Old Dominion University
Information Technology Services

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Table of Contents

Contents

Introduction

As ransomware attacks, data breaches, denial of service attacks and other cybersecurity incidents continue to increase in number and complexity. Industry leaders, Cybersecurity professionals and Legislators are continuously looking for ways to mitigate the extraordinary economic and national security consequences of these threats. Underscoring the necessity of acquiring a diverse range of skills. This means acquiring knowledge in networking and network architecture, operating systems, virtual machines, cloud security, blockchain security, IoT, and ethical hacking topics. Not only to develop the computer forensics skills required to investigate security breaches and recover data, but to be able to develop and implement security, access, administrative controls, and policies that are the core of network defense. All while staying abreast of innovative technologies, techniques, security standards and practices designed to defeat evolving threats.

My time at Tidewater and Old Dominion has reinforced the technical skills I acquired through the military but has highlighted a need to expand my horizons outside of my military and college experience if I expect to have successful career in Cybersecurity. My internship at ODU ITS has provided valuable insight into the similarities and differences in the challenges faced by both DOD and Commercial Entities approach to network administration and compliance. But beyond insights into those differing approaches, my internship has provided several other opportunities as well. First an internship at the helpdesk has served to enhance my real world-experience, given me an opportunity to network with local professionals that could lead to future job opportunities, tested my current level of industry knowledge since I've retired and allowed me to practice those leadership and interpersonal skills that may have atrophied over the course of my college career. Aside from those additional opportunities I had four hard objectives I focused on achieving during my time at the helpdesk.

1. Gain experience in ODU's approach to ITSM.

2. Practice core IT competencies learned in ODU's Cybersecurity Bachelor's program.

3. Improve critical thinking, teamwork, and interpersonal skills.

4. Observe and understand day to day functions of ODU's WAN servicing 23,000 students and faculty encompassing the Main Norfolk campus and three higher education centers spread across Hampton Roads.

With this in mind, the next section will outline the overall department's organizational structure and services provided, and my initial introduction to ITS.

ITS Organizational Structure and Services

ODU's Information Technology Services (ITS) are built around four areas of focused support: Instructional tools, Research computing services, Faculty and Staff computing, Student Computing and Computing Security. ITS employs one hundred and sixty IT professionals spread over sixteen departments. ITS governs everything from Campus and Student Residential Network Infrastructure and Security. Instructional and Collaboration Tools like Canvas LMS, WordPress and Zoom. Research computing resources supporting data analytics, Geospatial research, application development. Banner Centralized records, software licensing, faculty and student Classroom support and email systems. This is just a sample of the catalog of services, systems and support provided to over twenty-three thousand students and eight hundred sixty-seven faculty by the ITS department structure listed below.

Department Structure

a) Administration

b) Business office

c) Client Services

    i) Helpdesk

    ii) Desktop Support

    iii) Technical Support Personnel, RESNET

    iv) Technical Support, Academic I

    v) Technical Support Personnel, Academic II

    vi) Technical Support Administrative

    vii) Technical Support, Remote and Engineering

d) Project Management

e) IT Service management

f) IT Marketing and Communications

g) Geospatial and Visualization Systems

h) Research and Cloud Computing

i) Academic Technologies

    i) E-learning

    ii) Application development

j) Classroom & Learning Space Technologies

    i) Classroom support

    ii) University Events\

k) Web & Mobile Solutions

l) Networks and Data Center Management

      i)   IT operations

      ii)   Network Facilities, Engineering & Operations

      iii)   Network Services

      iv)   Network Engineering

m)   Unified Communications & Collaboration

n)   Systems Engineering

o)   Enterprise Systems

      i)   Finance, HR & Payroll Info systems

      ii)   Database Systems

      iii)   Student Information Systems

      iv)   Enterprise Business Intelligence Architecture

      v)   Identity & Access

p)   IT Security & Planning

      i)   Security Operations

In addition, there are four advisory groups that counsel and guide ODU's ITS on strategies and decisions on information technologies.

