

Final Internship Paper

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1. Introduction

Choosing an internship was one of the most challenging parts of completing my Bachelor of Science in Cybersecurity at Old Dominion University. Unlike many students who are able to relocate or dedicate an entire summer solely to work, I had several personal responsibilities that significantly influenced where I could intern. As the primary caregiver for my live-in mother-in-law, one of my greatest concerns was determining who would care for her while I fulfilled the internship requirement. Fortunately, my wife, April, is a school librarian and an Old Dominion University alumna. Because school librarians have the summer months off, she was able to assume those caregiving responsibilities while I completed my internship. Without her support, completing this internship would have been considerably more difficult.

My second challenge was geography. I live in rural Southwest Virginia, where cybersecurity internship opportunities are limited. I knew from the beginning that I would likely need to commute, but I also wanted to spend as much time with my family as possible during the summer. I began searching six months before the 2026 summer semester and reviewed opportunities across the region. Most available internships required a commute of at least forty-five minutes each way. Although I was willing to make that drive, it would have significantly reduced the time I could spend with my family and increased the strain on our caregiving responsibilities.

Instead of limiting my search to large corporations, I decided to look closer to home. Small businesses need cybersecurity just as much as large organizations, and many managed service providers (MSPs) are responsible for protecting dozens or even hundreds of clients simultaneously. That realization led me to RiverTrail Technology, a managed service provider located only fifteen minutes from my home. It quickly became apparent that this opportunity offered far more than convenience.

Before beginning the internship, I established three primary learning objectives through my Memorandum of Agreement (MOA). My first objective was to gain practical experience performing cybersecurity operations within a production environment rather than a classroom lab. While ODU provided an excellent academic foundation, I wanted to see how security principles were applied when protecting actual businesses with real-world constraints and operational requirements. My second objective was to develop a deeper understanding of how cybersecurity supports business operations and organizational risk management. Throughout my coursework, I learned that cybersecurity is not simply about deploying technical controls; it is about enabling organizations to operate securely while balancing cost, usability, and risk. Finally, I wanted to learn how security controls are evaluated against industry best practices and recognized

cybersecurity frameworks. I hoped to move beyond simply knowing what technologies exist and begin understanding why organizations choose particular security controls and how those controls are measured against established standards.

RiverTrail Technology located in Galax, Virginia, supports organizations ranging from individual residential customers to municipalities and commercial businesses, providing a diverse technology environment that would expose me to many different aspects of information technology and cybersecurity. The company's owner, Travis Haynes, has built an organization that places a strong emphasis on proactive cybersecurity, continuous improvement, and exceptional customer service. Those values aligned perfectly with what I hoped to gain from my internship.

My internship officially began with an orientation meeting involving the company's owner, Travis Haynes, and my supervisor, John Hutchins. Rather than simply assigning routine tasks, they spent time introducing me to the company and explaining how they envisioned my internship contributing to both my education and RiverTrail's ongoing cybersecurity initiatives. One of the most impressive aspects of this meeting was receiving a detailed internship guide that outlined projects and deliverables. It was immediately obvious that significant planning had gone into designing an internship that would provide meaningful educational value rather than simply assigning administrative work. That level of preparation demonstrated RiverTrail's commitment to developing future cybersecurity professionals and immediately made me feel like a valued member of the team rather than simply a student completing required hours.

2. Management Environment

One of the aspects of my internship that impressed me most was RiverTrail Technology's management philosophy. Throughout my career prior to returning to college, I had worked in organizations where management often focused heavily on oversight and strict procedures. RiverTrail operated differently. While expectations were clearly communicated, I was trusted to manage my time and seek guidance whenever necessary. That balance between independence and mentorship created an environment that encouraged learning while still providing the support needed to succeed.

My direct supervisor, John Hutchins, maintained an open-door approach throughout the internship. Whenever I encountered a technical question or wanted feedback on one of my assessments, he was always available to explain concepts or provide additional context. At the same time, he rarely gave me the answer immediately. Instead, he encouraged me to research issues independently and then discuss my conclusions. This

approach strengthened my critical thinking skills and mirrored the problem-solving process that cybersecurity professionals use daily.

3. Major Duties, Assignments, and Projects

One of the greatest strengths of my internship at RiverTrail Technology was the diversity of the work I was able to perform. Rather than spending the summer focused on a single project or observing technicians from the sidelines, I became involved in many different aspects of cybersecurity and managed IT services. My responsibilities ranged from conducting security assessments and researching emerging technologies to assisting with customer support and evaluating internal cybersecurity practices. Each project built upon the previous one, allowing me to progressively apply the knowledge I had gained through my coursework at ODU while developing practical skills that can only be learned in a professional environment.

