THE UNIVERSITY OF ZAMBIA
SCHOOL OF NATURAL SCIENCES
COMPUTER SCIENCE DEPARTMENT

NAME OF THE ORGANIZATION: CENTRE FOR INFORMATION AND COMMUNICATION TECHNOLOGIES (CICT)

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I am deeply grateful to all those who have played a role in making my internship a fulfilling and enriching experience. Firstly, I extend my sincere appreciation to the esteemed faculty members at the University of Zambia for affording me the opportunity to apply theoretical knowledge in real-world scenarios within the field of information and communication technologies. Their continuous guidance and encouragement have been invaluable in shaping my professional journey.

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Executive Summary

This report provides a comprehensive overview of my internship experience at the Centre for Information and Communication Technologies (CICT) located at the University of Zambia. Throughout my internship, I was exposed to various departments and tasks, gaining practical experience in areas such as network and software support, cable management, and hardware troubleshooting.

The internship spanned from December 4th, 2023, to March 28th, 2024, during which I received training in the Network and Software Support department, focusing specifically on networking tasks. In addition to practical tasks, I also engaged in critical analysis and SWOT analysis to evaluate the organization's strengths, weaknesses, opportunities, and threats.

One of the key highlights of my internship was the hands-on experience I gained in managing cables, configuring switches, troubleshooting hardware issues, and deploying software tools such as Xymon and Smokeping for network monitoring. Additionally, I was involved in mounting Wi-Fi radios, replacing components in Cisco switches, and configuring network monitoring tools.

Through my coursework in computer systems, data communication and networks, and information and network security, I was able to apply theoretical concepts to practical scenarios encountered during my internship, enhancing my skills and understanding of IT operations.

The critical analysis provided insights into the organization's strengths in in-house system development, efficient cable management, and the utilization of network monitoring tools. However, weaknesses such as dependency on internal resources and limited accessibility of certain software tools were also identified.

Opportunities for improvement include exploring external partnerships for technology advancement and enhancing accessibility to network monitoring tools for authorized personnel. Threats such as technological obsolescence and cybersecurity risks underscore the need for continuous innovation and vigilance.

In conclusion, my internship at CICT provided valuable hands-on experience and learning opportunities, contributing to my professional growth and understanding of IT operations in an organizational setting. I recommend further exploration of external partnerships and continuous investment in technology to address identified weaknesses and capitalize on emerging opportunities.

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1) Overview Of The Organization

1.1) Brief History

The Centre for Information and Communication Technologies (CICT) at the University of Zambia has been at the forefront of advancing information and communication technologies (ICTs) to support education, research, and administrative functions. Established with the mission to strategically deploy ICTs for teaching, learning, and research, the center has played a pivotal role in providing essential ICT infrastructure and services to meet the university's strategic objectives. Over the years, CICT has evolved to become a vital hub for ICT development and innovation within the university community.

1.2) Introduction of the Organization

CICT serves as the central hub for all critical university systems and offers a wide range of services, including internet provision, email services, web hosting, and development of university-wide systems tailored to meet specific stakeholder requirements. Additionally, the center provides ICT training services to both staff and students, covering various applications such as SPSS, STATA, computer hardware maintenance, and more. With a focus on enhancing skills and knowledge, CICT aims to contribute to the growth and financial sustainability of the university and its stakeholders.

1.3) Policy of the Organization

The core policy focus of CICT revolves around harnessing ICT to enrich education delivery and align with the strategic objectives of the University of Zambia. This entails devising and executing innovative ICT solutions tailored to the university's distinct requirements. Moreover, CICT is dedicated to fostering a culture of ongoing enhancement and superior service provision in ICT, ensuring technology's effective utilization to propel the university's overarching goals.

As for the Quality Assurance and Security (QAS) department within CICT, its policy mandate revolves around fortifying the university's information systems. By implementing robust governance frameworks, resilient security architectures, and continuous awareness initiatives, QAS safeguards the confidentiality, integrity, and availability of vital information pertaining to students, faculty, and staff. Collaborating closely with other CICT divisions and the wider campus community, the department endeavors to mitigate risks and preserve university assets.

1.4) Competitors

While CICT operates within the university context, it faces competition in the broader landscape of ICT service providers and educational institutions. Competitors may include other universities offering similar ICT services, private ICT firms providing consultancy and system customization services, and government agencies involved in ICT infrastructure development. However, CICT maintains its competitive edge through its focus on innovation, quality service delivery, and collaboration with internal and external stakeholders to meet the evolving needs of the university community.

2) Organizational Structure

2.1) Organizational Hierarchy Chart

University of Zambia - Centre for Information and Communication Technologies (CICT) Organizational Hierarchy Chart on the ***'Next'*** page.

2.2) Number of Employees

The Centre for Information and Communication Technologies (CICT) currently employs 42 staff members across its various departments. However, due to the dynamic and demanding nature of its operations, the department often operates with an approximate number of 50 employees. This allows CICT to manage its workload more efficiently and ensures that there is sufficient manpower to address any fluctuations in demand and handle peak periods effectively. The ability to scale up the number of employees as needed demonstrates the department's adaptability and commitment to maintaining high service standards.

2.3) Main Offices

CICT's primary offices are situated at the University of Zambia campus in Lusaka, Zambia, strategically positioned near Central Admin for convenient access by staff and stakeholders. These offices serve as central hubs for administrative functions, facilitating coordination and teamwork among departmental staff. Additionally, satellite offices located in areas like Ridgeway, the Institute of Distance Learning (IDE), and INESOR are established to provide support services to different university departments and units. The accessibility of these offices promotes effective communication and enables swift resolution of technical issues campus-wide.

2.4) Introduction of All the Departments

1. ***Consultancy & Training Unit (CTU):*** CTU offers consultancy and training services in Information Technology, catering to both the working class and individuals not in formal employment. It provides professional and skill-based courses, educational and ICT services, and revenue generation through ICT consultancy.
2. ***Network & Software Support (NSS):*** NSS comprises three sections responsible for telecommunication, ICT support, and networking. It manages the university's IT infrastructure, including network engineering services, telecommunication support, and ICT support services.
3. ***Quality Assurance and Security (QAS):*** QAS is dedicated to building secure information systems at the university. It collaborates with other CICT departments to ensure the confidentiality, integrity, and availability of information. QAS provides services such as preventing data breaches, implementing access management systems, and conducting security audits.

4. ***Department of Systems Development (SD):*** SD designs, develops, implements, and evaluates computer-based information systems for the University of Zambia. It offers services such as maintaining the Student Information System, administering e-learning with Moodle, and supporting the Performance Management System.

2.5) Comments on the Organizational Structure

The organizational structure of CICT reflects a well-defined hierarchy with clear delineation of departments and their respective functions. Each department plays a vital role in supporting the university's ICT infrastructure and services, contributing to the overall mission of enhancing teaching, learning, and research through technology. The structure allows for efficient coordination and collaboration among departments, ensuring effective delivery of ICT solutions and services to meet the university's strategic objectives.

3) Plan Of My Internship Program

3.1) Introduction of the Branch/Area Office

During my internship, I had the opportunity to work at the Centre for Information and Communication Technologies (CICT) located within the University of Zambia campus in Lusaka, Zambia. CICT serves as a pivotal hub for the strategic deployment of ICTs to support education, research, and administrative functions within the university. The main office is strategically positioned near Central Admin, facilitating easy access for staff members and stakeholders. Additionally, CICT operates satellite offices and branches in locations such as Ridgeway, the Institute of Distance Learning (IDE), and INESOR, extending support services to various university departments and units.

3.2) Starting and Ending Dates of Internship

My enriching internship journey spanned from December 4th, 2023, to March 28th, 2024, encapsulating a period of intense learning and practical exposure within the vibrant ecosystem of the Centre for Information and Communication Technologies (CICT) at the University of Zambia.

3.3) Departments and Duration of Training

Throughout my internship, I received comprehensive training in the Network and Software Support (NSS) department, focusing specifically on networking. This training encompassed a duration of 16 weeks, providing me with in-depth insights and practical experience in various aspects of network engineering, telecommunications, and ICT support services.

During this period, I actively participated in the following areas within the NSS department:

1. **Network Engineering Services**
    - Managed and maintained the university's Internet and internal network infrastructure across multiple campuses and provincial centers.

- Assisted in the maintenance of fiber optic networks connecting various teaching buildings and campuses.
- Supported and managed network operations primarily based on Cisco switches.
- Installed and maintained wireless network Services in student hostels and offices, ensuring seamless connectivity.

2. **Telecommunication Services**

    - Contributed to the maintenance of the campus internal telecommunications system (PBX).

3. **ICT Support Services**

    - Offered general ICT support services to ensure the smooth operation of equipment and services.

The internship program provided me with a rich learning experience, combining theoretical knowledge with practical hands-on training in a dynamic and collaborative environment. Through active participation in diverse projects and tasks within the NSS department, I gained valuable insights into network engineering, telecommunications, and ICT support services, laying a solid foundation for my future career in the field of information technology.

4) Training Program

4.1) Detailed description of the operations/activities performed by the department(s)

During my internship at the University of Zambia's Centre for Information and Communication Technologies (CICT), I was involved in a wide range of operations and activities aimed at maintaining and improving the university's IT infrastructure. This encompassed various departments and offices across the campus, each with its unique set of technological needs and challenges.

One of the primary tasks involved troubleshooting network connectivity issues reported by different departments and offices. This often-required on-site visits to diagnose problems related to hardware malfunctions, cable faults, or configuration errors. By employing diagnostic tools and methodologies, I was able to identify the root causes of these issues and implement solutions to restore network connectivity promptly.

Additionally, I participated in setting up and configuring network devices, including routers, switches, and access points, to expand network coverage and enhance connectivity in remote areas of the campus. This involved collaborating with departmental staff to understand their specific requirements and ensure seamless integration of new network infrastructure.

Moreover, I was actively involved in ongoing projects aimed at upgrading and optimizing the university's network infrastructure. This included tasks such as installing new network switches, upgrading firmware, and implementing network segmentation strategies to enhance security and performance. By staying abreast of emerging technologies and best practices, I contributed to the development of robust and reliable network systems capable of meeting the growing demands of the university community.

4.2) Detailed description of the task(s) assigned OR detailed description of the project assigned

Throughout my internship, I was entrusted with various tasks and projects aimed at improving network efficiency, resolving connectivity issues, and enhancing overall IT infrastructure at the University of Zambia. One of the significant tasks assigned to me was troubleshooting internet connectivity problems reported by different departments and offices across the campus.

This involved conducting thorough diagnostics, identifying the root causes of the issues, and implementing appropriate solutions to restore network connectivity.

