Kevin Elshemy

Spring 2024

Final Report

This semester I worked under Mr. Gaona, otherwise known as JAG, for the Information Technology Department at SBU for my internship. I found this to be not only an informative and interesting experience, but one that I can look back at with fond memories. Throughout my high school and college career, I never really had an internship or job that gave me this same hands-on experience. I am usually behind my computer screen coding UI interfaces or working on projects and as a result, I felt I was missing a crucial aspect in my skillset before I was able to start my full time career. I was placed in a team environment where it was encouraged for all of us to help each other out to complete certain tasks and ask questions when we were stuck with something. This allowed me to develop my communication and teamwork skills. Every time I stepped foot into the office, I knew I was going to be able to learn something new or be able to apply what I learned previously. This internship mainly worked with the Engineering, Light Engineering, Heavy Engineering, and Old Computer Science buildings helping both undergraduate/graduate students and faculty members.

Every morning my internship began with checking the two lab rooms at the Engineering Building, Room 106 and 112. I would check all the PCs there, along with the keyboard and mouse to make sure everything was running properly so classes could function without any problems. I encountered a couple problems in those lab rooms during my routine check-ups such as an unresponsive keyboard, external speaker not displaying sound, and the projector not displaying anything. Each time I was able to solve the problem swiftly. For example, for the

unresponsive keyboard, I first unplugged the cable leading to the PC and took it back to the office for a close-up. I then plugged it into a different laptop to see if it was the keyboard or the PC causing the issue and upon noticing the keyboard was still not responding to anything, the best course of action was just to replace it.

A common task I needed to work on was setting up new PCs and installing the appropriate applications for it. To do this, I needed to first get accustomed to not only the various USB drives that carried different purposes such as fresh installs of Windows or the applications needed, but also the CEAS IT server. This server provides a way for us to access the different software needed anytime we are outside the office and working on someone's device. After a couple times of using it, I was able to understand how to navigate it and access what I needed in a timely manner. Some software that are commonly installed include Malwarebytes, Symantec, Cortex, Office 365, Ninite, Webex, Dell Command Update, etc. I also needed to become familiar with all of these software as there would be times when someone would submit a ticket detailing a problem with one of these and I would need to verify the root of the problem. Most of the time, however, I would just need to make sure all PCs were up to date with their drivers and Windows updates, as well as their applications. Another key thing when setting up new PCs was making sure they were on the Stony Brook domain. This is important because it allows us to centrally manage all the computers and enable users to log in with the same credentials across all devices. To do this we would need to go to "View advanced system settings," then click the change button next to the text that states, "To rename this computer, click Change." From there, we would give the device a unique name, such as "CEAS-TS-C1428KT" and change it from a Workgroup to a Domain. An issue we had related to the domain that I was able to fix was when one of the faculty members would get the error "Trust can't be established between user and domain" when trying

to log onto her laptop. I was able to come to the conclusion that the problem was that there was a duplicate name on the domain and the fix would be to drop it to a workgroup while disconnected from Wi-Fi, then re-add it to the domain with a different name. I was able to solve this problem by applying what I learned in previous tickets and find a workaround.

I was also able to familiarize myself with some common tools on Windows devices such as the Command Prompt and Disk Management. There was a task where there was difficulty updating Cortex on one of the workstations in the lab. This was because for some reason Cortex wasn't showing up on the device as an application that could be deleted, even though it was very clearly still running. I tried multiple ways such as going to the Add or Remove Programs setting and checking the Programs and Features tab in the Control Panel for Cortex. However, it seemed like this application just wasn't popping up. As a result, I had to use the Command Prompt and type various commands "cd C:\Program Files\Palo Alto Networks\Traps" until the application was finally able to be deleted. Disk Management was used to either extend or shrink the volume of a disk. This was something new to me at the time and with the help of JAG, I was able to understand the importance behind this and its use cases. Defragmentation was a term that he mentioned and how when files are created or modified on a hard drive, they can become fragmented or stored in different physical locations. There was a ticket where one of the PCs was running slow and not meeting its performance capabilities. As a result, I needed to go into Disk Management and look at the (C:) drive of Disk 0. In most cases, all the GB of the SSD should be allocated and used for storage, however, in this scenario, only half of the SSD storage was being allocated with the remaining half showing up as unallocated. This caused the PC to be running at half its power which explained why it was acting slow. To fix this, I needed to extend the volume of the (C:) drive.

Another key component of this internship that I was able to work on was dealing with the inner workings of the PCs, laptops, and other components. For example, there was a ticket where the person requested the SSD of his laptop to be used to extend the storage of his PC as he no longer had any use for it. As a result, I needed to unscrew the back of the laptop, locate the SSD, remove it from the laptop, and then connect it to the PC. There were also many times where I had to take off the case of the PC and either connect or replace parts of it. A situation where this occurred was when one of our team members had replaced the power supply of the PC. However, many of the cables weren't connected and the PC wasn't checked yet. As a result, I had to look at the components of the PC and plug the various cables in its proper place and make sure the power supply was hooked up and running smoothly. After doing this, I booted up the PC just to make sure everything was running before delivering it back to the person. This doesn't only go for PCs and laptops as there were times when I had to fix printers or make sure all the external components (monitor, keyboard, mouse) were all connected and working. There was a time when one of the faculty members had an issue closing the paper tray of her printer and I had to remove the tray and look inside of the printer to figure out the issue. This ended up being due to a paper jam that caused the adjustments for the paper to be raised which made the tray unable to be closed.

