Reflective Essay

David Allen

Old Dominion University

IDS 493: Electronic Portfolio Project

Professor Carin Andrews

December 5, 2025

Reflective Essay

During my time at Virginia Peninsula Community College (VPCC) and Old Dominion University (ODU), I learned valuable lessons about the technology involved in the field of Cybersecurity. Some of the main skills I learned while I was enrolled in both schools were Microsoft Office Specialist, the Linux operating system, and network design. These skills were acquired in IT and Cybersecurity courses. All skills are related to both IT and Cybersecurity disciplines, although some assignments might require research outside my field, even though the artifacts are primarily technical. This paper will discuss each skill and the corresponding artifacts in detail.

Microsoft Office Specialist

The first skill I learned was Microsoft Office Specialist. For this skill, I had to create a topic to write a research paper and complete various assignments as part of my Information literacy course. The research topic was “what are the economic effects of cyber-attacks in the technology industry?” I wanted to have a focus on the degree I was going to school for, so I started with cyber-attacks. I know cyber-attacks can cost companies a lot of money, so I chose the economic effects of cyber-attacks. My topic still wasn’t specific enough, so I chose an industry. Since I was planning on working within the technology industry, I chose it as part of my topic.

The topic I chose had a series of assignments. Some of the assignments included in Information Literacy were an Excel spreadsheet, a PowerPoint presentation, and a research paper using Microsoft Word. The Excel spreadsheet was very useful for creating an organized set of columns to display statistics about my topic. Using those statistics, I was able to convert my

tables into a line graph and a pie chart. This provides an alternative perspective for the viewer in the form of a presentable chart to easily read statistics.

Next, I made a PowerPoint presentation involving my research topic. PowerPoint presentations are great for turning long papers into slides that are easier to memorize for the viewer. They provide bullet points summaries to easily learn concepts with pictures to accompany the slides. I was able to choose a theme that would be appealing to the audience under the designs tab in PowerPoint. It's not too distracting for the viewer, but it's also not the most boring either. I went with some darker colors, black and dark red, that didn't make it too bright for the viewer. When choosing photos, I found ones relatable to each slide. For example, when talking about types of attacks, I chose a virus detected warning sign as an attack being a symbol of danger.

Lastly, I created my research paper in Microsoft Word. This showed me how to create an American Psychological Association style paper in Microsoft Word. It basically set the standard on how I write papers. Even know I see similar formats when I write papers today. The formatting was that it had to be in a 12-point font, such as Times New Roman, which is my go-to font every time I write a paper. When someone reads a paper, they want to be able to read the paper without guessing what the words are, so any type of serif font is good for a report or essay. It had to be double spaced with one-inch margins. This is to make the paper look presentable and avoid cluttering the page for the reader. A title page is given to know what the paper is about and information about the creator. Headers are used appropriately for organization, discussing cyber-attacks and examples of cyber-attacks affecting the technology industry, such as WannaCry.

Overall, this skill laid a foundation on how research should be performed and how it should be presented. When performing the research for my topic, I was introduced to Boolean

operators to narrow my search for information on my topic. I try to use scholarly articles through Google Scholar for the most reputable sources, although through my time performing research, which isn't always possible. In the IT and Cybersecurity fields, a lot of research on technology is required, even on-the-job. In order to be able to use technology, we must learn about it. This helped me get started on some basic research about technology in my field that I might run into later on. I must know what cyber-attacks are and later on I learned how to defend them. In a job setting, I might have to implement a defense solution. It might involve writing a report on how a network can be defended from certain attacks, which is discussed later. Although these are some basic research skills, it's what helped start my academic journey in college to provide higher-level work, which can be translated for even a corporate audience on technology issues and their effects from potential threats, such as a loss of money, which can be debilitating for a company depending on the attack and how long it lasts. A company might not recover for awhile if they lose a large amount of money from a cyber-attack, so being aware of attacks is important in the IT or Information Security industry.

Linux Operating System

When I arrived at ODU, I had already had some Linux knowledge from previous courses, but I never had taken a course primarily focusing on the Linux operating system. I was required to take Linux System for Cybersecurity as part of my degree requirements, which is how I learned more about the Linux operating system. Linux comes in different distributions, such as Kali Linux, which come packaged with different tools. For Kali Linux, it comes preconfigured with many security tools that help crack passwords or monitor network traffic. This course had assignments where I had to perform tasks in Kali Linux using the command line interface.

The first assignment I had for this course involved groups and user accounts. It involved creating accounts and assigning users to a group. I had to give each account a username and password. Once I did that, I assigned them to a group and created some text files. I was able to view information about each user, the groups they were in, and what files belonged to each user or group. This helped me understand the importance of having organized groups. Certain users should only be allowed access to files based on user or group ownership. An unauthorized user might be able to access files if they are assigned to the wrong group, so it's important to identify users in a group and make changes when necessary.

The second assignment I worked on was related to assigning file permissions to groups and users. Like the previous assignment, I had to create users and assign them to specific groups. Once I did that, I created directories and files with certain permissions. The three types of file permissions in Linux are read, write, and execute. If any of these permissions were assigned incorrectly to a user, unauthorized access may be granted to change the contents of a file or execute unauthorized scripts and cause security issues.