In addition to troubleshooting, I was also involved in setting up and configuring network devices, such as routers, switches, and access points, to expand network coverage and improve connectivity in remote areas of the campus. For example, I participated in installing radios at various locations within the School of Law to distribute the 5G network, ensuring reliable internet access for students and faculty members.

Furthermore, I actively participated in ongoing projects aimed at upgrading network infrastructure and implementing new technologies to meet the evolving needs of the university community. This included assisting in the installation of new network switches, upgrading firmware, and implementing network segmentation strategies to enhance security and performance.

Additionally, a project assigned to us by the network manager aimed to analyze and optimize the university's network infrastructure. Although we did not reach the conclusion of this project during my internship, we managed to complete the tasks assigned.

These tasks included:

1) Retrieving all configurations from the edge router, core switch, and server switch to assess their current settings and identify any potential misconfigurations.

2) Identifying any misconfigurations within the network devices to rectify them and ensure optimal performance and security.

3) Obtaining the routing table from the systems department, which included retrieving DNS and Observium information to analyze network traffic and monitor performance.

4) Drawing up the topology of the entire network to visualize its structure and identify any areas for improvement or optimization.

These tasks required meticulous attention to detail and a comprehensive understanding of network protocols and configurations. Despite the complexity of the project, we were able to make significant progress in gathering the necessary data and conducting preliminary analyses to lay the groundwork for future optimization efforts.

Overall, the tasks and projects assigned to me during my internship provided me with invaluable hands-on experience in network engineering and IT operations, allowing me to apply theoretical knowledge in real-world scenarios and develop practical skills that will be beneficial for my future career in the field of information technology.

5) Reflective Journal Entities

5.1) Month 1 - December 2023

Week 1

Orientation

During the orientation session, we learned about the basics of networking, including the different types of cables used in networking, cable termination techniques, and how to use a crimper. We also discussed communication protocols and the arrangement of cables when terminating them using the 568B configuration.

The orientation session provided a solid foundation for understanding the practical aspects of network engineering. Learning about cable termination techniques was particularly insightful, as it gave us hands-on experience in creating ethernet cables and understanding the importance of proper cable management.

I found the orientation session to be highly effective in introducing us to essential networking concepts and tools. The practical exercises helped reinforce theoretical knowledge and build confidence in performing tasks related to network engineering.

Moving forward, I plan to apply the skills and techniques learned during the orientation session to address real-world network connectivity issues effectively.

Tasks

1) Internet Connectivity Problems at School of Education

Today, I was tasked with resolving internet connectivity issues at the School of Education in a specific office. After tracing the source of the problem, I identified a faulty Ethernet cable leading from the switch rack to the office. Troubleshooting the connectivity issue allowed me to apply the cable termination techniques

learned during the orientation session. I gained practical experience in replacing ethernet cables and learned the importance of proper cable labeling for easier identification in the future. Despite facing challenges in identifying the faulty cable due to poor labeling, I successfully replaced it and restored internet connectivity to the office.

This experience highlighted the importance of thorough cable management practices for maintaining a reliable network infrastructure. I will ensure to label cables accurately to facilitate easier troubleshooting and maintenance of network connections.

2) Internet Connectivity Problems at the Assistant Dean's Office

Today, I addressed internet connectivity issues at the Assistant Dean's office. After locating the access point within the office, I estimated the appropriate cable length and executed the cable termination process using the 568B configuration. During the cable termination process, I encountered a challenge when I noticed uneven cutting of the cables, leading to issues with attaching connectors. I learned the importance of precision in cable cutting to ensure successful connectivity. Despite the initial setback, I successfully rectified the issue by using new connectors and ensuring proper cable attachment. This experience emphasized the need for attention to detail in cable termination tasks to avoid connectivity issues. I will double-check cable cutting to ensure uniformity and strive for precision in all cable termination tasks to maintain optimal network performance.

Week 2

1) Internet Connectivity Problems Registrar's Office

Today, I tackled internet connectivity issues at the Registrar's Office. Upon investigation, I discovered connectivity issues stemming from user error on personal devices and a loose connector at the Residents Engineer office. Resolving the connectivity issues required a combination of troubleshooting personal devices and inspecting network hardware. I gained valuable experience in diagnosing and resolving connectivity issues caused by both user error and physical hardware problems. Despite the challenges presented by user error, I successfully restored internet connectivity to the Registrar's Office by addressing the identified issues. This experience underscored the importance of thorough investigation and attention to detail in resolving network connectivity problems. I will continue to

apply a systematic approach to troubleshooting connectivity issues, ensuring prompt and effective resolution to maintain optimal network performance.

2) Internet Connectivity Problems School of Education and Veterinary Medicine

Today, I addressed internet connectivity problems at the School of Education and Veterinary Medicine.The issues were traced back to lose connections at both the switch and computer ends of ethernet cables. Troubleshooting the connectivity problems required careful inspection of network hardware and reseating of ethernet cables. I applied the cable termination techniques learned during orientation to ensure secure connections. Despite the challenges posed by multiple loose connections, I successfully rectified the issues and restored internet connectivity to the affected areas. This experience highlighted the importance of meticulous cable management to prevent connectivity issues. I will emphasize the importance of regular inspections and maintenance to identify and address loose connections promptly, thereby minimizing network downtime.

3) Internet Connectivity Problems School of Education and Academic Office

Today, I tackled internet connectivity problems at the School of Education and Academic Office. Upon investigation, I identified and resolved connectivity issues caused by loose connections and improper cable management. Troubleshooting the connectivity issues involved inspecting network hardware and reseating ethernet cables to ensure secure connections. I applied the lessons learned from previous tasks to streamline the troubleshooting process. Despite the challenges posed by loose connections and cable management issues, I successfully restored internet connectivity to the affected areas. This experience reinforced the importance of proactive maintenance to prevent recurring connectivity issues. I will continue to prioritize regular inspections and maintenance to uphold a reliable network infrastructure and minimize downtime in academic offices.

4) Internet Connectivity Problems Biology Department Room 405

Today, I addressed internet connectivity problems in the Biology Department Room 405. Upon investigation, I discovered issues with IP address assignment and restarted the access point to restore LAN and Wi-Fi connectivity. Troubleshooting

the connectivity issues required a combination of network diagnostics and hardware resets. I utilized my knowledge of network protocols to identify and address IP address assignment issues. Despite the challenges posed by IP address assignment issues, I successfully restored LAN and Wi-Fi connectivity to Room 405.

This experience underscored the importance of thorough network diagnostics in resolving connectivity issues. I will continue to refine my troubleshooting skills and leverage network diagnostics tools to expedite the resolution of connectivity problems, ensuring minimal disruption to network services.

5) Internet Connectivity Problems Dean's Office Natural Science and Cable Replacement Accounts at Natural Science

Today, I tackled internet connectivity problems at the Dean's Office Natural Science and Accounts office at the Natural Science department. I implemented a temporary solution by relocating the access point and conducting a cable replacement at both locations. Addressing the connectivity issues involved relocating network hardware and replacing faulty cables to restore internet connectivity. I applied my practical knowledge of network infrastructure to implement effective temporary solutions. Despite the challenges posed by faulty hardware, I successfully restored internet connectivity to both the Dean's Office and Accounts office at the Natural Science department. This experience highlighted the importance of adaptability in troubleshooting network issues. I will continue to prioritize quick and effective solutions to minimize downtime and ensure uninterrupted network services for departmental operations.

Week 3

1) Industrial Break - Festive Season

The university observed an industrial break during Week 3, coinciding with the festive season of December. No internship-related activities were scheduled during this period.

Week 4

1) Industrial Break - Festive Season and New Year

Week 4 continued the industrial break, aligning with the festive season and the start of the new year. Similar to Week 3, no internship-related activities were scheduled during this time.

Conclusion

December witnessed successful resolution of various internet connectivity issues across different departments and offices. The orientation session provided interns with foundational knowledge and practical skills necessary for network engineering tasks. Moving forward, efforts will continue to ensure a reliable network infrastructure and seamless connectivity within the university environment.

5.2) Month 2 - January 2024

Tasks

Week 1

1) Internet Connectivity Problems at Accounts Payable Central Admin

Today, I encountered internet connectivity problems at the Accounts Payable Central Admin. Upon investigation, I discovered issues with the switch and cabling behind it, which were causing the connectivity issues. Resolving the connectivity issues involved restarting the switch and adjusting the cabling to ensure secure connections. I applied the troubleshooting techniques learned during orientation to identify and address the root cause of the problem. Despite the challenges posed by the switch and cabling issues, I successfully restored internet connectivity to the Accounts Payable Central Admin. This experience highlighted the importance of proactive maintenance to prevent network disruptions. Moving forward, I will continue to prioritize regular inspections and maintenance to uphold a reliable network infrastructure and minimize downtime in administrative offices.

2) Internet Connectivity Problems at Transport Office

Today, I addressed internet connectivity problems at the Transport Office. Upon investigation, I identified a loose ethernet cable as the root cause of the

connectivity issues. Rectifying the connectivity issues involved replacing the loose ethernet cable with a secure connection. I applied the cable termination techniques learned during orientation to ensure a proper connection. Despite the challenges posed by the loose ethernet cable, I successfully restored internet connectivity to the Transport Office. This experience underscored the importance of meticulous cable management to prevent network disruptions. I will emphasize the importance of securing ethernet cables properly to prevent recurring connectivity issues in office environments.

3) Internet Connectivity Problems at DOSA

Today, I encountered internet connectivity problems at DOSA. Despite attempting to resolve the connectivity issues, a power outage interrupted the process, preventing a complete resolution. Despite the challenges posed by the power outage, I attempted to troubleshoot and resolve the connectivity issues. However, the outage disrupted the troubleshooting process, preventing a conclusive resolution. Despite the challenges posed by the power outage, I remained proactive in attempting to resolve the connectivity issues. This experience underscored the importance of adaptability in navigating unforeseen challenges in network troubleshooting. I will be prepared to adapt to unexpected challenges such as power outages, ensuring a swift and effective response to minimize network downtime.

4) Internet Connectivity Problems at Geography Office

Today, I addressed internet connectivity problems at the Geography Office. Upon investigation, I discovered issues with the switch and connector, which were causing the connectivity issues. Resolving the connectivity issues involved powering on the switch and replacing the faulty connector to ensure a secure connection. I applied the troubleshooting techniques learned during orientation to identify and address the root cause of the problem. Despite the challenges posed by the faulty switch and connector, I successfully restored internet connectivity to the Geography Office. This experience highlighted the importance of thorough inspection and troubleshooting to ensure network reliability. I will continue to prioritize regular inspections and maintenance to uphold a reliable network infrastructure and minimize downtime in academic offices.

