CYB 5290 – Spring 2023
Project Proposal
Due: 2/19/2023 11:30PM

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Project Idea Example Picked: Develop a user interface for network packet (ARP, IP, DNS, etc.) generations. This tool can be built on top of other tools/libraries available (e.g., scapy).

1. Introduction

In this project, I seek to develop an application for network packet generation. The application will provide a simple and easy-to-use platform for generating multiple types of network packets such as ARP, IP, DNS, etc. The application will be developed using the programming language Python and the libraries PyQt, QTest, and Scapy. Scapy will provide the necessary backend functionality for packet generation. QTest will provide a way to test the application based on the requirements. I will be developing this application on a Windows operating system. The application's user interface will be designed using Figma based on the requirements documented beforehand.

2. Objectives

The main objectives of this project are as follows:

- To develop a user-friendly interface for generating network packets using Figma software.
- Provide support for generating different types of network packets, such as ARP, IP, DNS, etc.
- Use the Scapy library to create backend packet generation functionality.
- Use the PyQt library for the frontend user interface development from the design created using Figma.
- Certify the user interface is intuitive and easy to use, even for non-technical users.

3. Methodology

The following methodology will be used for this project:

- Define the requirements: I will clearly define the functional and non-functional requirements for the application, which include the types of network packets that are supported, the user interface design, and the performance requirements.
- Design the user interface: I will design the user interface (GUI) using the PyQt library and Figma design software. The design will focus on a simple and

understandable interface for the generation of network packets. I will base my design on the features mentioned in the requirements phase.

- Implement backend: I will use the Scapy library to create functions to generate various types of network packets (included in the requirements) which will be connected to the user interface later in the development process.
- Accentuate the user interface and backend together: I will integrate the user interface and the backend functionality to provide a complete user experience.
- Test and debug: I will test the application to ensure that it is functioning as expected and debug any issues that arise. I will test based on how the requirements define how the system should perform. I will perform unit and integration testing using the QTest library. I will also perform testing on the requirements themselves to make sure they are clear and there are no conflicting statements.

4. Timeline

The project timeline will be as follows:

- Week 1-2 (2/26/2023 – 2/11/2023)
  - Describe the requirements and design the user interface.
- Week 3-5 (2/12/2023 – 4/01/2023)
  - Employ the backend using Scapy and integrate it with the user interface.
- Week 6 (4/02/2023 – 4/08/2023)
  - Test and debug the application.
- Week 7 (4/09/2023 – 4/15/2023)
  - Finalize documentation and write up a report.

5. Budget

This project will be developed using open-source libraries and software so there will be no expenses other than the cost of my time.

6. Conclusion

In conclusion, this project develops a python application that allows a user to generate network packets. The design of the application will be designed using the software Figma based on the requirements documented. The application will be developed using the PyQt, Scapy, and QTest libraries, and will provide support for various types of network

packets. The application will be tested on every phase to ensure the project will be delivered on time, within budget, and with high quality.