Because RiverTrail Technology operates as a MSP, no two days were exactly alike. While I had a structured list of internship objectives, my daily schedule often changed depending on customer needs. Some mornings were spent documenting security findings or researching enterprise management solutions, while other days involved troubleshooting client issues, preparing recommendations, or participating in on-site service calls. Experiencing this variety gave me a realistic understanding of how cybersecurity professionals balance proactive security initiatives with the day-to-day operational needs of their clients.

One of my earliest assignments involved assisting with RiverTrail Technology's cybersecurity insurance compliance review. Before beginning this internship, I had very little understanding of how closely cybersecurity insurance policies are tied to an organization's technical security controls. Through this project, I learned that cyber liability insurance is much more than a financial safety net. Insurance providers often require organizations to maintain specific security controls before they will issue coverage or approve claims following a cybersecurity incident. I had always understood the importance of creating backups, but this project reinforced that backups have little value unless they are routinely tested to ensure they can actually be restored. If an organization cannot recover its data after a ransomware attack or hardware failure, the existence of backup files alone provides little protection. This project also demonstrated that cybersecurity decisions are driven by business considerations as much as technical ones. Failing to implement required security controls could potentially jeopardize insurance coverage following a cyberattack, exposing an organization to significant financial losses. That realization fundamentally changed how I view cybersecurity. Security controls are not simply technical best practices; they are business requirements that directly affect an

organization's ability to continue operating after a security incident. This assignment provided my first real exposure to cybersecurity governance and risk management and reinforced many of the concepts I had studied during my coursework.

4. Application of Cybersecurity Skills and Knowledge

My internship at RiverTrail Technology provided the opportunity to bridge that gap by applying academic knowledge to practical business challenges while simultaneously developing new technical and professional skills. Before beginning my internship, one of my greatest strengths was approaching problems from a cybersecurity perspective. Throughout my education, I learned to think critically about risk rather than simply identifying technical problems. Instead of asking whether a system functioned correctly, I naturally found myself asking whether it functioned securely. This mindset proved valuable throughout my internship because many of my assignments focused on evaluating existing security controls rather than building entirely new systems. I consistently approached each assignment by considering how an attacker might exploit weaknesses and what recommendations could reduce those risks.

While my existing knowledge served as a strong foundation, the internship also introduced me to several enterprise technologies that I had never previously encountered. One of the most significant learning experiences involved working with NinjaOne, the remote monitoring and management platform used by RiverTrail to manage client endpoints. Before this internship, I had performed vulnerability assessments and managed Windows systems individually through classroom exercises and virtual machines. NinjaOne demonstrated how those same tasks are performed across hundreds of systems simultaneously through centralized management. Instead of manually checking operating system updates, antivirus definitions, and software versions, administrators can monitor every managed endpoint through a single dashboard. Observing this level of automation fundamentally changed my understanding of enterprise cybersecurity operations because it illustrated how managed service providers efficiently support numerous organizations without sacrificing consistency or visibility.

My internship also significantly expanded my knowledge of cybersecurity governance and risk management. Prior to this experience, I understood that organizations implement security controls to reduce risk. However, I had not fully appreciated how cybersecurity decisions affect business operations until I participated in RiverTrail's cyber liability insurance review. This assignment taught me that cybersecurity is not solely a technical discipline. It also requires understanding of legal obligations, regulatory expectations and insurance requirements. These broader considerations helped me

recognize that effective cybersecurity professionals must understand both technology and business strategy.

5. How Old Dominion University Prepared Me

When I first enrolled in ODU's Cybersecurity program, I expected to learn the technical knowledge necessary to begin a career in information security. Looking back after completing my internship at RiverTrail Technology, I now realize that the program prepared me in ways that extend far beyond technical concepts. My coursework provided not only the foundational knowledge required to understand cybersecurity principles but also the problem-solving skills that proved essential throughout my internship. I found myself drawing upon lessons from nearly every course I completed during my time at ODU.

One observation that became increasingly clear throughout my internship was how frequently I recalled advice given by my professors. Many instructors emphasized that cybersecurity is a profession built upon continuous learning. I distinctly remember hearing variations of the phrase, "practice, practice, practice," throughout my coursework learning the Linux operating system. At the time, that advice seemed relatively straightforward, but my internship demonstrated exactly what they meant.

One of the strongest aspects of ODU's curriculum is its emphasis on real-world scenarios. Many assignments required students to evaluate security incidents and develop practical recommendations. Those experiences closely mirrored the work I performed at RiverTrail. Whether I was reviewing Microsoft Entra security configurations or evaluating endpoint security through NinjaOne, I approached each project using the same structured analytical process that had been reinforced throughout my coursework.