Information Technology Advisory Council (ITAC)

Provides leadership, advice and guidance on information technology policies, strategies, issues, and directions from a university perspective.

Administration Systems Oversight Group (ASOG)

Advises ITS on the application of information technologies relative to Banner ® Unified Digital Campus, the SunGard information technology system.

Data Management Executive Committee (DMEC)

Establishes overall policies for management and access to the institutional data of the University.

High-Performance Computing Advisory Committee (HPC-AC)

Provides counsel on the use of information technology for research purposes at ODU.

Geospatial Advisory Council (GAC)

Engages in strategic discussion regarding the direction and development of geospatial technologies at the University.

For my internship, I received placement through the Monarch Internship and Co-Op office with ITS Client Services department specifically the helpdesk located in 1100 Monarch Hall. The department along with others within ITS are leveraging the Student Technology Employment Program (STEP). Providing students, the opportunity to gain essential workplace

experience during their enrollment. These departmental positions give students the credentials and practical knowledge they need to find success in the modern job market. While simultaneously providing these departments with additional staffing resources, they otherwise cannot fund.

My initial orientation consisted of an overview of the helpdesk mission, introductions to personnel within the department and a general overview of my areas of responsibility as a student employee. Followed by an initial two weeks of ono-on-one training with a technician and a further two weeks of shadowing student employees and then helpdesk technicians to resolve ongoing incident tickets. I am currently sitting at the helpdesk along with other student employees, taking incident calls, routing issues to relevant departments and resolving issues using the helpdesk database for customer troubleshooting. My initial impression of the department is that it is staffed by competent technicians with a good grasp of troubleshooting methodology and innate drive to dig into issues created by third party applications and technology. All in support of ITS's mission to provide timely and relevant support for their ODU customers.

Management Environment

The helpdesk manager: Clifton Blaisdell, Technical lead: Stefan Hancock and Help Desk Technician: Eddie Figueroa work well together. As I said previously, they have a firm grasp of troubleshooting methodology and maintain consistent awareness of the current state of network operations while collaborating with other ITS departments to identify future issues and develop plans to mitigate them. Before they become major outages or incidents. Clifton normally runs a morning meeting with Stefan and Eddie much like the officer and enlisted call I am used to in the military. I have had the opportunity to sit in on one. The general flow consists of reviewing current workforce schedules for both students and ODU helpdesk employees adjusting for upcoming holidays and other events. Then focuses on existing issues currently being addressed the department and potential identified issues that will need collaboration with other departments to mitigate network availability issues created by software updates, data migrations or future integration of new systems into the enterprise. Then ends the meeting by discussing metrics and trends collected by ServiceNow that reflect the helpdesk's efficiency or hint at a major incident or outage on the horizon. I did note he tends to limit the meeting to no more than thirty minutes, if possible, but that sometimes they can run well over. Nothing different than what I have seen throughout twenty-one years of department quarters and Khaki-calls.

Otherwise, day-to-day operations on the Helpdesk floor are supervised by Stefan, with Eddie taking over when he either works remotely or is on leave. The students take incident calls along with the technicians and maintain an ongoing flow of collaboration in terms of asking questions, sharing information, and updating Stefan and Eddie with any customer issues they couldn't resolve and or customer dissatisfaction that may need mid-level management to resolve. Overall, I found that this team interfaces well with the student employees providing a positive

mentorship environment, that in more than one instance has led to the students actively seeking employment with ITS.

Major work duties, assignments, and projects

My major work duties at the helpdesk are focused on tier 1 IT support, the most basic form of technical support service for customers and clients who need help with IT products and services. Although I have more job experience than other student employees which translates into better insights into technical problems, I still have minimal administrative access based on the least privilege model and use their Microsoft OneNote database for basic troubleshooting to diagnose and resolve minor issues as well as provide form fields to fill out and route incident tickets Recording student and faculty user requests, attend phone calls, reply to emails, and logging system network issue for escalation. There are four main systems used to answer, log, route, and resolve trouble tickets and user interactions.

