

Stafford Fire and Rescue Internship

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Introduction

I completed my internship time at Stafford County Fire and Rescue in Stafford County Virginia. This internship and position were not only an introduction to the Information Technology field, but also a way to support First Responders. Not only did this internship grant me the ability to learn how to support individuals IT needs, but it also afforded me the opportunity to learn about communication systems, management tools, and be a changing force in the direction and motivations of the Fire and Rescue department.

Stafford County Fire and Rescue is relatively young as a department. While much of Stafford County's history involves a rich volunteer network founded in 1941, the career division was founded in 2005. The career division works in conjunction with the volunteers and together serves the people of Stafford and surrounding counties. The men and women of the Fire and Rescue Department run over 17,000 calls a year and are available every moment of every day. This department has 12 Companies, a training division, over 100 apparatus and vehicles, and hundreds of uniformed responders, volunteer and career alike. This internship and career offered me the opportunity to make a difference in the lives of anyone who lives, works, or travels through Stafford, Virginia.

I started this internship with the intent to learn about diagnosis and troubleshooting of computer systems and networks. As an IT Support Technician, it is imperative I understand the issues users may encounter on computers and systems and some of the nuisances of networking as it pertains to any ecosystem. I wanted to take this opportunity to learn not only how to fix individual computers and components, but fix the issues faced in this diverse ecosystem.

I also wanted to learn about the infrastructure of the IT Department and some ways I could further its effectiveness. Infrastructure includes networking equipment, communication equipment, and other means of moving information. In the Fire and Rescue Department, this infrastructure is vital to effective and accurate response.

Finally, I wanted to learn about management systems. I wanted to learn about remote management of end devices. Radios, iPads, computers, and phones are used regularly by office staff, firefighters, paramedics, and volunteers. This leads to hundreds of devices being utilized across the county, and even across the country. This widespread usage of devices means management can be a nightmare if every device needs to be touched to be fixed. Remote management through Mobile Device Management (MDM) or

cloud-based tools reduce the issues with this geographic challenge and I wanted to learn more about it.

When I first started at Stafford County, I was introduced to the County Fire Chief and the Assistant Chiefs. I was immediately shown to all the major locations and where much of our infrastructure was held. I was also introduced to the Information Technology Department for Stafford County; an entity I would interface with often to solve larger issues. Additionally, I was given a tour of all the major locations we support. This included fire stations, rescue stations, training locations, and administrative buildings for a total of seventeen locations.

After these initial introductions, I was trained in my day-to-day responsibilities. In the beginning, these responsibilities included simpler tasks such as reorganizing the supply room and helping with password resets and general IT issues. I was often accompanied by my supervisor in the beginning, just to ensure I felt confident in the tasks I was presented with. As time moved on, I was tasked with more responsibility, building my skill level a bit more as time passed.

Starting this internship, I felt a bit intimidated by my assumptions of the department. Taking on the responsibility of supporting the IT needs of hundreds of people, especially in such a geographically diverse style of department, seemed daunting at best. I also would be working with high-ranking officials in the county government such as the Fire Chief and the Assistant Chiefs. I was worried I may make mistakes out of ignorance or just simply from lack of experience. These feelings faded quickly as I began to get involved and showed the true nature of the Fire and Rescue Department.

In my position, I am the main IT Support Technician. I answer to a supervisor, who aids with higher tier issues and manages the IT infrastructure in the department. The two of us are civilian employees who in turn serve in the Support Services department, headed by the Assistant Chief of Support Services. The County Fire Chief is the top of management for all departments within Fire and Rescue.

Management and Effectiveness

My supervisor has an effective management method for me. In the beginning, he handled much of the daily tasks and would slowly incorporate me into helping him. This included things like resetting passwords, helping with iPad issues, or access to shared drives within the network. The general approach to management included showing me how

a task was done, providing me with resources such as manuals if I needed to replicate it, and then allowing me to complete the task myself. After supervising me do a task once or twice, he will typically allow me to work through similar tasks on my own, encouraging me to find solutions as I go but always being available for questions.

This style of showing me how to complete a task and then allowing me to work on them myself was highly effective for me. Having a baseline prevented me from feeling lost when attempting to do something for the first time. For example, it would have been impossible for me to reset even one password without first being shown how to navigate the structure of Active Directory. This granted me the basic tools needed to solve unique problems I would later encounter. By allowing me to work through problems on my own, I developed skills in basic processes on my own. While at times it may have been faster to get the answer from my supervisor, learning to navigate through issues taught me valuable lessons in how to triage and fix issues in vital systems throughout the county. This was only bolstered by the support I had from my supervisor. If I struggled with an issue or came to him with a question, he was always willing to help. Having this support bolstered my confidence and ensured the task would not lead to failure. This has drastically increased my skills since I first started. In fact, this experience may be the single most effective learning experience in Information Technology for me.

