CYSE 368 Internship Final Paper

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Hardware Assembly Technician Internship

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CYSE 368 Internship

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Table of Contents

Introduction

I decided to intern at IP Configure because I wanted to get real- world experience in the technology field, especially in an environment where I could work with hardware and systems. As a cybersecurity major, I understand that hands-on experience is important, and I wanted to challenge myself by applying what I learned in school to an actual job. This internship gave me the opportunity to work directly with servers and understand how they are built, configured, and prepared for real clients.

IP Configure is a company that focuses on video surveillance systems and server solutions. The company builds and prepares servers that are used by businesses to manage security camera systems. These systems are important for organizations that rely on surveillance for monitoring and safety. The company works with small and large clients, including businesses like Dollar Tree, Wawa and PetSmart which require reliable systems.

At the beginning of my internship, I went through orientation and started learning about the workflow. My first impression was that the company had a somewhat relaxed culture, but the work itself was fast-paced and required constant teamwork. During my first week, I felt overwhelmed because I was still learning and adjusting to the environment. Overtime, however, I became more comfortable asking questions and working with my fellow technicians.

Management Environment

The management environment at my internship is structured but not too strict. My supervisor, Sean, mainly assigns tasks, manages the scheduling, and oversees the workflow. While he does interact with us on a daily basis, he does not directly guide every step of our work. Instead, much of the guidance I receive comes from the senior technicians in the warehouse who work with me.

The support team works separately in the office, and we communicate with them when needed, especially if there are issues with servers or if we are working on service-related tasks. My supervisor is responsible for assigning which servers we work on, when to update the BIOS system, and when to prepare the servers for shipping. He also reviews our notes and tracks our progress.

I would say this management style was effective because it allowed me to become more independent. Instead of relying soley on supervision, I learned how to problem-solve and ask questions when needed. It also encouraged teamwork since I'm usually working closely with other technicians to complete tasks.

Work Duties

My main responsibilities as a Hardware Assembly Technician involved preparing, building, and shipping out the servers. Each day, we are given a number of orders that needed to be completed. That process typically includes prepping the servers, assembling the components, racking them for updates, and then boxing and shipping them out. Sometimes it would take more than one day to finish and ship out one order. Most orders that we get contain about twenty – five servers if they are being delivered to Dollar Tree, which are our usual customers.

The first step was the server preparation process which began with prepping the motherboards and organizing all the needed components. This included ensuring that all parts such as CPUs, RAM, hard drives, and cooling systems were available and in excellent condition before building. During this stage, it was important to carefully inspect each component to avoid defects or missing parts that could delay the build process.

As shown in Figure 1, a large part of my work involved preparing multiple motherboards at once, installing components such as memory and cooling systems, and making sure everything was seated and aligned properly before continuing onto the build process. This stage required a lot of care, since if I were to mishandle even a small component it could damage the system or cause it to malfunction later.

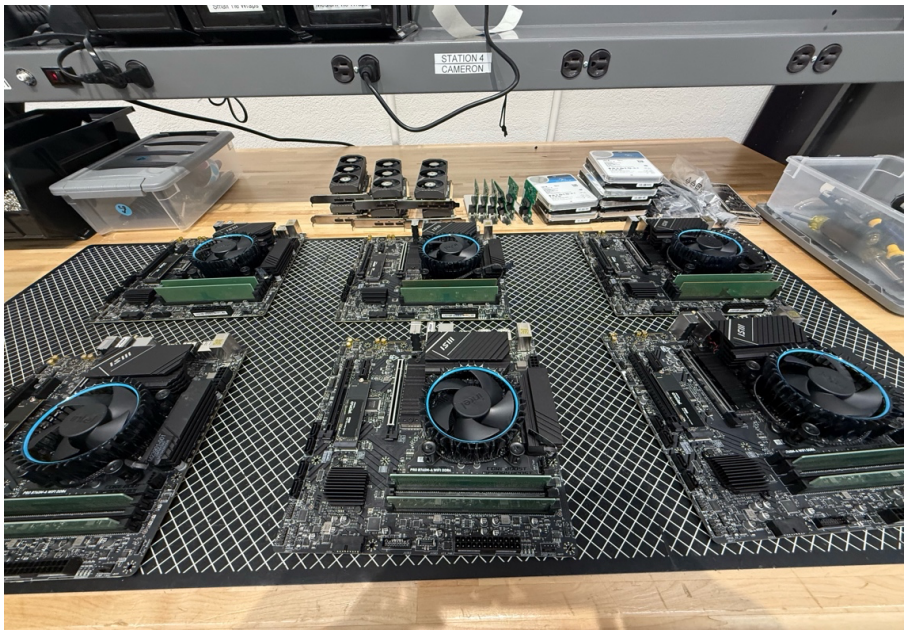

Figure 1: Example of motherboard assembly process completed during my internship at IP Configure.