The 8x8 phone system (8x8) is a cloud-based communication platform that offers a range of services such as voice, video, chat, and APIs. It combines voice, video, and chat tools with a cloud-based PBX system to create a comprehensive space for managing customer communication and cross-company collaboration. The application is hosted and maintained on ODU's enterprise and is the primary means for managing customer phone calls. Hard lines are installed on the watch floor and have higher priority than VoIP calls as they are reserved for the hotlines serving immediate classroom support requests.
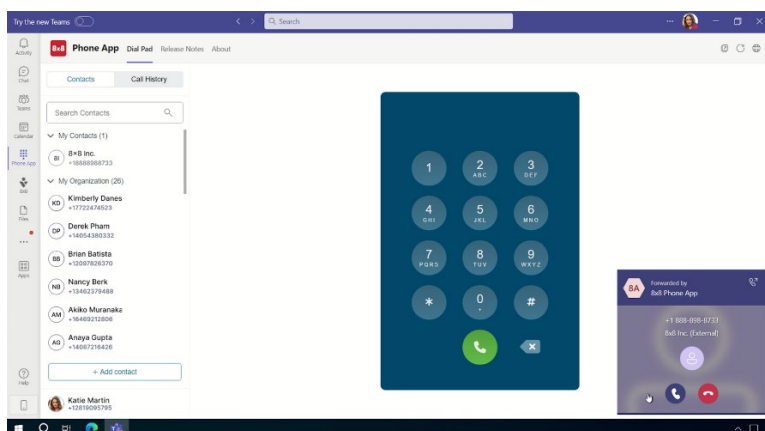
Another important tool utilized in resolving and troubleshooting is my accounts and groups role based access to the midas.odu.edu page. Normal user's permissions give them basic information such as their Midas id, student e-mail address with access to update passwords security questions and two factor authentication methods. My permissions allow me to view student and faculty accounts, verify identity, view services and roles and groups assigned, provide manual password resets, initiate SMS reactivation tokens. It provides a good initial look at the customer's account to identify role and access issues and search for the groups that have ownership of particular drive access or e-mail distribution groups. Case in point. I had a returning employee with account issues, and I was able to identify that a new account with the adjunct role had been created even though their student account was still active (generally student accounts remain and

adjunct or faculty roles are added on).I was able to guide them through the process of setting up their new account and routed a ticket to accounts and IDM to address the duplicate student account.
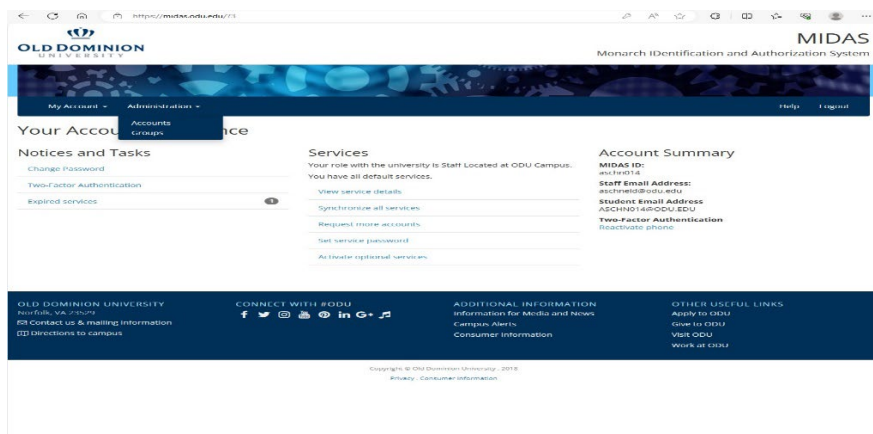
The ServiceNow (Nagendrag, 2023) incident ticketing system is our one stop shop for incident management. ServiceNow is a cloud-based software platform that provides IT services for automating business tasks and management. Including IT service, operations, customer service management, human resource management, security operations, risk and compliance, workplace service delivery, and field service management. Giving us the tools, we need to create and build out customer support tickets for routing to the relevant department as well as a customer support database to aid in troubleshooting. Specifically, it allows us to search for customer accounts via username or UIN, assign impact and priority levels and provide problem descriptions, attach screenshots, search for related OneNote troubleshooting procedures and forms via keywords. It also allows us to send updates and requests for information directly to the customer via the additional comments section of the incident ticket. Either to their recovery email or another specified in the watchlist under Notes. This enables customers to email the information directly to the ticketing system where is logged in and added to the ticket history which can be reviewed by the relevant technicians. Ensuring we assign tickets to appropriate departments for their review and resolution. The dashboard itself is well designed and is broken down into separate windows showing the number of new, and ongoing tickets in the helpdesk queue. When you look at a ticket it shows who else is currently viewing it assist with minimizing duplicate efforts. Another important aspect of ServiceNow is the metrics and trend data it collects to assist Clifton the helpdesk manager, giving him the data, he needs for his boss and the CIO to make important decisions regarding existing and future network operations.