Another area where ODU prepared me well was networking and systems administration. Throughout the cybersecurity curriculum, I spent a significant amount of time studying TCP/IP networking, Windows operating systems, Active Directory, network security, virtualization, and system hardening. At the time, many of these labs were completed in isolated virtual environments where mistakes could easily be corrected by reverting to a snapshot. While those exercises may have seemed routine, they gave me the confidence to navigate enterprise environments without feeling overwhelmed.

Although ODU provided an outstanding academic foundation, my internship also highlighted several areas that simply cannot be fully taught in a classroom. Technical knowledge alone does not make someone an effective cybersecurity professional. Throughout my internship I watched experienced technicians explain complex technical problems to clients with varying levels of technical expertise. They remained calm during stressful situations, reassured frustrated customers, and translated technical terminology

into language that anyone could understand. These interactions reminded me that cybersecurity ultimately exists to serve people. Protecting technology is important, however helping people understand that technology is equally valuable. Developing those interpersonal skills required observing experienced professionals and gradually becoming more comfortable interacting with customers myself.

6. Objective Fulfillment

At the beginning of my internship, I established three learning objectives through my MOA. Looking back over my 150 hours at RiverTrail Technology, I can confidently say that each of these objectives was achieved. More importantly, the internship exceeded many of my expectations and gave me a much clearer understanding of both the cybersecurity profession and my future within it.

The three objectives I established were:

- 1. Gain practical experience in cybersecurity operations within a production environment.**
- 2. Understand how cybersecurity supports business operations and risk management.**
- 3. Learn to evaluate security controls against industry best practices.**

Objective One: Gain Practical Experience in Cybersecurity Operations Within a Production Environment

This objective was fulfilled from the very beginning of my internship. Throughout the summer, I was able to observe experienced cybersecurity professionals, participate in meaningful projects, and gradually become more involved in the day-to-day operations of a MSP. One aspect of the internship that surprised me was how much I enjoyed building relationships with customers. Although many people think of cybersecurity as sitting behind a computer all day, I quickly realized that much of the profession revolves around helping people solve problems. Whether I was participating in service calls or working alongside technicians, I learned that technical knowledge is only part of the job. Building trust with clients and helping them continue their work is just as important.

Perhaps the greatest benefit of this internship was the confidence it gave me. I cannot emphasize that enough. Before accepting the position, I worried that choosing a smaller MSP might limit the amount of experience I would gain. I wondered if I would miss opportunities that might be available at a larger company. Looking back now, I could not have been more wrong. In many ways, I believe the opposite was true. Because RiverTrail Technology is a smaller MSP, I was able to work closely with experienced professionals

every day. The one-on-one instruction, the willingness of everyone to answer my questions, and the variety of projects I was trusted to complete created an incredible learning environment. Rather than being assigned one small piece of a larger project, I was exposed to many different areas of cybersecurity and managed IT services. Every day presented a new challenge, and that variety made the internship exciting from beginning to end.

Objective Two: Understand How Cybersecurity Supports Business Operations and Risk Management

This objective became much more meaningful than I expected. Before beginning my internship, one concern I had about the cybersecurity profession involved the rapid growth of artificial intelligence. Like many students entering the workforce, I wondered whether AI would eventually replace many of the jobs currently performed by cybersecurity professionals. I had spoken with several people working in the industry, and while opinions varied, there was always some uncertainty about what the future might look like.

My internship at RiverTrail Technology completely changed my perspective. Working in a MSP environment showed me that cybersecurity is about much more than technology. Every work ticket submitted by a client represented a real person who was unable to perform their job because of a technical issue. Whether it involved security, networking, or endpoint management, every problem required someone who understood the client's infrastructure, could diagnose the issue, communicate effectively, and reassure the client that the problem would be resolved as quickly as possible.

Objective Three: Learn to Evaluate Security Controls Against Industry Best Practices

This objective became apparent on my very first day. During my orientation, I was presented with a detailed internship guide containing security assessments and projects that RiverTrail wanted me to complete throughout the summer. One of my first reactions was realizing just how familiar many of these assignments felt. Almost immediately, I found myself visiting the NIST website and applying the same research techniques I had developed throughout my coursework at ODU.

It was a full-circle moment

Throughout my education, professors consistently emphasized the importance of using reputable sources, industry frameworks, and established cybersecurity standards when evaluating security controls. During my internship, I finally had the opportunity to apply those lessons to a real organization.

