A Packet Tracer Simulation of an IoT Smart Home Network

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***Abstract*—This undergraduate thesis investigates an IoT smart-home network simulated in Cisco Packet Tracer. A smart home requires connected sensors and devices to exchange data and respond to user commands. The student configures a Packet Tracer smart-home model with connected devices, a central management path, and example automation such as lighting response to a sensor. The report discusses monitoring, configuration, and remote control in the simulator. The source demonstrates network and device behavior in the simulated environment. Its conclusion describes possible convenience, energy, and security benefits, but these were not measured in a physical household. No real appliance installation is reported. The author explicitly notes that simulation differs substantially from deployment. Electrical safety, device compatibility, network outages, privacy, and energy use would need testing with real hardware before drawing operational conclusions. The contribution is a documented student study or prototype whose stated scope can guide further testing.**

***Index Terms*—IoT, smart home, Packet Tracer, network simulation**

I. Introduction

A smart home requires connected sensors and devices to exchange data and respond to user commands. This thesis investigates an IoT smart-home network simulated in Cisco Packet Tracer. It begins from a practical engineering need and explains the technologies and workflow chosen for the case. The objective is to document a student implementation or comparative investigation, together with the evidence available in the manuscript. Broader operational or economic effects require separate measurements and are not assumed from the existence of a prototype [1]. Earlier ICTU student work on related designs is included here for context [2], [3], [4], [5]. Related published studies provide context for the subject and methods [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 student configures a Packet Tracer smart-home model with connected devices, a central management path, and example automation such as lighting response to a sensor. The report discusses monitoring, configuration, and remote control in the simulator. The source is summarized through its stated design, implementation material, examples, and conclusion. Features shown in the manuscript are distinguished from proposals for later development. This review does not add a new experiment, fill missing measurements with estimates, or treat a planned capability as an observed result. The source thesis remains the provenance for the reported work [1].

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III. Results

The source demonstrates network and device behavior in the simulated environment. Its conclusion describes possible convenience, energy, and security benefits, but these were not measured in a physical household. No real appliance installation is reported. The report's screens, configurations, examples, or measurements constitute the evidence for this summary. A capability described only as a design intention is not counted as a validated operational outcome. No additional performance, adoption, financial, or safety figure has been introduced here. The result is interpreted within the scope of the student's documented setup [1].

IV. Discussion

The author explicitly notes that simulation differs substantially from deployment. Electrical safety, device compatibility, network outages, privacy, and energy use would need testing with real hardware before drawing operational conclusions. Future work could implement a small physical pilot, document communication failures and access control, and compare energy use under controlled conditions. These limitations affect how the evidence should be read. The current manuscript can support understanding of the design and reported demonstration, while independent tests would be needed for stronger claims. Any later deployment should document its environment and separate observed outcomes from intended benefits [1].

V. Conclusion

The thesis documents an IoT smart-home network simulated in Cisco Packet Tracer. The source demonstrates network and device behavior in the simulated environment. Its conclusion describes possible convenience, energy, and security benefits, but these were not measured in a physical household. No real appliance installation is reported. The author explicitly notes that simulation differs substantially from deployment. Electrical safety, device compatibility, network outages, privacy, and energy use would need testing with real hardware

before drawing operational conclusions. Future work could implement a small physical pilot, document communication failures and access control, and compare energy use under controlled conditions. Accordingly, the present contribution is a source-grounded account of the student work and its tested or illustrated scope. Claims about broader effectiveness should be assessed in later work using explicit evaluation conditions [1].

References

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