The last collaborative tool we use is Microsoft teams, sharing links for troubleshooting, providing a separate line of communication to ask questions and share information without disturbing other helpdesk employees assisting customers.

Skills acquired prior and those gained during my internship.

Most of the skills I utilized during my internship were soft skills not directly related to cybersecurity but still an important piece of being successful: governing customer interactions, working effectively within a group dynamic and motivating individuals as a team member. Each gained and practiced during my time in the military and maybe a little rusty after a three-year hiatus. Troubleshooting methodology would be a hard skill I learned in the service and one that my internship gave me an opportunity to exercise. I do think the most valuable skill I gained was my training with and employment of ServiceNow. I was able to work on (in small part) on a Platform as a service system (PaaS), one of the ITSM based systems that commercial entities use almost exclusively. I was only exposed to the remedy network management system during my time in the military. Which, at least in my experience, was not as well integrated or robust as the system utilized at ODU. I do think my on-the-job experience has changed my understanding of

just how integral systems like ServiceNow are to effective and efficient operations and governance.

So how did the ODU curriculum prepare me (or not prepare me) for the internship? I would say that the breadth of my college career gave me a foundation to approach my internship with confidence. Foundations in coding languages; although I understood the basis for popular machine languages like Java and SQL, I had actually never programmed in any until I went back to school. I was able to reinforce skills I had not used in the latter half of my career: Network administrative tools, CISCO configuration and routing fundamentals and introduction to cloud computing infrastructure design and services that the military was just starting to truly embrace. Ethical hacking instruction giving me the opportunity to gain experience tools and techniques like traffic tracing and analysis, using port scanning tools and penetration testing were new in my military experience and training. Using Metasploit to enumerate target machine vulnerabilities and deploy Server Message Block exploits in a custom payload as well as practicing brute force and dictionary attack methods to crack passwords and tools to crack and decrypt Wi-Fi traffic were also proficiencies never acquired. Cyber law opened my eyes to HIPPA and FERPA regulations governing everything from medical and student data privacy. How the General Data Protection Regulation can affect US based companies conducting business in the EU as well as fourth amendment search and seizure of digital property and the legal precedents that frame just how much an effect that improper collection and chain of custody of such can have on individual due process and informational privacy. Unfortunately, with the limited scope of my helpdesk work duties, I was not able to practice some of the more specific Cybersecurity skills I have gained over that time. But with my previous experience with remedy, the learning curve with ServiceNow was not that steep.

Internship goals

1. Gain experience in ODU's approach to ITSM.

2. Practice core IT competencies learned in ODU's Cybersecurity Bachelor's program.

3. Improve critical thinking, teamwork, and interpersonal skills.

4. Observe and understand day to day functions of ODU's WAN servicing 23,000 students and faculty encompassing the Main Norfolk campus and three higher education centers spread across Hampton Roads.