5) Internet Connectivity Problems at The School of Veterinary in Different Offices

Today, I tackled internet connectivity problems at The School of Veterinary in Different Offices. Upon investigation, I discovered unauthorized routers causing network integrity issues. Resolving the connectivity issues involved issuing a memorandum to disconnect the unauthorized routers, restoring network integrity. I applied my knowledge of network security protocols to ensure compliance with network policies. Despite the challenges posed by the unauthorized routers, I successfully restored network integrity to The School of Veterinary.

This experience underscored the importance of enforcing network security measures to maintain network integrity. I will continue to prioritize network security measures to prevent unauthorized devices from compromising network integrity and performance.

Events

1) Kick-off Meeting

Conducted a kickoff meeting outlining objectives for the year and raised requests for intern identification.

Week 2

1) Radio Setup at School of Law

Today, I undertook the task of setting up radios at various locations within the School of Law to distribute the 5G network. This involved meticulous planning and execution to ensure optimal coverage and connectivity throughout the premises. Despite the complexities involved in radio setup, I successfully completed the task, contributing to the enhancement of network infrastructure at the School of Law. This experience highlighted the importance of adaptability and problem-solving skills in overcoming technical challenges. Moving forward, I will continue to leverage my skills to contribute effectively to network enhancement projects.

2) Internet Connectivity Problems at Chief Financial Officer's Office

Today, I addressed internet connectivity problems at the Chief Financial Officer's Office. Upon investigation, I identified issues with the cable connection, which were causing the connectivity issues. Resolving the connectivity issues involved reassigning the cable to a different port on the patch panel and connecting it to a different switch. Despite the challenges posed by the cable connection issues, I

successfully restored internet connectivity to the Chief Financial Officer's Office. This experience highlighted the importance of meticulous troubleshooting and attention to detail in resolving network issues. In future tasks, I will continue to prioritize thorough diagnostics to ensure swift and effective resolution of connectivity issues.

3) Permanent Fix for Natural Sciences Dean's Office

Today, I provided a permanent fix for internet connectivity issues at the Natural Sciences Dean's Office. This involved installing a 5G router and repositioning equipment to optimize network performance and stability. Despite the complexities involved in the installation process, I successfully implemented the permanent solution, ensuring reliable internet connectivity for the Dean's Office. This experience underscored the importance of proactive measures in addressing recurring network issues. Moving forward, I will continue to prioritize permanent solutions to enhance network reliability and performance across departments.

4) Faulty Cable in Geography Head of Department Office

Today, I addressed a faulty cable issue at the Geography Head of Department Office. Upon investigation, I identified a faulty cable connection, which was causing connectivity issues. Resolving the issue involved installing a new port to address the faulty cable connection. Despite the challenges posed by the faulty cable, I successfully restored internet connectivity to the Geography Head of Department Office. This experience highlighted the importance of regular maintenance and prompt resolution of network issues to minimize downtime. In future tasks, I will continue to prioritize proactive measures to maintain network integrity and performance.

Week 3

1) Internet Connectivity Problems at School of Law Offices, Education Department

Today, I tackled internet connectivity problems at the School of Law Offices, specifically in the Education Department. Upon investigation, I identified issues with the switch, which were causing the connectivity problems. To resolve the issue, I performed a restart of the switch, successfully restoring internet

connectivity to the affected offices. This experience underscored the importance of swift action in addressing network issues to minimize disruption to organizational activities. Moving forward, I will continue to prioritize timely troubleshooting to ensure seamless network operations.

2) Internet Connectivity Problems at Dean of Students

Today, I addressed internet connectivity issues at the Dean of Students' office. Upon inspection, I discovered a damaged port and connector, which were impacting internet access.

To rectify the issue, I replaced the damaged port and connector, ensuring uninterrupted internet access for the Dean of Students' office. This experience highlighted the significance of thorough hardware inspection and maintenance in maintaining network reliability. In future tasks, I will continue to prioritize proactive measures to mitigate potential network disruptions.

3) Internet Connectivity Problems at Head of Physics Department Office

Today, I resolved internet connectivity problems at the Head of Physics Department Office. Upon investigation, I identified a faulty cable connection as the root cause of the connectivity issues. To restore connectivity, I replaced the faulty cable, ensuring seamless internet access for the Head of Physics Department Office. This experience emphasized the importance of systematic troubleshooting and effective communication in resolving network issues. Moving forward, I will continue to apply best practices to address network challenges promptly and efficiently.

Events

1) Consultation Meeting with ZAMREN Executives

Today, I participated in a consultation meeting with ZAMREN executives to discuss network downtime issues and propose solutions for network segmentation and talked about the use of tools such as cacti and smokeping. During the meeting, I actively contributed ideas and suggestions to enhance network reliability and performance. Engaging with industry professionals provided valuable insights into emerging trends and best practices in network management. This experience reinforced the importance of collaboration and knowledge-sharing in addressing complex network challenges. In future endeavors, I will leverage the knowledge

gained from such interactions to drive continuous improvement in network infrastructure and operations.

Week 4

1) Internet Connectivity Problems at Psychology Offices, School of Humanities

Today, I addressed internet connectivity problems at the Psychology Offices in the School of Humanities. After conducting thorough testing and configuration of a new switch, I successfully resolved potential causes of malfunction, restoring stable internet access to the affected offices.

This experience highlighted the importance of systematic troubleshooting and effective equipment configuration in resolving network issues. Moving forward, I will continue to apply meticulous attention to detail in diagnosing and resolving network challenges to ensure seamless connectivity for organizational activities.

2) Internet Connectivity Problems at Secretary of the Dean of Natural Science's Office

Today, I resolved internet connectivity problems at the Secretary of the Dean of Natural Science's Office. Upon inspection, I identified a loose uplink connection as the root cause of the connectivity issues. To ensure stable internet access, I promptly replaced the loose uplink connection, restoring uninterrupted connectivity to the office. This experience underscored the significance of regular equipment maintenance and inspection in maintaining network reliability. In future tasks, I will remain vigilant in identifying and addressing potential points of failure to minimize network disruptions.

3) Printer Setup at Account Office, School of Mines

Today, I completed the setup of a printer at the Account Office in the School of Mines. The task involved setting up a switch for printer sharing and internet access, which included cable fabrication and setup completion. Through meticulous planning and execution, I ensured seamless integration of the printer into the network infrastructure, enabling efficient printing capabilities for the Account Office. This experience reinforced the importance of meticulous planning and attention to detail in implementing network solutions. In future projects, I will continue to prioritize thorough preparation and execution to deliver optimal outcomes for network operations.

Conclusion

The month of January saw significant progress in resolving various internet connectivity issues across different departments and offices. Despite challenges such as faulty cables, damaged ports, and power outages, diligent efforts were made to ensure stable network operations. Moving forward, ongoing tasks will continue to be addressed to maintain a reliable network infrastructure.

5.3) Month 3 - January 2024

Tasks

Week 1

1) Cable Installation School of Law (Education)

Today, I began my week by installing a cable at the School of Law (Education), connecting the cabinet in the senior admin officer's room (314) to the secretary's office (317). This task required meticulous attention to detail to ensure proper cable installation and connectivity. As I navigated through the installation process, I gained valuable hands-on experience in cable installation techniques, enhancing my proficiency in network infrastructure setup.

2) Cable Loop at School of Psychology Senior Lecturer's Office

In continuation of my tasks, I encountered a cable loop issue at the School of Psychology Senior Lecturer's Office. Using a cable tester, I swiftly identified and addressed the cable loop, resolving connectivity issues for the senior lecturer's office. This experience underscored the importance of diagnostic tools in troubleshooting network problems, further refining my troubleshooting skills.

3) Connectivity Issues - School of Law (Education) Senior Admin

Today, I tackled connectivity issues at the School of Law (Education) Senior Admin office. By disconnecting the uplink at the switch and addressing a loop caused by two uplinks, I successfully resolved the connectivity issues. This task required quick thinking and problem-solving skills to diagnose and rectify the network loop efficiently. Through this experience, I gained insight into the

complexities of network configurations and learned effective strategies for resolving connectivity issues.

4) Room 400, School of Education

In my ongoing efforts to ensure network stability, I addressed a malfunctioning switch in Room 400 at the School of Education. By restarting the switch and meticulously unplugging and reconnecting all cables, I restored functionality to the network in Room 400. This task reinforced the importance of systematic troubleshooting and methodical approach in resolving network malfunctions, enhancing my technical proficiency in network maintenance.

5) Room 509, Lectures LSSE, School of Education

Continuing my tasks, I replaced a damaged uplink cable in Room 509 at the School of Education, restoring connectivity for lectures LSSE. This task required precision and attention to detail to ensure proper cable replacement and seamless network connectivity. Through this hands-on experience, I further honed my skills in cable management and network troubleshooting, preparing me for more complex challenges in the future.

6) ZAMREN - UTP Telephone Cable

Today, I ran a telephone cable at ZAMREN, creating a T junction to facilitate telecommunication services. This task involved meticulous planning and execution to ensure proper cable routing and connectivity. As I navigated through the installation process, I gained valuable insights into telecommunication infrastructure setup, expanding my skill set in network installation and configuration.

7) Geography Department

In the Geography Department, I identified and addressed a damaged uplink cable, ensuring uninterrupted network connectivity for departmental activities. This task required keen attention to detail to pinpoint the location of the damaged cable and implement necessary repairs. Through this experience, I developed a deeper understanding of cable infrastructure maintenance, equipping me with valuable skills for maintaining network integrity.

Week 2

1) School of Education Room 203

Today, I encountered connectivity issues at the School of Education Room 203, where the uplink was not connected to the switch.

By swiftly addressing this issue and reconnecting the uplink, I restored seamless network connectivity for Room 203. This task emphasized the importance of meticulous cable management and thorough inspection to ensure optimal network performance.

2) Server Room CICT to Reception CTU

Continuing my tasks, I ran a network cable from the server room in CICT to the reception area in CTU, facilitating seamless connectivity between the two locations. This task required careful planning and execution to ensure proper cable routing and connectivity. Through this experience, I further honed my skills in network infrastructure setup and configuration, preparing me for more complex networking challenges.

3) Installation and Confirmation of Smokeping

Today, I installed Smokeping, a network monitoring tool, and confirmed its functionality. This task involved configuring Smokeping to monitor network latency and packet loss, providing valuable insights into network performance and stability. As I navigated through the installation process, I gained valuable experience in network monitoring and management, enhancing my proficiency in ensuring optimal network performance.