Duties, Assignments, and Projects

As the IT Support Technician, I have a broad role in the Fire and Rescue Department. It is my responsibility to issue, maintain, and replace the hardware used by the department. I am also responsible for maintaining access to critical resources and systems including but not limited to; the county domain, email and accounts, specialized Fire Rescue software, cloud and internet resources, and station alerting systems. Communication systems and hardware to include radio systems and cellular devices also fall into my job role.

My primary responsibilities lie in fixing the issues that plague our First Responders. This includes hardware issues such as failing computers or an unresponsive printer, or software issues like expired passwords or when a critical application stops working. I do my best each day to ensure any tickets that have been sent to me are cleared, prioritizing ones that have a direct impact on response. Once these tasks have been completed, I can move on to larger projects.

One of the first projects I suggested and set up was a MDM. The department currently uses close to a hundred iPads across the county, and each of those require

updates in person. This led to many devices being out of date on software, misuse, and a lack of continuity or standardization. The use of a device manager would allow me to service each of the iPads remotely and remove the need to visit all locations. In addition, each device would be standardized so no matter where you worked on any day, every device would work the exact same.

To start this project, I met with the responsible commands to learn how the iPads were used and to get a baseline on what the expectations were for each device. After careful notes and researching several platforms, I began to build out the profiles for each of these use cases. We set appropriate permissions, downloaded the appropriate applications, and set them in a specific location. After finalizing the details, test devices were deployed. After clearing these tests, I worked with commands and systematically enrolled every device used on apparatus into the MDM and applied the appropriate profiles to each. In the future we hope to expand the use case of the manager to include phones, computers, and other devices used by the department.

The next major project was to address asset management and ticket tracking. In a diverse environment, it can be exceedingly difficult to keep track of items. A laptop loaned out for a few days can seemingly walk off as other duties cloud the priorities of the mind. A borrowed iPad can become lost in much the same way. This was an issue across the entire department and not just within IT. So, the department acquired software to be able to track and assign items. This would help departments to track their items, the work done to and for the items, and allow the departments to publish reports regarding the items. As part of the IT department, I took on the responsibility of importing the bulk of our items into the system. In total I verified and imported approximately 761 items including our entire inventory of handheld radios. This, coupled with future updates as items get replaced, will continually aid our department in ensuring items are not lost, damaged, or otherwise disposed of. In addition, this system will help to develop a system for holding individuals accountable for the items in their care.

The software also offers a ticketing desk. After spending some time with the software, I developed two standard forms for submitting tickets to the helpdesk. These forms allow the end users to report any issues they may have and to track the repairs and progress of the ticket. These forms are simple currently but are subject to additions and improvements over time. Because this software is used by most of the departments in Fire and Rescue, many individuals already have access to the ticketing through their phone or a computer at their station. This makes the ticketing even more convenient. This feature has just been rolled out to the department starting in April and I cannot wait to see how it helps the flow of work.

As I continue to work for the department, I have begun learning about the radio system. Not only does this include the use and tracking of the radios, but also programming. I am currently working with resident experts on developing my own programs for radios with the intention of being able to aid or even take over the program if ever needed.

Cybersecurity on the Job

While my duties do not immediately fall into the roles of Cybersecurity, many aspects related to my duties do. Stafford county has a Cybersecurity division and as part of my role I ensure the rules, systems, and software they put in place are adhered to and maintained. In addition, I have begun making several changes to the systems we use as a department to ensure we further our security profile.

As part of our network, we have implemented an authenticator to enforce multi-factor authentication. While an intelligent step, it did not come without its struggles. Many people were faced with issues, keeping them locked out of their accounts. These struggles left many feeling like the authenticator was a waste of time. I aided many people in installing and connecting their authenticator and getting them back into their accounts. I always try to explain the benefits to them in the hope it helps their view on these tools.

We also install endpoint monitoring software on all our computers. This aids in the prevention of automated attacks from malware, malicious drives, and threat actors. This software is designed to monitor the actions of the computer and determine whether it seems dangerous or not. If the software sees a program or other application acting suspiciously, it quarantines and eventually deletes the program. This even worked against an automation I set up once, as the software believed the automation was acting suspiciously. The automation opened specific software and automatically logged in.

Finally, I have started to fix folder and file permissions in our department share drive. The department has a share drive that many of the employees have access to. But, due to mismanagement by previous employees and a lack of control over the drive, many people had access to much, if not all the information on the drive. This included budget items, investigation reports, and even some personal information stored there by some employees. I have begun to go through with each department and fix these permissions to prevent the access or tampering of folders by those who do not have the authority to do so.