So, out of the four stated objectives in my introduction. I am confident I was able to meet two of those objectives and partially meet another. The first was to gain experience in ODU's approach to ITSM. Through my internship I have gained valuable insight into why ODU adopted the Platform as a Service model over software as a service. That it offers a flexible, scalable cloud platform to develop, deploy, run, and manage apps like their ODU mobile app as well as utilize third party applications. Something missing from the software as a service model which relies on software licensed on a subscription basis. This is value added to researchers and faculty at ODU who can collaborate with ITS to develop specific applications in house vice paying a third-party contract to develop and maintain them. The second objective I was able to meet was to practice and improve my critical thinking, teamwork, and interpersonal skills. Working directly with Stefan, Eddie and the other student employees shook some of the rust off my teamwork skills, while interaction with customers polished those soft skills needed to provide a

solid customer experience and effectively communication with future employers. Unfortunately, due to my limited job scope and permission set, I was not able to practice core competencies in network administration, routing, security, and compliance. I did get to observe and gain insights into the day to functions of the helpdesk but not the overall operations of ODU's WAN.

Motivating, Discouraging and Challenging internship aspects

One of the motivating aspects of my internship was my daily interactions with helpdesk staff and customers. I had forgotten what it was to look forward to a day-to-day job. I have always been a people person and point of fact is the reason I chose to be a radio operator in the navy vice another rate. Perhaps in part it is the reason I was able to communicate effectively with subordinates and peers over the course of my military career. Another motivational aspect was getting the experience of working outside a military structure in a more relaxed but still focused atmosphere. Overall, a well-balanced working environment without the more egregious "sky is falling" and make more with less attitudes prevalent in my experience. As it relates to discouraging and challenging aspects, I did not ever feel either during my time at the helpdesk. As I said, the helpdesk leadership maintains a positive mentorship environment and provides the tools necessary for students to do their job. There was never an instance where Stefan or Eddie told someone to just figure it out or ignored student employee questions and issues.

My recommendations for future interns at the ITS helpdesk

My first and most important recommendation not only for future interns at the helpdesk, but any doing an internship at ODU. Start early! Desirable positions fill quickly, and you need to apply just as urgently unless you want to be the one left standing when the music stops. Utilizing campus resources like ODU's internship and co-op office is an effective way to find a position. Second, it is never too early to apply for an internship in the field you have chosen. The experience can provide you with the drive to continue working toward that particular degree or give you perspective that a particular job or your chosen field of study may not be for you. Giving you the flexibility to change your degree without wasting money and time on something that is not a good fit. Otherwise, a basic knowledge of networking and cybersecurity concepts will contribute to your confidence and overall success in these positions. My last recommendation is to leverage the network of contacts you make while working there. Job recommendations from professionals within the company whether applying for positions inside or outside the organization can give you an advantage over other applicants for entry level positions.

Conclusion

I enjoyed my time at the helpdesk and have gained practical experience and valuable insights into not only ITSM models of operations and governance but differences and similarities in the social and work dynamics of a nonmilitary IT department. I believe will serve me well in the future as I search for employment in cybersecurity oversight and governance. Understanding other roles, responsibilities and challenges outside your narrow job title enables you to identify and nurture talent, encourage critical thinking in others, motivates people as individuals and a team by learning what drives them. These perspectives are part of being good at your job, maintaining relevance and are bricks in the foundation of your future professional relationships and career.

References

Nagendrag. (2023, June 27). *What is ServiceNow? get started on ServiceNow Fundamentals today! - cloudfoundation: Blog*. CloudFoundation. https://cloudfoundation.com/blog/what-is-servicenow/

Contact Center and Cloud Communications for the CX-focused. 8x8. (n.d.). https://www.8x8.com/