4) Institute of Economic and Social Research (INESOR)

In my ongoing efforts to optimize network infrastructure, I configured a switch for remote management at the Institute of Economic and Social Research (INESOR). Additionally, I brought up the training center switch and assigned a valid ID, ensuring seamless network connectivity for training activities. This task required attention to detail and technical expertise to configure the switch accurately, further refining my skills in network administration and management. Through this experience, I gained valuable insights into network configuration best practices, equipping me with the necessary skills to support robust network operations.

Week 3

1) Continuation at INESOR

Continuing my tasks at INESOR, I focused on configuring the network infrastructure, particularly the remote management setup and assigning valid IDs. This involved meticulous configuration to ensure seamless network connectivity and accessibility for remote management purposes.

Through this process, I deepened my understanding of network configuration principles and enhanced my technical skills in network administration.

2) Salaries Registrar

Today, I addressed connectivity issues at the Salaries Registrar's office by replacing a faulty cable. This task required swift troubleshooting and cable replacement to restore uninterrupted network connectivity. By successfully resolving this issue, I reinforced my troubleshooting skills and demonstrated my ability to resolve network-related issues effectively under pressure.

3) Final Configuration of Smokeping

Continuing with the deployment of network monitoring tools, I completed the final configuration of Smokeping, adding targets and sub-targets to enhance network monitoring capabilities. This involved meticulous configuration to ensure accurate monitoring of network latency and packet loss. Through this task, I gained valuable experience in network monitoring and management, further strengthening my skills in optimizing network performance.

4) Deployment of Computers with Smokeping

Today, I deployed computers equipped with Smokeping in the server room, enhancing network monitoring capabilities and facilitating proactive network management. This task involved careful deployment and configuration of computers to ensure seamless integration with Smokeping. Through this experience, I gained practical insights into deploying network monitoring tools in real-world environments, preparing me for future challenges in network management and administration.

5) Fixing Power Pack Issues and Loose Uplink Cable Connections for Radios

Addressing various network issues across different locations, including the Deputy

VC, CFO, Deputy Registrar, Dean Agriculture, Biology Lab 5th floor, Agriculture Food Science, and GSB Conference 1, I resolved power pack issues and loose uplink cable connections for radios. This task required thorough inspection and troubleshooting to identify and resolve network issues effectively. Through this experience, I further honed my troubleshooting skills and demonstrated my ability to manage diverse network challenges efficiently.

Week 4

1) Insurance Office

Today, I undertook a task at the Insurance Office, where I ran a cable to establish connectivity between the printer and the computer. Additionally, I configured both the computer and printer to ensure seamless operation. This task required meticulous cable management and configuration to optimize printing functionality. Through this experience, I enhanced my skills in network cabling and device configuration, contributing to my overall proficiency in network administration.

2) Wifi Radios Down

Addressing issues with WiFi radios being down, I conducted troubleshooting and remediation measures to resolve the problem. This involved investigating and rectifying issues such as seizing in locations like Population Studies and Education Deans. By identifying and addressing these issues promptly, I demonstrated my ability to troubleshoot and resolve network-related problems efficiently, further refining my problem-solving skills in a real-world network environment.

3) Mashlands Village Misconfigured Radio

At Mashlands Village, I encountered a misconfigured router, which required immediate attention to ensure proper network functionality. To rectify the misconfiguration issues, I reconfigured the router by disabling interface firewall, enabling one accessibility, changing the password, and modifying the WiFi name. This task demanded a comprehensive understanding of router configuration principles and meticulous attention to detail to ensure accurate implementation of the required changes. Through this experience, I expanded my knowledge of router

configuration and troubleshooting techniques, equipping myself with valuable skills for managing network infrastructure effectively.

Conclusion

The month of February showcased continuous efforts in resolving internet connectivity issues, implementing new installations, and ensuring the smooth functionality of network infrastructure. Despite challenges, each task was meticulously addressed to maintain reliable network operations.

5.4) Month 4 - January 2024

Tasks

Week 1

1) Marketing Office - Unidentified Network Issue

Today, I responded to a critical issue reported at the Marketing Office regarding an unidentified network. Through systematic troubleshooting, I identified misconfigurations and physical connection issues, successfully resolving the problem and restoring network functionality. This experience reinforced the importance of meticulous attention to detail and systematic problem-solving in troubleshooting network issues, enhancing my skills in network diagnostics and configuration.

2) H.O.D Government Studies - Slow Internet

Addressing slow internet complaints from the Government Studies Department, I conducted a comprehensive assessment of network performance and bandwidth usage. By identifying and resolving factors contributing to slow speeds, such as network congestion and hardware limitations, I ensured optimal internet connectivity for departmental activities. This task allowed me to apply my knowledge of network optimization techniques in a real-world scenario, further honing my skills in network performance analysis and troubleshooting.

3) Cartography, Geography Department - Internet Connectivity

At the Cartography department of the Geography Department, I encountered internet connectivity issues stemming from hardware malfunctions and configuration errors. Through thorough investigation and troubleshooting, I rectified these issues, ensuring uninterrupted internet access for departmental operations. This experience provided valuable insights into diagnosing and resolving complex network issues, strengthening my problem-solving abilities and technical expertise in network administration.

4) INESO (INSTITUTE OF ECONOMIC AND SOCIAL RESEARCH)

At INESO (INSTITUTE OF ECONOMIC AND SOCIAL RESEARCH), I addressed a critical UPS overload issue by redistributing power load across devices. By optimizing power distribution, I ensured uninterrupted power supply, mitigating the risk of downtime and data loss.

This task required strategic planning and technical expertise in power management, enriching my understanding of network infrastructure resilience and disaster recovery measures.

5) Accounts Office at School of Humanities

In the Accounts Office at the School of Humanities, I resolved an internet connectivity issue in Office 217 by tracing and reconnecting cables. Additionally, I installed a new cable to provide additional connectivity, ensuring seamless access to network resources. This task underscored the importance of effective cable management and infrastructure planning in maintaining a reliable network environment. Through hands-on experience, I refined my skills in cable installation and network expansion, contributing to my overall proficiency in network administration.

6) School of Education Assessment Center

Today, I addressed a connectivity issue at the School of Education Assessment Center. By reattaching a cable and restarting the switch, I successfully restored network connectivity, enabling seamless reconnection to network resources. This task highlighted the importance of systematic troubleshooting and quick response in resolving network issues to minimize disruption to operations. Additionally, it provided an opportunity to apply practical troubleshooting techniques and reinforce my understanding of network infrastructure components and their interdependencies.

Week 2

1) Department of Agric Engineering

Today, I undertook the task of relocating a radio and switch at the Department of Agric Engineering. This project aimed to improve network coverage and reliability within the department. After consulting with department staff and assessing the physical layout of the area, we determined a more suitable location for the equipment. The relocation process involved careful planning to ensure minimal disruption to ongoing activities while maximizing network performance.

2) Deputy Vice Counselors' Office

In the Deputy Vice Counselors' Office, I encountered connectivity issues that required immediate attention.

Upon inspection, I discovered faulty wall ports contributing to the network instability. To address this issue, I replaced the faulty ports and ran new UTP and telephone cables to establish robust connections. Proper cable management was crucial to prevent future issues and maintain network integrity.

3) Checking of Configurations on a Cisco Switch

Today's task involved verifying configurations on a Cisco switch, a fundamental aspect of network management. By examining VLAN Transfer Protocol, IP addresses, and software versions, I gained insights into the intricate workings of network infrastructure. This hands-on experience enhanced my understanding of configuration best practices and the importance of maintaining standardized settings for efficient network operation.

4) School of Education

At the School of Education, I addressed multiple connectivity issues in Room 510. These issues were impacting productivity and hindering the smooth operation of educational activities. By conducting a thorough assessment of the existing cabling infrastructure, I identified areas for improvement and optimized the network layout to enhance reliability and performance. Clear communication with end-users was essential throughout the process to ensure their needs were met effectively.

5) Library Technical Service

Today, I tackled internet access failures reported in several offices within the Library Technical Service department. This task required a systematic approach to

troubleshooting, starting with identifying the root causes of the connectivity issues. Through effective communication with end-users and meticulous testing of network components, I was able to pinpoint and resolve the issues efficiently. This experience underscored the importance of proactive network maintenance and timely technical support in ensuring uninterrupted service delivery.

6) Accounts Payable

In the Accounts Payable department, I encountered internet and printing issues that were affecting daily operations. By employing diagnostic tools and troubleshooting techniques, I identified the underlying causes of the problems and implemented appropriate solutions.

This experience highlighted the critical role of IT support in maintaining the smooth functioning of organizational processes. Effective problem-solving skills and a customer-centric approach were essential in resolving the issues promptly and minimizing disruption to workflow.

Week 3

1) Natural Sciences Department Labs

Today's task involved addressing internet connectivity issues in the Natural Sciences Department Labs. Upon investigation, I identified network disruptions affecting lab activities. By systematically troubleshooting the network infrastructure, I was able to pinpoint the source of the problem and restore network access swiftly. This experience reinforced the importance of timely technical support in maintaining uninterrupted operations in academic environments.

2) Council Office

At the Council Office, I encountered internet and Wi-Fi connectivity issues that required immediate attention. By conducting a thorough assessment of the network setup, I identified and addressed underlying issues affecting network stability. Clear communication with office personnel was crucial in ensuring a comprehensive understanding of their requirements and expectations. By implementing effective solutions, I was able to restore stable network connections, enabling seamless communication and collaboration within the office.

3) Transport Yard

Today, I focused on restoring power supply to the switch at the Transport Yard. The switch outage was disrupting network connectivity for yard personnel, impacting operational efficiency. By promptly addressing the power supply issue and ensuring proper installation, I was able to restore network connectivity, facilitating smooth operations at the yard. This experience highlighted the importance of proactive maintenance and timely intervention in preventing downtime and minimizing disruptions in critical operational areas.

4) Old Agric Office

In the Old Agric Office, I replaced a faulty cable to restore internet connectivity. The connectivity issue was impeding productivity in the office, necessitating immediate resolution.

Through careful diagnosis and replacement of the faulty cable, I was able to restore network access, enabling office personnel to resume their tasks without further interruption. This experience underscored the significance of regular network maintenance and troubleshooting in ensuring seamless connectivity and productivity in workplace environments.

5) Library - Connection of a New Special Education Studying Lot

Today, I facilitated the connection of a new room to the network infrastructure at the library, catering to the needs of special education students. By extending the network coverage to the designated area, I ensured that students had access to essential online resources and educational materials. Clear communication with library staff and stakeholders was essential in understanding their requirements and tailoring the network solution to meet their specific needs effectively.

