Internship Rotation 2 - Reflection Report

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Learning Objectives

Objective 1: Enterprise Automation and Deployment Tools

My first learning goal for this rotation was to gain hands-on experience and a deeper understanding of Ansible for infrastructure automation and deployment, including the development and utilization of Ansible "playbooks." While access to production environments is restricted for interns, I achieved this objective through a combination of shadowing and external training tools.

I spent a lot of time shadowing team members during the creation of Ansible playbooks. This involved observing how playbooks were developed from scratch, executed across various server environments, and debugged if issues arose. This learning was crucial in understanding the best practices for writing automation scripts, as well as the complex workflows involved in large-scale enterprise deployments. I gained insight into how Ansible is used to manage configurations, deploy software, and perform system updates on critical systems. Ansible and similar automation tools are used heavily across enterprise infrastructure, and is an extremely useful skills to know in the field.

Objective 2: Gain Experience with Enterprise Hypervisors

My second objective was to acquire hands-on experience with enterprise-grade hypervisors, specifically Nutanix and VMware, for deploying and managing virtual machines. Due to the critical nature of production virtualization environments, my direct access was primarily read-only and limited to inventory verification. This allowed me to confirm virtual machine information against the Configuration Management Database (CMDB), ensuring data accuracy and consistency.

Despite the read-only access, I gained invaluable insight by extensively shadowing team members as they performed operations. I observed the processes involved in deploying new virtual machines, from initial resource allocation and network configuration to operating system installation. I also learned about how existing virtual machines are edited, including resource adjustments, snapshot management, and patching procedures. Furthermore, I gained a comprehensive understanding of the secure and efficient processes for decommissioning virtual machines, ensuring that resources are properly reclaimed and data is securely retired. This shadowing allowed me to understand the differences and advantages of each hypervisor in an enterprise context. This experience has significantly broadened my virtualization knowledge beyond the open-source and personal hypervisors I was familiar with, providing insights into enterprise-level virtualization strategies and their operational complexities.

Objective 3: Enterprise Security and Asset Management Skills

My final learning goal was to gain a deeper understanding of enterprise security practices, particularly Technical Security Baselines (TSBs), and to acquire practical experience in physical and virtual asset management, including hardware retirement processes. This objective was met through a combination of shadowing and direct hands-on involvement in non-production tasks.

I learned about and applied TSBs by shadowing how audits are performed to ensure that physical and virtual servers adhere to strict security policies. This gave me a clear understanding of the compliance requirements and the importance of maintaining a secure infrastructure. Furthermore, I shadowed team members as they configured machines to fix audit issues, gaining practical insight into issue remediation and the real-world application of

TSBs. This experience highlighted the continuous effort required to maintain a secure and compliant environment.

For asset management, I gained direct hands-on experience taking inventory of both physical hardware assets and virtual machines. This involved verifying their details against the Configuration Management Database (CMDB), which is used for asset tracking and resource planning. I also participated in the decommissioning of hardware, understanding the secure and efficient processes for retiring physical server infrastructure from the data center. This exposure to security practices and asset lifecycle management has shown their importance in maintaining operational efficiency and ensuring regulatory compliance within an enterprise IT environment.

Application of Coursework

Many of my courses aided in my experience during this internship rotation. Even if they didn't strictly cover the specific tools used by the team, they helped provide me with a fundamental understanding of many of the concepts. The following courses were most applicable:

PC Set-up and Maintenance: In this course I learned about computer hardware, operating system installation, and troubleshooting techniques. This knowledge was directly applicable when working with physical server infrastructure, allowing me to understand the underlying architecture of the x86 systems and understand the implications of various configurations and hardware issues.

Enabling Business with Information Systems: The topics of management, system, and organizational theory covered in this course were instrumental in understanding the broader context of enterprise IT. It helped me see how the x86 team's specific work with physical servers, virtualization, and automation directly contributes to the overall business operations. I

gained a clearer perspective on the importance of efficient system management, resource allocation, and strategic planning within a large, complex organization.

Networking Fundamentals: This course provided essential knowledge of both physical and virtual networking concepts. This was crucial for understanding how servers communicate within the data center, how virtual networks are configured and managed within VMware and Nutanix hypervisors, and how network security principles apply to the x86 environment. My understanding of IP addressing, routing, firewalls, and network protocols allowed me to understand the networking aspects of infrastructure.

Information Security and Assurance & Network Security: These courses provided a strong background in general cybersecurity principles. This comprehensive knowledge was vital for understanding and applying Technical Security Baselines (TSBs), which are critical for maintaining a secure enterprise environment. My coursework enabled me to actively participate in understanding security audits and appreciate the necessity of ensuring the secure deployment and management of both physical and virtual assets.

Software Engineering I & II: These courses provided fundamental programming concepts, logical thinking, and problem-solving skills. These were directly applicable to understanding and interpreting scripts for automation, such as Ansible playbooks. The principles of modularity, efficiency, and scalability learned in software engineering translated well into comprehending how complex infrastructure automation is designed and implemented, contributing to my ability to develop scalable solutions for infrastructure management.

Career Goal

Short-Term Goals

One of my immediate short-term goals was to connect and network effectively with my team and other individuals who collaborate with the x86 team. I actively achieved this by engaging in daily stand-ups, team meetings, and informal discussions. I made an effort to work closely with both of my two team leads and my team manager, ensuring that I not only met my assigned learning objectives but also gained comprehensive experience across the many different tasks the team handled.

Beyond the technical learning, this focused interaction helped me build strong personal connections within the team and the broader department. I consistently demonstrated my genuine interest in the work, my want to learn, and my drive to contribute. This approach not only enhanced my experience but also allowed me to showcase my skills and dedication. I believe these connections and the demonstrated interest can significantly contribute to future job opportunities, whether within the x86 team itself or other related teams within the department.

Medium-Term Goals

In the medium term, my objective is to develop a more specific understanding of the skills I want to focus on within Computer Science. This internship rotation has provided real-world experience that is helping me narrow down my interests within this broad field. My work in virtualization, enterprise hardware, and automation has been really interesting to me.. These are skills that I would like to continue focusing on and developing further.

While this experience has highlighted a strong inclination towards infrastructure, I am still committed to keeping my options open and exploring other skill sets. For instance, my

next internship will focus on software development, which I may also want to develop skills in. However, the hands-on and observational experiences within the x86 team have definitely solidified my enjoyment and passion for developing these current infrastructure-focused skills.

Long Term Goals

In the long run, my main goal is to secure a full-time position at a company where I feel both valued and consistently challenged to grow and learn. Based on my hands-on experience and shadowing within the x86 team, I am particularly interested in pursuing a career in this area. The wide variety of both the hardware and the tools used in infrastructure interests me and, since the tools are constantly evolving, I will be able to continue to learn in this field.

The roles within infrastructure, as I've observed on the x86 team, cover a wide array of tasks, including working with physical hardware, managing virtualization platforms, developing automation solutions, and ensuring robust security. This diversity of responsibilities is the kind of role that I am looking for in a career. I am confident that a position within infrastructure operations would provide the challenge and learning opportunities that I am seeking. My hope is to find a long-term position where I can stay for 5+ years, gaining significant real-world experience and becoming a highly knowledgeable and proficient professional in this field.