As I completed assessments involving Identity and Access Management, I found myself comparing RiverTrail's existing security posture against current best practices rather

than simply identifying problems. Instead of asking, "Does this work?" I began asking, "Is this the best way to do it?" and "How could this be improved?" That subtle change in perspective represents one of the greatest lessons I learned during my internship.

7. The Most Motivating and Exciting Aspects of My Internship

While every project I completed during my internship contributed to my growth as a cybersecurity professional, one experience stands above all the others as the most motivating and exciting. Throughout this paper, I have discussed the technical knowledge I gained, the security assessments I completed, and the confidence I developed while working at RiverTrail Technology. However, there was one opportunity that completely exceeded anything I could have imagined when I first began my internship.

In my third reflection paper, I briefly mentioned that I had been invited to participate in a project that RiverTrail Technology was developing and that I would discuss it in greater detail in my final paper. Although I must be careful not to reveal confidential details about the project, I can honestly say that it has become something I am incredibly passionate about. The owner of RiverTrail Technology has begun developing a cybersecurity product that, in my opinion, has the potential to improve the lives of millions of senior citizens. From the moment he explained his vision, I immediately understood both the need for the project and the positive impact it could have.

What makes this opportunity so meaningful is that I was not simply asked to observe or offer occasional suggestions. I was invited to become part of the project itself. Of all the compliments I received during my internship, none meant more than being trusted to contribute to something with such tremendous potential. Knowing that RiverTrail wanted me to remain involved even after my internship officially ended gave me a tremendous sense of pride and reinforced that my contributions were valued beyond fulfilling a university requirement.

One major contribution was developing a working hardware prototype for the project. This allowed me to combine several different skills that I have developed over the years. I was able to use my soldering experience while also applying programming knowledge that I gained through my coursework at ODU. Even more importantly, one of the ethics projects I completed at ODU focused on challenges affecting senior citizens and technology. Because of that project, I immediately understood the problem RiverTrail was trying to solve and the vision behind the product. It was one of those rare moments where everything I had learned throughout my education seemed to come together at exactly the right time.

Looking back, it truly felt like a full-circle moment. The knowledge I gained at ODU was no longer being used to complete assignments for a grade; it helped contribute to a project that has the potential to make a meaningful difference in people's lives. That realization is difficult to put into words. It reminded me why I chose cybersecurity in the first place. Technology is not simply about computers, it is about improving people's lives and protecting those who may be vulnerable.

Being invited to participate in this project has become one of the proudest accomplishments of my academic and professional journey. Before enrolling at ODU, I never could have imagined that I would one day be helping develop a cybersecurity product alongside experienced professionals. The confidence that RiverTrail placed in me, along with the opportunity to contribute to something so meaningful, has been incredibly motivating. It reinforced that choosing to return to school, pursue a degree in cybersecurity, and challenge myself academically was one of the best decisions I have ever made.

8. The Most Discouraging Aspects of My Internship

When I first began thinking about this section of my final paper, I expected that I would eventually identify at least one discouraging aspect of my internship. Every job has challenges, every organization has obstacles, and no experience is ever perfect. However, as I reflected on my time at RiverTrail Technology, I honestly struggled to identify a negative experience that significantly impacted my internship.

That is not to say the internship was without challenges. Like any professional environment, there were difficult problems to solve and unfamiliar technologies to learn. Those challenges, however, were exactly what I hoped to experience. They pushed me outside of my comfort zone and helped me grow both personally and professionally. I never viewed those moments as discouraging because each one became another opportunity to learn.

What surprised me the most was how quickly I felt like part of the team. From my first day, everyone at RiverTrail Technology made me feel welcome. My questions were encouraged, my ideas were taken seriously, and I was trusted with meaningful projects that contributed to the company's cybersecurity initiatives. Rather than feeling like "the intern," I felt like a valued member of the organization who happened to be learning along the way. That atmosphere made it easy to stay motivated, even when projects became challenging.

9. The Most Challenging Aspects of My Internship

If there is one word that best describes the most challenging aspect of my internship, it would be problem-solving. Every day at RiverTrail Technology presented a new challenge. Sometimes those challenges involved researching unfamiliar technologies, while other days required troubleshooting customer issues or developing recommendations to improve the company's cybersecurity posture. Unlike classroom assignments, there was rarely a single correct answer. Each situation required investigation, research, and creativity before a solution could be developed.

Ironically, those challenges became my favorite part of the internship. I have always enjoyed solving problems, and this internship confirmed that one of the reasons I chose cybersecurity was because it constantly presents new ones. Every project felt like a puzzle waiting to be solved. I found myself genuinely looking forward to the next challenge.