6) Academic Office, Room 14 and Room 8

In the Academic Office, I addressed internet connectivity problems in specified rooms, optimizing network performance for office users. By conducting a thorough assessment of the network setup and troubleshooting connectivity issues, I was able to restore seamless access to online resources and communication tools. Effective communication with office staff was crucial in ensuring that their needs were met efficiently, contributing to a productive work environment.

Week 4

1) Council Office

Today, I tackled internet connectivity issues at the Council Office. Upon arrival, I identified loose cables contributing to network disruptions. By reestablishing secure connections and rectifying cable management, I restored network functionality efficiently. Effective communication with office personnel ensured a comprehensive understanding of their needs, facilitating prompt resolution of connectivity issues.

2) HSS Switch Malfunction

At the HSS department, I encountered a malfunctioning switch affecting network connectivity. By promptly replacing the faulty switch and power supply, I restored network functionality, minimizing downtime and disruptions. Clear communication with department staff was crucial in coordinating the replacement process and ensuring minimal impact on daily operations.

3) HSS Development Studies

Today's task involved addressing disconnected ports in the HSS Development Studies department. By firmly reconnecting the ports and verifying network connections, I ensured uninterrupted network access for department personnel. This experience underscored the importance of thorough inspection and troubleshooting in resolving connectivity issues effectively.

4) HSS Accounts Office Post Graduate

In the postgraduate Accounts office, I resolved internet connectivity issues by reestablishing disconnected lines. By conducting a comprehensive assessment of network infrastructure and addressing connectivity issues promptly, I restored stable internet access for office operations. Effective communication with office staff facilitated a smooth resolution process, highlighting the importance of collaboration in addressing technical challenges.

5) Dean's Wi-Fi, School of Mines

Today, I diagnosed and resolved non-functional Wi-Fi issues in the Dean's office at the School of Mines. By conducting thorough troubleshooting and implementing appropriate solutions, I ensured reliable Wi-Fi connectivity for office staff. Clear communication with stakeholders was essential in understanding their requirements and tailoring the network solution to meet their specific needs effectively.

6) Student Finance PC

At the Student Finance department, I investigated and resolved internet connectivity issues affecting a PC.

By identifying and addressing factors contributing to the connectivity problem, I restored internet access for the user, enabling seamless workflow. This experience reinforced the importance of attention to detail and systematic troubleshooting in resolving technical issues promptly.

7) Purchasing Offices and Registrar's Office

Today, I focused on resolving internet connectivity issues affecting the Purchasing Offices and Registrar's Office. Upon investigation, it was determined that the root cause of the problem was a malfunctioning switch. To ensure uninterrupted access for office operations, I promptly replaced the faulty switch with a functional one.

By conducting thorough testing and verification of network connections, I confirmed the successful restoration of internet connectivity in both offices. Effective communication with office personnel facilitated a seamless resolution process, highlighting the importance of collaboration in addressing technical challenges. This experience emphasized the critical role of proactive maintenance and swift problem-solving in maintaining a reliable network infrastructure to support organizational activities.

Conclusion

The month of March witnessed the resolution of various internet connectivity issues across different departments and offices though we faced some challenges as addressed above. Diligent efforts were made to address hardware malfunctions, configuration errors, and power supply issues. Moving forward, ongoing tasks will continue to be addressed to maintain a reliable network infrastructure.

Challenges Faced

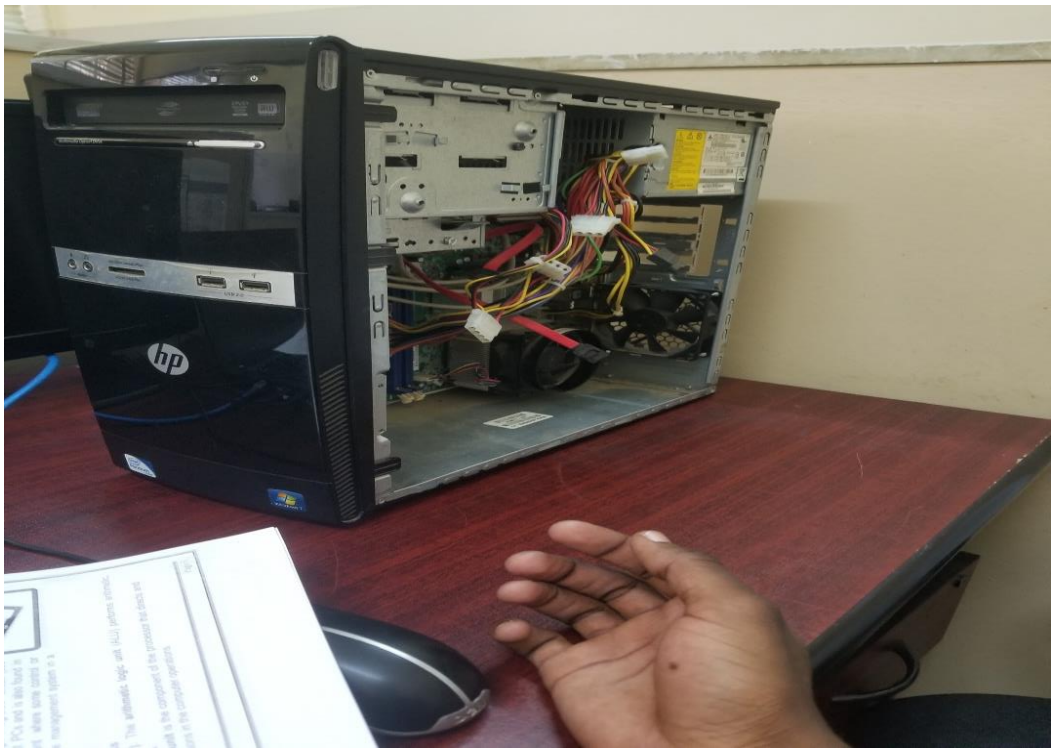
Towards the end of the internship, we encountered a shortage of RJ-45 connectors and UTP cable, which posed challenges in resolving connectivity issues efficiently. Despite this constraint, efforts were made to prioritize critical issues and utilize available resources effectively to mitigate the impact on network operations. Measures were taken to procure additional supplies and optimize existing resources to ensure continued support for network infrastructure.

6) Work Samples

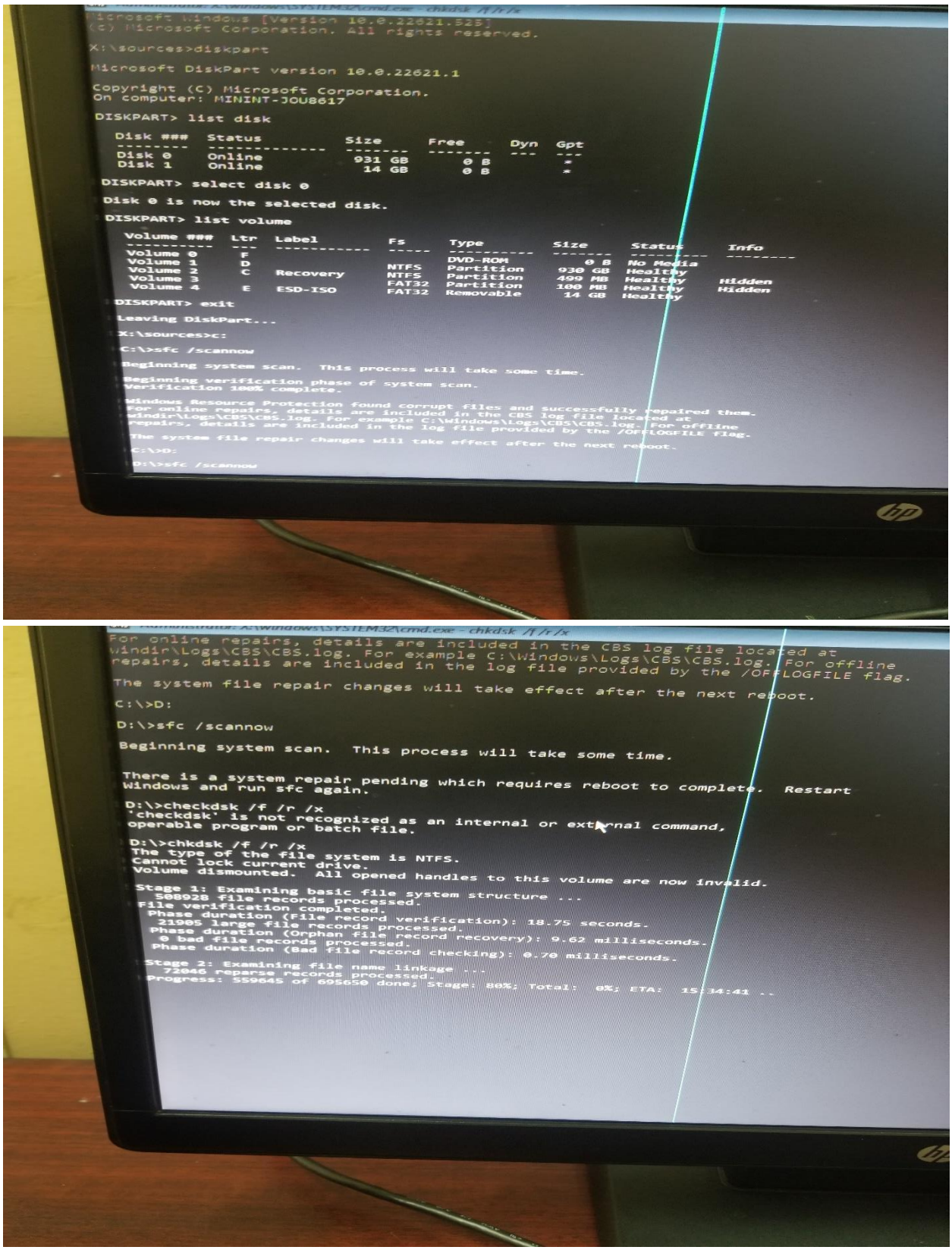
During my internship at the Centre for Information and Communication Technologies (CICT) at the University of Zambia, I had the opportunity to engage in a diverse range of projects and tasks, allowing me to apply theoretical knowledge to real-world scenarios and hone my skills in various areas of interest. In this section, I present two work samples that showcase my contributions and accomplishments during my internship. These samples illustrate my ability to effectively execute tasks, collaborate with team members, and deliver high-quality outcomes in a professional setting. From creating informative articles to designing innovative solutions, each work sample reflects my dedication, creativity, and commitment to excellence.