ODU Preparation

My time studying at ODU was an excellent introduction to the real-world application. From the first day I was using knowledge from classes to troubleshoot and diagnose computers, software, and even radio applications. My classes have taught me how to communicate complicated concepts to people and even allow me to walk people through the steps to fix their own equipment over the phone. I have taken fundamental properties like the approach of least privilege and applied it directly to things like our shared drive. I have also learned skills like how to craft an email and how to communicate efficiently and effectively.

There have been some skills one doesn't typically learn in school. For example, the radio system. While not every business in the world uses radios, they are one of the foremost used forms of communication in the world. These systems include some of the common things with our lessons. Radio encryption is surprisingly similar to normal encryption of files, texts, or other transmissions. They even use the exact same encryption standards such as the Advanced Encryption Standard (AES), Data Encryption Standard (DES), and others. But while the encryption is the same, that is where the understanding of the system stops.

In addition, school enforces best practices with the intention of doing things correctly from the start. For example, legacy systems are dangerous and should be eliminated. And this is good practice. I believed the reason most companies didn't fix legacy systems was due to laziness or some other mundane reasoning. Starting to work in a company that operates every day, 24 hours a day, you realize some systems are incredibly difficult to replace. A current system replacement used by dispatch to alert the appropriate units to calls began replacement in January. The estimated completion date for this system replacement is in 2027. This isn't due to laziness but rather the complexity of the system being replaced. Learning how to apply what I have learned in school while cooperating with the needs of others has been an excellent addition to my arsenal and something that is nearly impossible to learn in a school setting.

Objective Fulfillment

My first objective was to understand the systems our users interface with to improve my troubleshooting and diagnosis of the issues at hand. In my time at the company, I have excelled at that specific task. When I started, my focus was around helping people with simple tasks such as ensuring they were using the correct login or making sure they were connected to the right network. I would shadow my supervisor as he solved higher level

tasks or dealt with software or systems I was unfamiliar with. As I saw him work through these issues, I asked questions about what he was doing and how the systems and software worked.

As time progressed, I was able to build a foundational understanding of nearly every system we use at the Fire department. Slowly, my supervisor began to hand over more of the tasks that came into the office, trusting my growing knowledge. This internship created vital skills in a variety of triage, diagnosis, and finding resolutions.

I was also interested in the infrastructure of the IT department, specifically within the Fire department. When dealing with so many locations, it seems almost impossible to pass this data around precisely. I learned a basic understanding of networking. Our networking is heavily facilitated by the Stafford County IT department. They maintain and manage the firewalls, switches, rules, and internet access. My role lies in ensuring we use these tools correctly. There are specific networks needed to access the proper tools. We also actively use VPN from outside the network to access information on the network.

This introduction to a diverse ecosystem has helped to show the importance of how networks work. I do not have direct say in the segregations of the network, the rules, or even what networks are available. But in my time, I have learned why the network is set up the way it is. The County IT department is responsible for making sure everyone who works for Stafford County is safely connected and this understanding has helped to form solutions for others.

I have gotten to use many remote management tools since starting with Stafford County. While I introduced the MDM, the department had other tools when I arrived. I have learned how to remote into computers to aid coworkers with online software. This software allows me to see and interact with their computer so I can fix issues. This allows me to expedite solutions and prevents confusion that may come with trying to talk someone through the steps over the phone. We also have a fleet of mobile cellular routers for our fire trucks and ambulances. These routers come with software that allows me to make modifications and updates from anywhere. I have used this to update Wi-Fi networks on all the routers from my desk.

Motivations

This internship creates so many opportunities for learning and growth. One of the main motivations I have had is the encouragement to become a part of the mission of the Fire department. From day one, my suggestions, skills, and capabilities have been viewed as an asset and valued contribution. This allows me to work, and sometimes even play,

while moving the department forward. Even missteps are viewed as learning moments and not mistakes. This support makes going to work a joy every day.

Another huge motivation for me is the opportunity to learn something new all of the time. I have learned things that are not normally available to people even in other IT departments. I get the opportunity to work with computer and radio hardware. I also get to act as a system administrator, securing accounts and access to systems within the department. I am a radio programmer. I don't have to specialize in any one aspect because they are all needed. And this keeps things interesting for me.

Finally, my career makes a difference. Firefighters, paramedics, and all other forms of volunteers benefit from the help I can offer. The systems I have already put in place can help form a brighter future for a department as young as the Fire and Rescue department.

Discouragements

As great as it is to work in such a place, there are times when it seems impossible to accomplish tasks. Inter-departmental cooperation and communication have been a struggle for us, especially when it comes to interfacing with changes made by other departments. Changes to the firewalls or networks within our stations have rendered some of our software useless. This leads to downtime and expedited fixes which can be stressful. Most of these effects could be mitigated by prior conversations and change management.

Another discouragement is the lack of solid goals from leadership. While all members of the department attempt to work together, there are times when multiple idea paths cause extra work. There are multiple projects started outside of the IT department which require input from us. When leadership lacks communication, these projects can become a burden requiring attention. It would be nicer to have a schedule I had more control over in this scenario.

