Index Terms*—Local Area Network (LAN), Network Design, Network Equipment, School Network, Network Topology**

I. Introduction

The source thesis addresses the need for information sharing and network access across the buildings and work areas of Tien Phong Secondary School. It introduces relevant LAN concepts and explains why topology, equipment, security, and cost need to be considered together. The project's objective is to propose a network that fits the school's described needs and to demonstrate its configuration in a simulator. The report should be read as a design and simulation study rather than a record of completed on-site installation [1]. Published books on the methods and subject of this project provide context for this English summary [10].

II. Methods

The author surveyed the school setting and its intended network use, reviewed LAN and VLAN technologies, and selected a topology with suitable routers, switches, servers, clients, and cabling. Device choices and estimated costs were included in the design. The network was then configured in Cisco Packet Tracer. The demonstration assigns addresses, connects simulated devices, and uses ping checks within and between building segments. This procedure tests the modeled configuration, not physical hardware in production [1].

III. Results

The thesis presents a network diagram, equipment selection, cost considerations, and a Packet Tracer model for Tien Phong Secondary School. The demo shows router, switch, server, and client configuration and reports ping checks for communication within a building segment and across segments. These outputs support the feasibility of the proposed topology within the simulated setting. No installation log or field measurements in the source establish that the complete LAN was deployed at the school [1].

IV. Discussion

The simulation makes the proposed network structure inspectable and allows basic connectivity to be checked before any physical installation. It also exposes design choices about segmentation, shared resources, and equipment. However, simulator success cannot establish real-world coverage, throughput, security, or maintenance behavior. The source itself points to the need for stronger security and further completion of the network design. Such issues would need validation during a later deployment phase [1].

V. Conclusion

The project completed a LAN proposal and demonstrated its connectivity in Cisco Packet Tracer for the Tien Phong Secondary School case. Its contribution is the combination of needs analysis, topology and equipment selection, estimated cost, and a reproducible simulation. The source supports those design outcomes, while operational results from a physical school network remain unverified. Future work should validate the design on site, strengthen security, and document measured service performance [1].

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