6.1) Troubleshooting an Infected Hard Disk Drive

This work sample showcases the process of removing an infected hard disk drive (HDD) from a computer and subsequently fixing it using commands in boot mode, prior to the computer loading its operating system (OS). This work sample showcases the process of removing an infected hard disk drive (HDD) from a computer and subsequently fixing it using commands in boot mode, prior to the computer loading its operating system (OS).



Removal of HDD

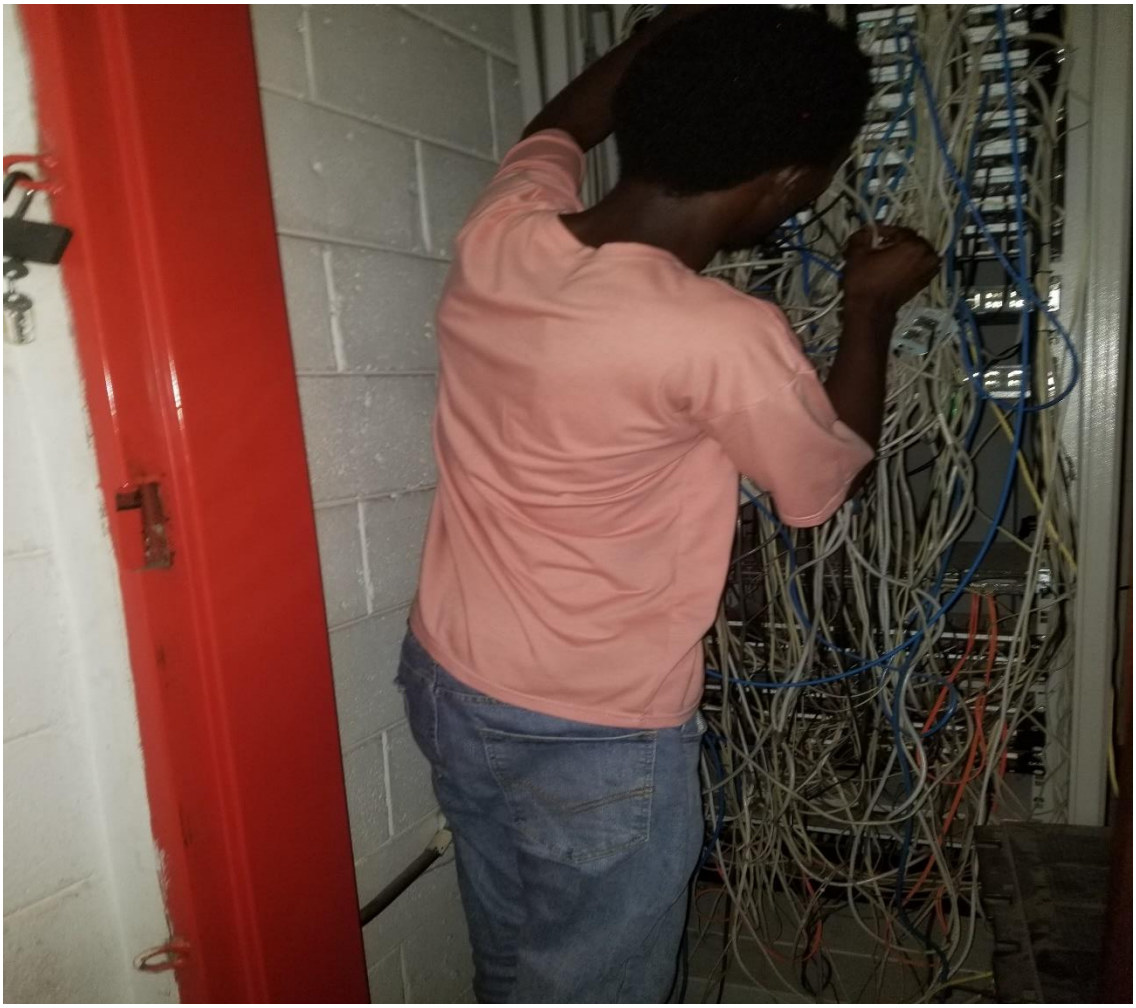


Running of Commands in Boot Mode

As an intern, I was tasked with diagnosing and resolving hardware and software issues encountered by users. In this instance, I played a key role in identifying the problem with the infected HDD and implementing the necessary steps to repair it.

6.2) Cable Management in the POP Room and Cabinet

This work sample illustrates the management of cables in the Point of Presence (POP) room and cabinet within an office environment. Responsibilities included troubleshooting connectivity issues by ensuring proper connections between wall ports and the corresponding switch ports on the patch panel. This involved patching cables from switches to designated ports on the patch panel, ensuring secure and firm connections. Additionally, routine cable management tasks were performed to maintain organization and prevent potential issues.



Cable management in a Pop Room

Cable management in a Cabinet

As part of my internship duties, I was assigned tasks related to network infrastructure management. This included managing cables within the POP room and cabinet to address connectivity issues reported by office users. My role involved identifying faulty connections, securing loose cables, and ensuring efficient cable routing to optimize network performance.

6.3) Utilization of Tools in Network Infrastructure Management

This work sample demonstrates the utilization of various tools essential for network infrastructure management.

Tools such as drilling machines were employed for mounting WiFi radios, wall ports, and running cables between offices.

The crimping tool was utilized for attaching RJ-45 connectors to UTP cables, ensuring secure connections.

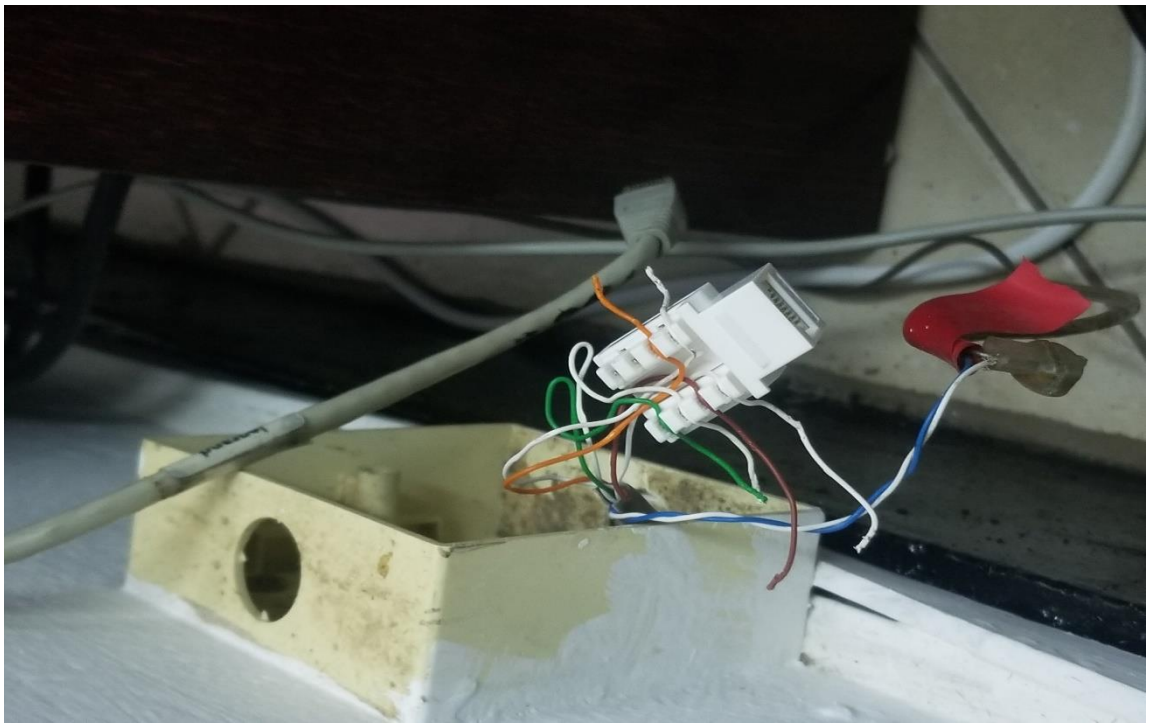
Additionally, punch-down tools were used for installing wall ports efficiently.

A diverse range of cables including UTP, telephone, and fiber cables were available for network installations and repairs.

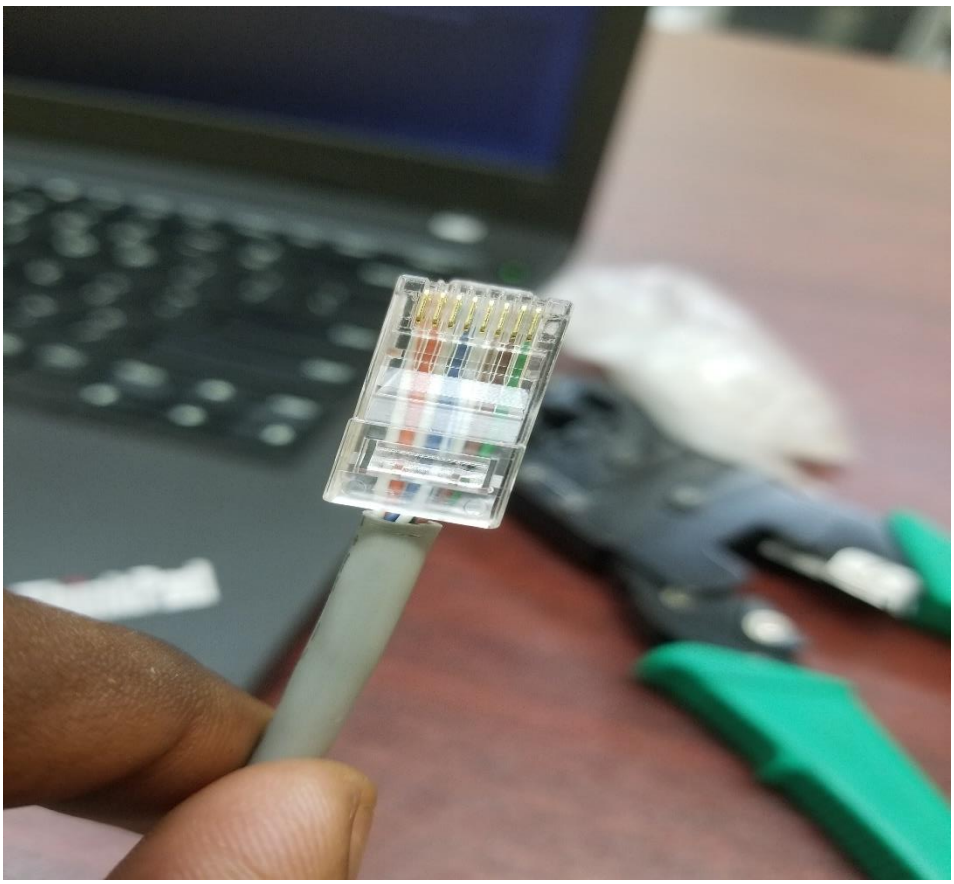
Cable testers played a crucial role in identifying faulty cables and tracing connections within complex network environments.