After prepping the components, the next step was assembling the servers. This involved installing the motherboard into the chassis, connecting all the needed cables, and ensuring that each component was securely installed. Once assembled, the servers were placed onto the racks, where they could be powered on and configured. This process, known as racking, allowed us to update the BIOS, install operating systems, and verify that the systems were functioning correctly.

Another important responsibility was updating and configuring the servers. This included performing BIOS updates, installing operating systems such as Linux, and making sure that each system met company standards before being sent to clients. These steps were important because they ensured that the servers were fully operational and ready to be shipped out.

In addition to these tasks, we would also get smaller assignments such as assisting with support tickets when needed. These tickets involved helping retrieve camera footage or assisting with system-related issues. These tasks gave me additional exposure to how the servers are used after we build and ship them out and how the company supports its clients.

These duties are important to the company because the servers we build are directly used by clients. Any mistake we make during building or configuration could impact the client's ability to use their system. Because of this, accuracy, efficiency, and teamwork are critical in completing each project successfully.

Cybersecurity Skills

Before starting this internship, I had limited cybersecurity experience and skills. My main background was basic Linux knowledge from school and some hands-on experience from my previous job at a computer repair shop. At that job, I worked on computers, so I was familiar with hardware components like motherboards and fans, which helped me become comfortable handling delicate parts.

During the internship, I expanded my knowledge on these skills significantly. I began to use Linux more often. At ODU, I had only used Linux for assignments, but at IP Configure, I used it in a real-world environment, especially when working with Ubuntu systems. I learned how to navigate the systems better by using shortcuts, and locating the important files needed for completing the support tickets. For example, for the support team to retrieve camera footage for clients, I had to access system directories, locate stored data, and make sure the correct files were retrieved. This helped me better understand how Linux is used in actual businesses rather than just in theory that I learn in class.

I also gained a better understanding of how hardware and cybersecurity are connected. Before this internship, I mainly thought of cybersecurity as something related to networks or

software. Now, working with servers showed me that security starts at the hardware level. Making sure systems are properly assembled, updated, and configured is an important part of keeping them secure. Building servers and preparing them for shipment showed me how important it is to have them configured properly and secure before they are sent out their prospective clients. This experience helped me see cybersecurity from a more practical perspective rather than just a theoretical one.

Another important skill I developed was attention to detail. In cybersecurity, small mistakes can lead to bigger issues, and I saw that same concept apply to hardware. If a component was not installed correctly or if something was overlooked during setup, it could cause system failures or vulnerabilities. By putting just one cord in the wrong spot could cause the whole server to not power on. This experience helped me understand the importance of accuracy and consistency in both cybersecurity and IT work.

Overall, working on the job helped me retain information better because I was actively applying what I learned. I've always been a hands-on learner so by doing the same task everyday was the best way to learn. It also exposed me to new technologies and systems that I had not worked with before.

ODU Curriculum

Old Dominion University's curriculum did help prepare me in some areas like with Linux but there were also areas where I felt less prepared. I took a Linux class about a year ago, spring '25 and that gave me a foundation that I could build on during my internship. Because of that class, I was not completely unfamiliar with Linux when I started. I already understood basic commands, navigation, and system structure, which made it easier to understand and adjust. However, I do think it would have helped if I practiced more before the internship. Luckily, I was able to continue learning and improving my Linux skills on the job.

When it comes to hardware, I did not take classes at ODU that focused specifically on hardware, so I did not feel fully prepared in that area. However, in my introductory networking class, I did learn about basic components such as CPUs, motherboards, and GPUs. I understood what these components were and how they function together in a system, which gave me a helpful foundation as well.

Even though I had some basic knowledge, I think the ODU curriculum could better prepare students for internships by offering more hands-on experiences with hardware and real-world systems. They did do a good job in offering virtual labs to practice our coding skills which was helpful.

Learning Outcomes

At the beginning of my internship, I had several learning objectives that I wanted to achieve, and I believe that I met most of them.

The first objective was to develop hands-on experience with a company server hardware. Throughout my internship, I worked daily on assembling, preparing, and configuring servers. This gave me consistent, real-world experience that helped me become more comfortable over time. By the end of the internship, I was able to complete tasks by myself and with greater confidence.

The second objective was to gain a practical understanding of system security fundamentals. I achieved this by working with operating systems, updating BIOS, and ensuring that systems were properly configured before being sent to clients. These tasks helped me understand how important it is to maintain integrity and security from the very beginning of the setup process.