Challenges

An interesting challenge I encountered during this time was the appropriate management of my time, resources, and energy. As I started the process, I was super energetic for this new opportunity. I spent nearly every moment of my employment pushing to learn more, accomplish more, and make my mark in this position. If I didn't have anything to do, I would clean or create a new idea or project. I would often cut my lunch breaks short to return to work, eager to impress and feeling the need to do more every day. A few months of this rigorous pace and suddenly I came in one day and did not want to do

anything. My supervisor warned me about burnout. At the time I had brushed off his concern as I was enjoying learning and the frenetic pace I had set. I didn't realize that even too much of a good thing was hurting me.

This led me to be more mindful of my mentality toward this position. While it is a blessing to be able to have my hands in almost all sections of IT, it also means the list of tasks is never quite complete. There is always another project, ticket, or meeting. And ensuring I did not lose the passion for computers and IT, I needed to slow down. Projects are now scheduled out over longer periods of time. The tickets are taken care of as soon as reasonably possible. And when I am off the clock, the work phone is not glued to my hip.

Another challenging aspect of this internship is learning dynamics and using cases for a Fire department. As mentioned before, we have many different careers in the department. Firefighters, paramedics, chiefs, volunteers, finance and procurement, administrative services, logisticians, and even emergency management positions. Each of these may use the same or different equipment daily and their use case for the equipment is often completely different. Learning the use case for each person and how the same equipment is used across the county is a large learning curve. As shown in the MDM project, it has helped immensely with command officers and others knowledgeable in the field to build a profile of the needs of each position.

Also explaining the proper use of a VPN can be difficult as well as this is not always common knowledge for others. We run into interesting problems when people forget to turn the VPN off in the office. This can lead to issues connecting to resources on the network but will show a valid connection to Wi-Fi or to an ethernet connection. I have done my best to succinctly state when the VPN is necessary and when it is not, but I am always willing to take a look if they are having issues connecting

Future Interns

Future interns can benefit from a basic understanding of the Fire service and its integration in the local government. Hit television shows glamorize and dramatize this line of work, but the real picture lies somewhere closer to reality. Learning the processes, needs, and hierarchy of the Fire service would have been a great help.

Technically speaking, interns should be prepared to make executive decisions about the hardware and software needs of the department. A deep understanding of hardware requirements for the use case of devices is imperative to ensure there is enough budget for the year. While the simple answer may be to order the best of the best, this solution often reduces the number of items available to you. In a large department, emergency repairs

can be needed at a moment's notice. Having a stock of items including full replacements is necessary. Ordering the right tool for the job is far better than just ordering the top-of-the-line option.

Be prepared to use nearly every bit of knowledge you have acquired over the years. I have used nearly everything I know about computers in my time here. Hardware replacements, software troubleshooting, data recovery, networking, command line, device management, cybersecurity techniques, system administration, server maintenance, and even adding radio to my list, I expand daily in my knowledge and capabilities. There is a balance, and no one will know it all coming in the door. But if you are prepared every day to learn something new or to solve a new problem, your day begins a little bit brighter in the morning.

Conclusion

This internship has been pivotal in my growth and in the foundations of my career. I have had the opportunity to learn in an environment that values my growth. I have learned the foundations of IT and even began to branch out into some specializations.

When I started this role, I understood a lot of the theory and educational knowledge behind the role. I had some experience solving problems with my own computers and even helping family and friends with their devices. I have completed my A+ certification and am close to completing my bachelor's degree. I had all the knowledge but needed the experience. And this is what the internship offered.

This knowledge is valuable to a company full of people who specialize in other things. Some do finance, some logistics, and others run into burning buildings. I offer an insight into the world of Information Technology, and this role has given me the confidence to share it. I am not seen as the source of problems, nor am I responsible for making problems just go away with a wave of my hands. I appreciate my knowledge and that support alone has grown my confidence.

This internship has renewed my passion to finish my degree at ODU. I am looking forward to amassing the last bit of information from school in the hope that it too will form my future and in turn, the future of my career. I have been able to make a lasting impact on the world, and anything else I can learn can only make my impact even better. I am proud of how far I have come, and this internship has not only given me valuable experience, but it

has also shown me that I am on the right path. When I finally walk across the stage, I know the journey will not be complete but just started.

In the future, I plan to continue at the IT helpdesk, and preferably in the Fire Department. I have recently discovered the joys of programming the radios our first responders use. While confusing at first, the challenge has drawn me in, and I hope to add this as a specialization one day. From the IT helpdesk, I hope to one day move on to be either a system analyst or maybe even a radio system administrator. No matter where I land after this, I know I have something special to offer the world. In the future I hope the systems and methods I put in place are used and grown. This internship has been life changing, and I am appreciative of my time there.