Drilling Machine

White Punch down tool and Green Crimping tool



Replaced wall port using a punch down tool



RJ-45 Connector attached to a UTP cable using a Crimping tool

Telephone and Fiber Cable

UTP Cable

Cable Testers

As part of my internship responsibilities, I was involved in network infrastructure management tasks which required the use of specialized tools. I utilized drilling machines, crimping tools, punch-down tools, and cable testers to install, maintain, and troubleshoot network components effectively. My role included ensuring the proper functioning of network equipment and connectivity across various office locations within the organization.

6.4) Mounting WiFi Radios at DRGS

The task involved installing WiFi radios in strategic locations within the DRGS premises to ensure optimal wireless network coverage. Utilizing drilling machines, WiFi radios were securely mounted on walls or ceilings, considering factors such as signal strength and coverage area. Careful planning and precise installation techniques were employed to achieve reliable WiFi connectivity throughout the DRGS facility.

POE Wi-Fi Radio

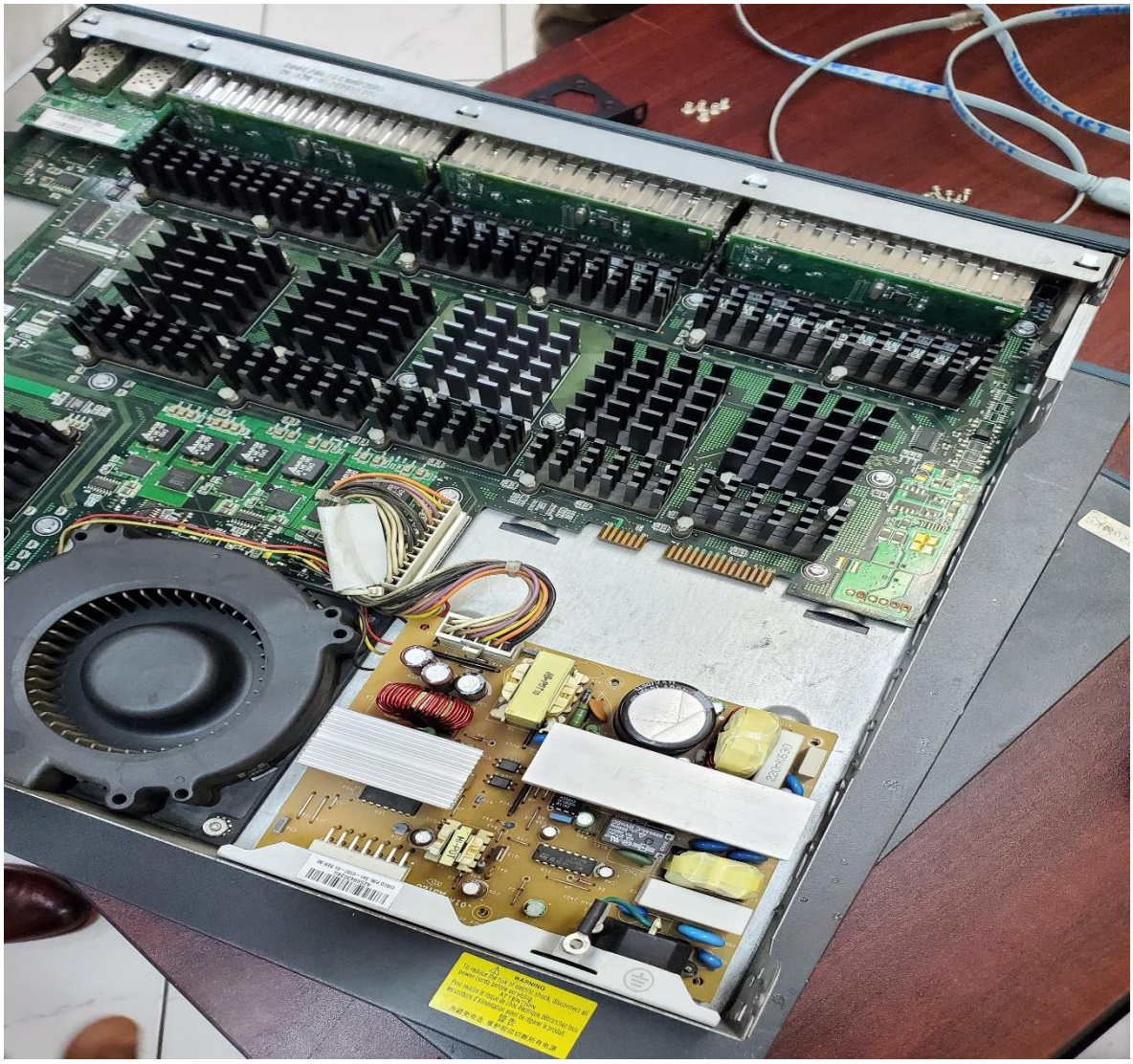
Wi-Fi Radios mounted at strategic point

As part of my internship responsibilities, I was assigned the task of mounting WiFi radios at DRGS to enhance wireless network infrastructure. My role involved coordinating with network engineers to identify optimal locations for WiFi radio installation, conducting site surveys to assess signal strength, and using drilling machines to mount the radios securely. By completing this task efficiently, I contributed to improving WiFi connectivity and enhancing network performance within the DRGS premises.

6.5) Replacement of Power Unit in a Cisco Switch

The task involved diagnosing the issue, opening the Cisco switch, removing the faulty power unit, and replacing it with a new component. Additionally, thorough cleaning of the internal components was conducted to ensure optimal functionality and prevent further damage. The process required careful handling of sensitive electronic equipment and adherence to safety protocols to mitigate risks associated with electrical components.

Cleaning Stage



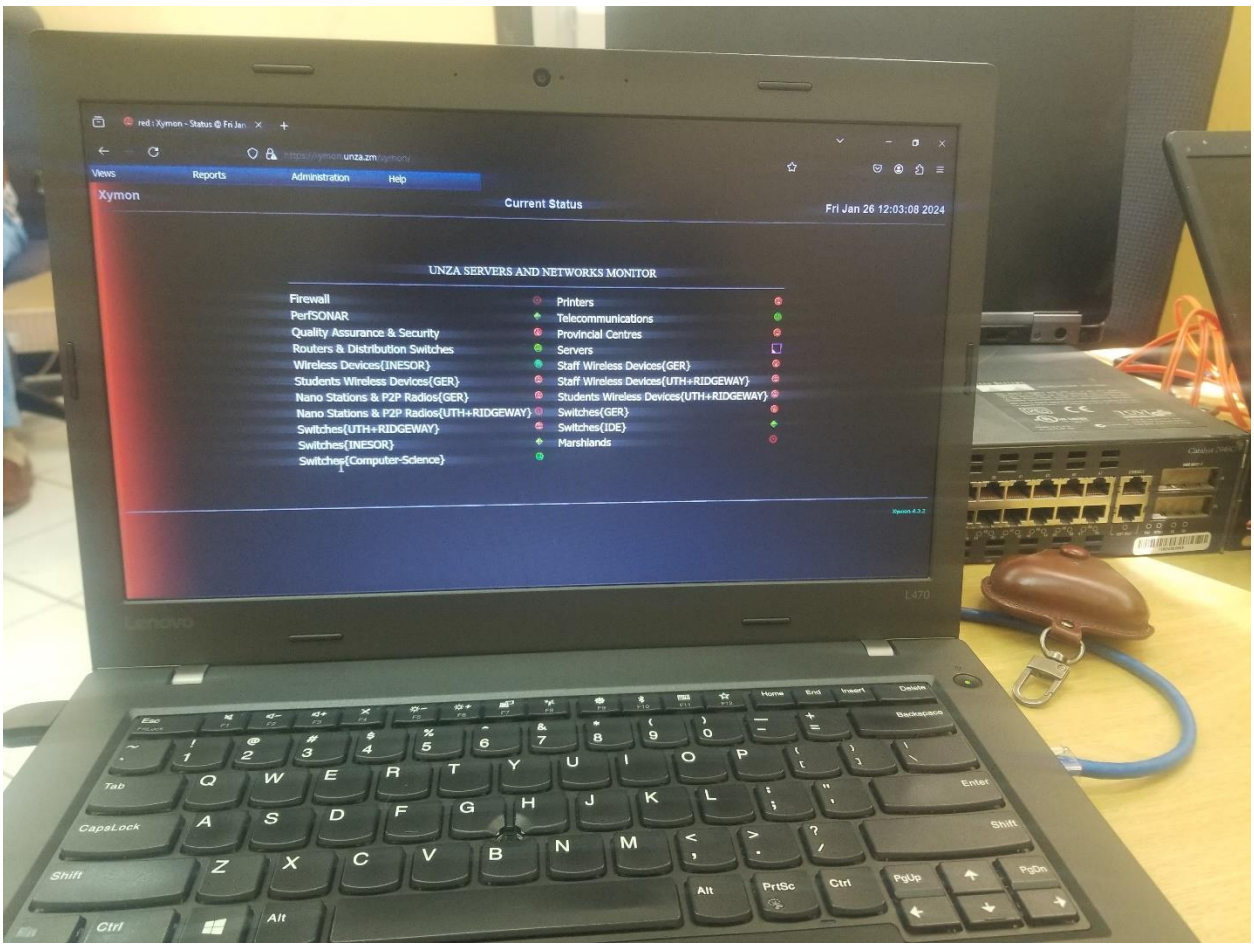
Replacement of the Power Unit

The task involved diagnosing the issue, opening the Cisco switch, removing the faulty power unit, and replacing it with a new component. Additionally, thorough cleaning of the internal components was conducted to ensure optimal functionality and prevent further damage. The process required careful handling of sensitive electronic equipment and adherence to safety protocols to mitigate risks associated with electrical components.

6.6) Utilization of Xymon Network Monitoring Tool

This work sample illustrates the utilization of Xymon, a comprehensive network monitoring tool, within the University of Zambia (UNZA) environment. Xymon provides real-time insights into the status of network switches, indicating whether they are operational or experiencing downtime.

Additionally, the software offers detailed information such as uptime, downtime, and graphical representations of network performance metrics. It serves as a vital tool for network administrators and authorized personnel to proactively monitor and manage UNZA's network infrastructure.

