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### Capstone Self-Assessment Essay

With every modern home having WiFi, network security is no longer a subject that concerns industrial and business networks. The average home, however, is not equipped with the software or skillset to properly defend a network. The goal of our project is to make network security more accessible for home networks by building a layer of software on top of open source router firmware. Utilizing a mobile interface, users will be able to analyse the current state of their network, accept or reject new connections, and perform other tasks crucial to network administration. Skills I have obtained throughout my college degree both through my education and my co-ops will aid the completion of this project.

This project will require three main skillsets to complete: knowledge of network security, knowledge of user interface design, and knowledge of the software development process. Throughout my coursework at the University of Cincinnati I have learned these topics and obtained these skillsets. Network and Cloud Computing (EECE 4029) and Cyber Defence Overview (CS 5155) taught the necessary networking topics to deal with network security. User interface design was taught in User Interface (CS 5167). Finally, software development was instructed in Software Engineering (EECE 3093), Data Structures (CS 2028) and Database Design (CS 4092). Attempting this project would be much more difficult had I not taken these classes.

While these classes are useful for providing the knowledge required for this project, it would be difficult to complete without experience. Having participated in UC's Co-Op program for four semesters, I have gained experience that will aid development for this senior design project. During my first two Co-Op semesters, I worked at Balluff Inc. doing a lot of work with industrial networking and web development. This experience will aid the User Interface and Network Security portions of this project. My next Co-Op at Diebold Nixdorf required me to create a Windows .NET application in addition helping test production software. Here, my abilities developing a User Interface and developing software were further improved. Finally, my time at ICR has pushed me further into the direction of Security. With the practical knowledge obtained from my Co-Ops in combination with the theoretical knowledge from classes will properly equip me to tackle this project.

My motivation for this project comes from two main sources. Firstly, my parents, who are not very technically inclined, nor do they desire to be, represent the perfect use case. Their lack of technical awareness in combination with their assets that they have acquired over many years make them the perfect target for an attack. This presents a challenge to create an application that is user friendly enough for the less technical to use while simultaneously being effective enough to protect a network from potential attackers. Further motivating me is my

desire to delve deeper into the subject of network security. This subject is an area of interest to me as it will play a prominent role in my career post-graduation.

Upon completion of this project, success will be measured not only with its functionality but in how effective users with a less technical background are at protecting a network from potential attackers. Through the applications functionality, users should be able to receive mobile notifications on new potential device connections, revoke access to foreign and suspicious devices, and view potential suspicious network activity. By having a mobile and web application, the application functionality should be accessible to virtually any device. The overall end-goal for this tool will be to abstract away the detailed technicalities while providing a more universal audience a powerful tool that provides network security.