Lastly, I was able to work with different operating systems and the network side of things. One of the last tasks I had to do was working with Ubuntu. The problem was that upon opening the PC, instead of going straight to the home page, it would direct you to a page called GNU Grub. After working with the grub and learning its functions and what each thing did, I was able to slowly make progress with each attempt. At one point, I was able to get it to load straight to the login page every single time, with the catch being you needed to input a set of

commands into the grub to get there which is quite tedious. After a while, however, I was able to fix the issue by running a specific set of commands and installing an application called Boot Repair which scanned your device for any errors during the boot-up process. For the network side, I was constantly dealing with LANs, MAC addresses, IP addresses, etc. as these were all important in helping to configure printers or making sure the Internet was working for the devices.

During this internship, I was able to develop a multitude of computer science skills. As mentioned earlier, I was able to understand some of the fundamentals of different operating systems such as Windows and Ubuntu. I was able to learn how to navigate Command Prompt, Terminal, memory management, file systems, and to just understand where I should go for specific situations. An example of this would be Event Viewer. This was something I had never heard of before, but it was through this internship I was able to understand its value as Event Viewer can be used to get more information on certain errors you encounter such as not being to log in which can be helpful in deducing which solution is best. I was also able to troubleshoot most Windows errors as I was constantly working on different tasks that eventually a lot of these errors seemed to repeat. Moreover, I could apply certain parts of a solution to a different task as I was able to gain familiarity with many of the applications Windows provides. Another skill I was able to develop was working with PCs as I was working with the different parts of a PC that I am able to understand how each part looks and its functionality. As a result, I would say I am now quite confident in building a PC and being able to replace parts and add new parts.

The various activities I completed throughout this internship had a strong correlation with the coursework I have taken throughout my time at Stony Brook. One case would be in CSE 310, or Computer Networks, where I learned about various networking concepts such as TCP/IP,

DNS, HTTP, routing, switching, and network security protocols. One important tidbit I learned in that class was how there can't be multiple devices set to the same name within the same domain. This bit of information came full circle as one of the problems I encountered was due to the fact there was a duplicate name in the domain which caused the Wi-Fi for a particular laptop to not be able to establish a connection between the user and domain. Another would be in CSE321, or Introduction to Network Administration, where I worked with many hardware components such as servers, routers, LANs and learned about various system administration tasks such as configuring, maintaining, and troubleshooting network devices and servers. This had a correlation with what I did as I was constantly troubleshooting network devices and making sure the domain to the server was configured properly. In CSE 321, we worked with laptops and connected it to various hardware components which is similar to what I did throughout my internship. As a result, I was prepared and felt that this wasn't a foreign subject to me when I had to fix these problems myself. The last case would be in CSE 311, or System Administration, where we learned about setting up a virtual machine and managing it by configuring permissions. In this class, we were given many tasks that needed to be done on our Virtual Machine which was done using the Terminal. This experience might've been the most valuable in my internship as it familiarized me with many of the commands that I could use. For example, I learned about the command "sudo" which allows users to execute commands with elevated privileges. Another command I frequently used was "ipconfig" to check the IP address of a device. The last command I frequently used was "ls" which lists directory contents. These were only a few of the commands I learned in CSE 311 that I was able to use on a consistent basis throughout my time at the internship. This also strengthened my ability to work with the Command Prompt and Terminal as I already had experience using it in my class.

In my opinion, I found this internship experience to be invaluable in the development of my computer science skills. Not only was I able to work in a team with individuals who helped me quickly adapt and solve various tasks, but I was able to learn new things that I otherwise would've never been able to learn on my own. Having this hands-on experience allows me to get a headstart for when I start my full-time career as there will be times when I am working with various network devices or PCs and I will be able to recall some of the things I was able to take away from this internship. Furthermore, communication is a big part of working whether that be with your team members or your clients and I was able to get this experience here. There were many times where I had to meet up with a particular person that requested service and I would have to listen to them explaining the problem. I would then have to provide an explanation in a manner that they could understand while solving the issue which is quite important in the technology field as many of your clients may not be the most tech savvy. Lastly, the most important computer science skill is working on the fly and being able to adapt to any problem that may arise. This holds true at my internship as there were many times when we were given a brief explanation of the problem on the spot and needed to quickly work on figuring out a solution. Many times there would be unforeseen problems that required quick thinking to solve and I was able to get this experience while working at this internship. Overall, I feel I was able to not only learn many skills but continue to solidify the skills I gained from previous work experience and my classes.