Chase Ashby
Capstone Assessment
CS Senior Design

Covert Channel

My team's senior design project will be creating a framework for building a covert channel. This framework will allow users to quickly and easily setup a channel that they can use to communicate securely. We will then be demonstrating the function of this framework by setting up a secure website hosted on a private server and then proceed to setup the channel to communicate via the website undetected. Academically speaking I believe this is going to be a challenging project but a very good learning experience as well as a good way to demonstrate some of the skills I have learned through my curriculum.

The skills I have learned from my classes at UC will be paramount to the success of this project in many ways. I can't express how useful my experience in CS 2021 Python programming is going to be as much of our framework is going to be built using Python. I would also be remiss if I didn't talk about how import my knowledge of Computer Networks that I learned in CS 4065 will be as we will be sending data across a network. Not to mention EECE 3093C software engineering that taught me so much about setting up development environments and utilizing source control. Lastly, but certainly not least I will definitely be utilizing things I have learned in EECE 4029 OPR SYS/SYS PROG in the event that we end up using the framework to communicate via operating systems as well as what I have learned in ENGL 4092 TECH/SCI WRITING for writing up our reports comprehensively in a clear concise manner.

While my experience in school has definitely provided me with a very solid foundation for tackling the task at hand, I believe my co-op experiences have provided me with the skills I need to work in a collaborative development environment. I worked for a company called Siemens Digital Industries Software for all five of my co-op rotations as a Software Development Intern. During my time here I worked on three different teams each which provided me with a very good set of skills. My first team was working on a software called Teamcenter where I got experience working with AWS which will be useful as we will more than likely be hosting our website on their platform. On my next team I was working on developing an internal web tool for our marketing team, this experience using source control software such as github and gitlab which will be useful for keeping our project in order. The web dev team also taught me skills in task management and web dev which will come in handy for managing responsibilities with my team and building our website to setup our covert channel respectively. The third and final team I worked on was a research and development team. On this team I worked mostly independently on research projects and proof of concepts, during this time I learned how to build software from the ground up and research and implement complex topics that have little to no documentation and might not even be possible. This is going to be very useful for my project because I feel am now competent in learning new technology on the fly and finding a way to make it work despite obstacles. Overall my time with Siemens has been a fantastic learning experience that has provided me with a plethora of skill that will be very useful for my senior design project.

The reason I chose a covert channel as my project is because despite my many experiences in the world of computer science, I have not had the opportunity to work with software/network/OS

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security. I want to learn some aspect of how security vulnerabilities are exploited so that I can create more secure software and write more secure code. I really excited to work on this project mainly due to my experience in research and development. I am a very hands on learner and I think this is a great opportunity to learn about cyber security while working with it to really drive home the concepts and provide me with a robust understanding.

My team and I have take a very paced approach to this project. Starting off we setup a Pivotal account to manage and delegate tasks as well as a Github repo for source control. Next we discussed exactly what we wanted to create in terms of our framework and gathered research papers and documentation to grasp the concepts. Once we have completed our research we will begin creating individual tasks, assigning due dates, and working on building the frame work. I will keep myself in check and on progress by having my team members set reasonable due dates for tasks and monitoring my ability to achieve those deadlines. We have a pretty clear end goal which is being able to setup a covert server easily using our framework. So once we can do that we will know that we are finished. In conclusion, I'm very excited to begin working on this project and look forward to seeing and getting to show the university the end result.