The third objective was to apply cybersecurity and IT infrastructure concepts. During my internship, I followed company procedures to ensure that the servers we built met quality standards. I also worked with systems that are used in real-world environments, which helped me see how the cybersecurity concepts are applied outside of the classroom.

The last objective was to strengthen my attention to detail and documentation skills. This was something I had improved some and am still working on during my internship. Because I was working with expensive and sensitive equipment, I had to be very careful and precise in everything I did. I also had to keep track of my work and communicate with my team, which helped me improve my professional skills. There are sometimes where I may miss something, but I have came a long way. While I still have more to learn, I feel that I made strong progress toward achieving my goals.

Most Motivating Aspects

One of the most motivating aspects of my internship was seeing my own improvement throughout the semester. At the beginning, I felt as though I relied heavily on others for guidance, but eventually I became more independent and confident in my abilities.

Receiving positive feedback during my each of my reviews had also motivated me. It showed me that my hard work was being recognized and encouraged me to keep going and improving.

Another motivating aspect was learning new systems, especially when we started working on more complex servers like the Wawa systems. These challenges pushed me to grow and develop new skills. Because even within those servers the motherboards were sometimes

different, and it was satisfying every time we completed a new one. It was like we had just completed a new puzzle.

Most Discouraging Aspects

One of the most discouraging aspects was the repetition at the beginning of the internship. Doing the same tasks every day made the job feel less engaging at times. Additionally, I did not receive much feedback early on, which made it difficult to know how I was performing. Though sometimes no news is good news, with as new intern and having not much prior experience I was nervous.

Another discouraging moment was when I saw my performance ranking compared to others. I was fourth out of six, which made me feel like I needed to improve. However, I had to remind myself that I was still new and that improvement takes time.

Most Challenging Aspects

One of the most challenging aspects of the internship was working with new and unfamiliar servers. Sometimes even the support team did not have clear instructions, so we had to figure things out ourselves. This required a lot of problem-solving and teamwork. With working on unfamiliar servers, it would take us longer than usual to complete. My most recent server took my two hours to build.

Another challenge was handling delicate components. It is very easy to damage parts if they are not handled carefully, which adds pressure to the job. The parts are expensive, and some aren't that easy to replace. If some parts were to break if could even delay our process because we would have to wait for the replacement and we wouldn't get it on the same day

Additionally, tasks like installing new components or updating BIOS on unfamiliar systems could be difficult and time-consuming. For example, installing a new heatsink fan took extra time because we had to figure out how it worked. The same with updating BIOS, sometimes the servers would have issues from the building stage or because of the rack and we would have to troubleshoot.

Recommendations for Future Interns

For future interns, I recommend practicing Linux before starting the internship. Having a strong foundation will make it easier to adjust to the work environment. I also recommend being open to learning and asking questions. This internship requires a lot patience and a willingness to improve as well as taking the initiative when the time comes.

Another important recommendation is to be careful when handling hardware as the components are delicate and expensive. Attention to detail is very important, and mistakes can be costly. Overall, preparing for this job is less about technical skills and more about having the right type of mindset. By being willing to learn and not getting discouraged is key to success.

Conclusion

In conclusion, my internship at IP Configure has been a very valuable and wonderful experience that helped me grow both technically and professionally. Through this opportunity, I gained hands-on experience working with many servers, improved my Linux skills, and developed a better understanding of how systems are built, configured, and maintained.

After working at this company, I realized that I want to pursue a career that combines both hardware and cybersecurity. I discovered that I enjoy working with my hands and solving problems, and I want a job where I am doing something different each day rather than repeating the same tasks. This experience helped me better understand what I am looking for in a future career.

Because of this, I spoke with my academic advisor and made some adjustments to my course schedule to better align with my interests. I am now enrolled in courses such as Ethical Hacking and Penetration Testing, as well as Enterprise Cyber Defense for the Fall ’26 semester. I believe these classes will help me build on what I learned during my internship by focusing more on security practices, defense strategies, and real-world applications. I hope that these courses will give me a deeper understanding of cybersecurity and prepare me for future opportunities.

I am very grateful that I had the opportunity to complete this internship because it gave me a clearer view of the cybersecurity field. Even though the experience was not exactly what I expected, it still provided me with real-world knowledge and helped me grow. It also changed my mindset about working in a professional environment. I learned that no one is going to hold my hand and guide me through everything, and I need to take the initiative, ask questions, and learn how to ask the right questions in order to get the answers I need.

Overall, this internship has had a strong impact on my academic and professional goals. It has helped me become more confident, more independent, and more prepared for my future career in cybersecurity.