10. Recommendations for Future Interns

If I could offer advice to future interns who are preparing to begin their internship experience, my first recommendation would be to start looking early. Depending on where you live, internship opportunities can be limited, and waiting until the last minute may force you to accept a position that is not the best fit for your career goals. Starting early gave me the time to carefully evaluate opportunities rather than settling for the first position that became available.

My second recommendation would be to spend time finding an employer that is genuinely interested in helping you grow as a professional. Every internship will involve work, but there is a significant difference between an employer who views an intern as temporary help and one who views an intern as an investment in the future of the profession. Looking back at my experience with RiverTrail Technology, I am convinced that the mentorship I received was one of the biggest reasons my internship was so successful.

Do not accept an internship where your only responsibility is completing repetitive tasks or sitting quietly until your required hours are finished. Find an employer that challenges you, encourages you to ask questions, and trusts you with meaningful projects. The goal of an internship is not simply to complete a requirement for graduation, it is to gain experience that prepares you for the rest of your career.

One more piece of advice I would give is to recognize that you have something valuable to contribute, even as a student. It is easy to assume that everyone around you knows more than you do, and in many cases they probably have more experience. However, that does not mean your ideas lack value. You are entering the internship with fresh knowledge, current cybersecurity education, and most importantly a different

perspective that can benefit the organization. Do not be afraid to ask questions and share an idea that you think could improve a process or solve a problem.

11. Conclusion

As I reflect on my internship at RiverTrail Technology, one thought stands above all the others: this experience changed the way I see my future. When I first began my cybersecurity journey at ODU, one of my biggest concerns was whether I would be able to find meaningful employment while living in a small rural community. That concern stayed with me throughout much of my education. I assumed that most cybersecurity careers existed in large cities or required remote employment, and I often wondered if I would eventually have to choose between pursuing the career I wanted and remaining close to my family.

Today, I no longer have that concern.

One of the biggest lessons I learned during my internship is that cybersecurity is needed everywhere. Small businesses, local governments, schools, healthcare providers, and organizations in rural communities face many of the same cybersecurity challenges as large corporations. They need professionals who understand technology, who can solve complex problems, and who genuinely care about protecting their organizations and the people they serve.

Working at RiverTrail Technology completely changed my perspective on what a successful cybersecurity career can look like. I entered the internship wondering whether a small-town MSP would provide enough experience to prepare me for my future. Looking back now, I realize that it provided exactly what I needed. The one-on-one mentorship, the opportunity to work directly with experienced professionals, the wide variety of projects, and the close relationships that developed throughout the summer gave me an experience that exceeded every expectation I had when I accepted the position. Because of this the internship gave me confidence. Before beginning the internship, I believed I had learned a great deal through my coursework at ODU, but I still questioned whether I was truly ready to contribute in a professional environment. RiverTrail answered that question for me. I was trusted with meaningful projects, encouraged to think independently, and given opportunities to contribute ideas that had real value to the organization. By the end of my internship, I no longer saw myself simply as a student preparing for a career, I saw myself as someone capable of making meaningful contributions to the cybersecurity profession.

This internship has also influenced how I plan to spend the remainder of my time at ODU. Knowing that I have been invited to continue contributing to RiverTrail's cybersecurity product has given my education an entirely new sense of purpose. Rather than focusing

solely on completing assignments and earning grades, I now find myself looking at every course through the lens of how it can help me contribute to that project and become a better cybersecurity professional.

More than anything, interning has given me a new passion for learning. Cybersecurity is a field that changes every day, and instead of finding that intimidating, I now find it exciting. I have developed a genuine desire to continue expanding my knowledge, not only to advance my own career but also to help protect organizations and the people who depend on them. That passion is something I did not fully appreciate before this internship, and I know it will continue to motivate me long after I graduate from ODU.

Looking toward the future, one piece of advice I will continue to follow is never overlook the little guy. When searching for internships or future employment opportunities, it is easy to focus on large corporations with recognizable names. My experience taught me that some of the greatest opportunities can be found in smaller organizations where employees know one another personally.

If there is one final lesson I will carry with me from this experience, it is that relationships matter. Technical knowledge and certifications are essential in cybersecurity, but so are trust and genuine concern for the people around you. One of the things I appreciated most about RiverTrail was the personal connection I developed with the people I worked alongside. They took an interest in me not only as an intern but also as a person. They knew about my family, encouraged my growth and celebrated my successes. That type of work environment is something I now know I value, and it will influence the way I evaluate future career opportunities.

For those reasons, I will always consider my internship at RiverTrail Technology to be one of the most meaningful experiences of my education. It not only prepared me for a career in cybersecurity, it gave me confidence that the future I have been working toward is finally within reach.