The third assignment I worked on involved automating tasks. I had to use a tool called Crontab to automate a system backup. If a user had to manually perform a system backup, that would take too long. To speed up the process, this task can be performed by a script. This script can be ran using Crontab automatically, depending on the time, day, month, and year. Once Crontab was set up, a system backup was performed. Those that work in Linux can find this highly beneficial to reduce being overwhelmed by multiple tasks. If the computer can perform a task automatically, it's one less thing that has to get done.

I enjoyed performing these assignments in Kali Linux. It has taught me about operating system security using a Kali Linux virtual machine. I always referred to class notes on command

line commands when I was stuck. I've learned about many different tools, such as Wireshark, John the Ripper, and many others, to perform security related tasks. These tasks performed and tools utilized can be useful to a Linux System Administrator. Administrators have to be able to manage operating systems throughout a company, so they might have to manage a lot of users or analyze traffic using built-in tools in the operating system. Misconfigurations can be detrimental, so being aware of how the command line is used to check settings and perform tasks is the quickest option for resolving issues.

Network Design

Before I came to ODU, I took classes that revolved around network design. I had multiple projects where I had to create a network topology and give security improvements for the design. These projects came in multiple parts, all with different security requirements. Once they were finished, the designs were highly secure networks that utilized firewalls, VPNs, access points, and other types of security technology.

The first assignment I completed was actually a final product for my class Internet/Intranet and E-Commerce Security. I had incorporated a secure three-tiered topology that was responsible for various processes, where the bottom tier was responsible for users, the middle tier was responsible for communicating data across the subnets, and the top contained firewalls and a DMZ for secure access to and from the network, depending on restrictions. We also had to provide secure remote access for remote workers and vendors, where their information resides in the DMZ, as they do not need access to the internal network.

The second assignment I completed involved implementing a network topology, addressing scheme, and application delivery for the network. The course I took for this was

called Network Communication, Security, and Authentication. Even though this was early in the project, I chose a star topology, which is easy to scale and maintain. Its weakness is that it has a central point of failure, but it can be remediated by adding a second central switch. After that, I chose an addressing scheme, IPv4, as IPv6 is still being worked and harder to transition to, although it has shown many improvements from the previous version. Applications also needed to be delivered to users on the network, so I chose a microservices option for fast delivery and high scalability.

The third assignment I completed was called Wireless and Wide Area Networking, which comes from the same course as the previous assignment. The topology had to be given a wireless component later on in the planning phase. This involved providing a diagram of the company building where I showed placement of access points for wireless communication. Access points follow 802.11 standards for their specifications. For example, one access point might work better indoors instead of outdoors, or one might have a higher signal strength than the other, so I had to choose wisely. Multiple channels have to be used to avoid disruptions in service. They also have to have multiple controllers to manage the access points and monitor traffic. Connections from the headquarters to distribution centers are also required, so two edge devices are required to maintain high availability between the headquarters and distribution centers.

These projects were very beneficial to me in learning about designing a network. At first, I thought they were going to be hard, but once I read the course textbook and performed research, I began to understand it more and liked it. I could see myself being a Network Architect maybe. There's a lot that has to be known about setting up different types of firewalls and VPNs, how nodes are placed for redundancy, and how data can be securely communicated through switches and routers. If one device goes down and isn't provided with redundancy, then an entire

network or subnetwork can go down. This has shown me how important it is to know how a network can operate as a whole and the effects of each device on a network.

Conclusion

Considering what I've learned as a whole, I've been part of excellent programs at both ODU and VPCC. Many of the courses at VPCC introduced me to computer networking and network security to prepare me for certification exams within the industry. I can say that not that many students I've ran into hold the certifications I have, unless they work in the industry already, which became more common while obtaining my degree at ODU. When I got to ODU, the experience was very similar. Some of my courses covered a lot of the same stuff at VPCC. It covered a lot about the basics of network security, such as cryptography being a topic I run into a lot.

The classes here introduced me to specializations within my field, such as Linux System for Cybersecurity, Ethical Hacking and Penetration Testing, and Information Assurance for Cybersecurity. This allowed me to take my basic knowledge and use it to learn more about specific tasks someone in the field might do. Since I am in the technical field, I also do a lot of research, so if I'm not doing a lab activity in a virtual machine, I might also be writing a research paper to showcase my knowledge about certain topics. Learning more about my field also helped me solve issues that involved other disciplines as well. I've previously included other disciplines in other papers before, but IDS 300W showed me how big of a scope Cybersecurity has with other disciplines. I've had to cover math, criminology, biology, and cybersecurity all in one paper. It's important to be an interdisciplinary thinker in this field because Cybersecurity problems might be solved with the help of other disciplines. For example, social engineering is a psychological problem that involves how an attacker might think to manipulate a person and

steal information. Technology is becoming increasingly advanced over time. Those in other fields are researching how to incorporate technology to solve world problems, such as treating diseases. Attackers might find ways to exploit new devices that lack the necessary security. Cybersecurity is going to find its place somewhere, no matter what field of study if technology is being utilized. Technology will continue to advance in various fields and require a need for security as threats evolve and find different ways to perform attacks.