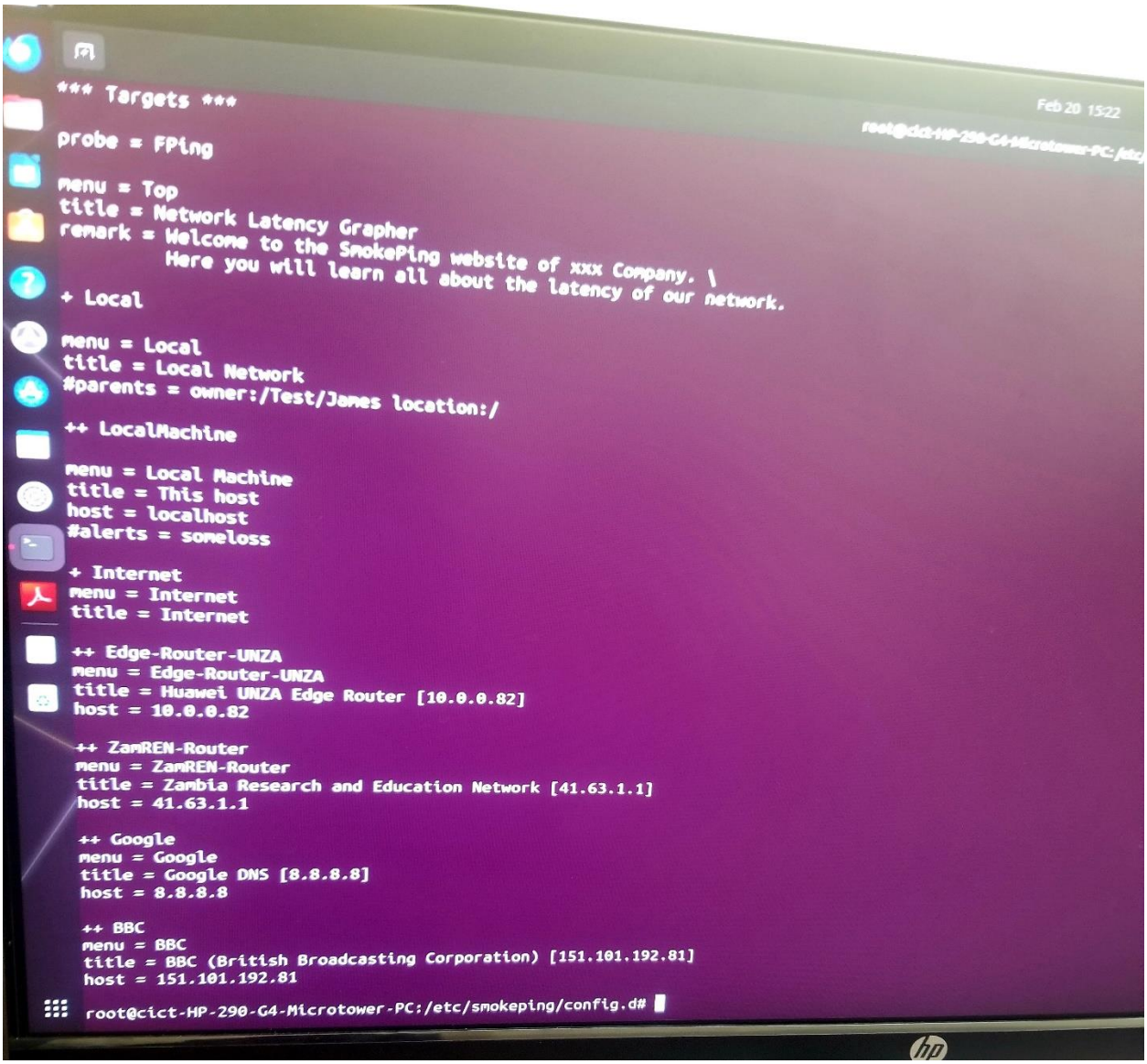


Xymon

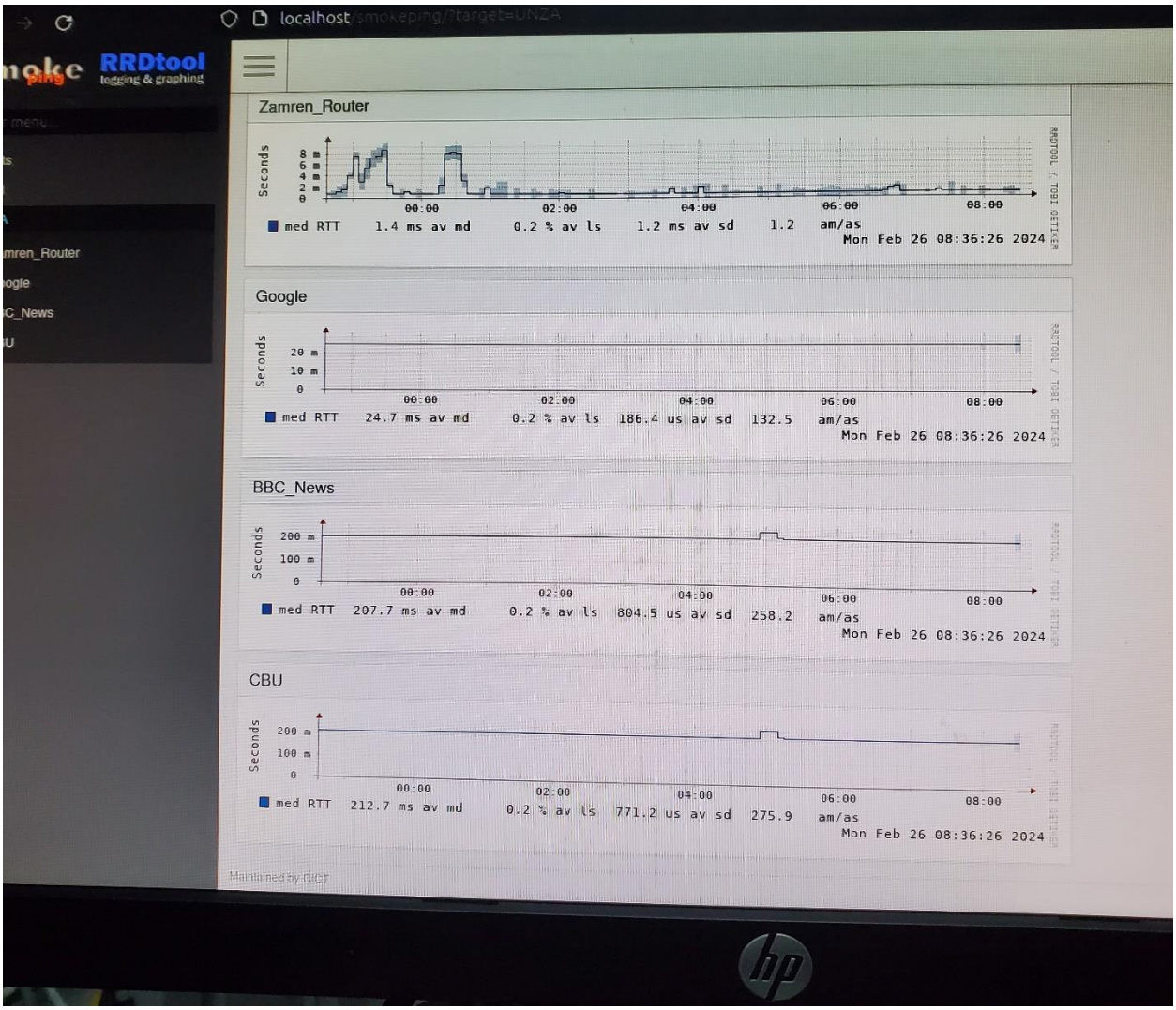
During my internship, I had the opportunity to leverage Xymon for network monitoring within the UNZA local network. As authorized personnel, I utilized the software to monitor the status of switches, assess their operational efficiency, and identify any potential issues affecting network performance. By interpreting the data provided by Xymon, I contributed to maintaining network reliability and addressing connectivity issues promptly. This experience enhanced my skills in network monitoring and management, allowing me to play a proactive role in ensuring the stability and functionality of UNZA's network infrastructure.

6.7) Configuration and Deployment of Smokeping

This work sample showcases the configuration and deployment of Smokeping, a network latency monitoring tool, within the University of Zambia (UNZA) network infrastructure. Smokeping is designed to measure and graph network latency and packet loss, providing valuable insights into network performance and stability. The configuration process involves setting up probes to monitor network connectivity to various targets and configuring alerts for potential issues.



Addition of Targets and Sub-targets



SmokePing Up and Running

During my internship, I was tasked with configuring and deploying Smokeping to enhance network monitoring capabilities at UNZA. My responsibilities included:

1. Installing Smokeping on designated servers within the UNZA network.
2. Configuring Smokeping probes to monitor latency and packet loss to critical network targets, such as servers, switches, and routers.
3. Customizing alert thresholds and notifications to promptly identify and address network performance issues.
4. Integrating Smokeping graphs and reports into existing network monitoring dashboards for easy access and analysis by network administrators.

5. Conducting testing and validation to ensure the accuracy and reliability of Smokeping measurements.

Overall, the successful configuration and deployment of Smokeping contributed to improving network visibility and facilitating proactive management of network performance at UNZA.

6.8) Configuration and Repair of Cisco Switches

This work sample highlights the tasks involved in configuring Cisco switches and performing repairs on faulty units within the University of Zambia (UNZA) network infrastructure. Configuring Cisco switches entails setting up various parameters such as VLANs, port security, and Quality of Service (QoS) settings to optimize network performance and security. Additionally, repairing faulty switches may involve diagnosing hardware issues, replacing damaged components, and conducting preventive maintenance to ensure optimal switch operation.

Cisco Switches

During my internship, I was responsible for configuring network switches, including tasks such as initial setup, implementing security measures, configuring switch ports, and troubleshooting network connectivity issues. Additionally, I assisted in the repair of damaged switches by identifying hardware failures, replacing faulty components, and ensuring proper installation and configuration of replacement parts.

7) Critical Analysis

During my internship at the Centre for Information and Communication Technologies (CICT) at the University of Zambia, I had the opportunity to bridge theoretical concepts with practical experiences, aligning closely with the courses I have undertaken in my academic journey. I applied knowledge from several courses. The following are some of them:

Computer Systems and Computer Architecture

Understanding the foundational aspects of computer systems and architecture provided me with the necessary background knowledge to comprehend the intricate design and operation of network infrastructure components. This knowledge was particularly valuable when configuring network switches and troubleshooting hardware-related issues, such as replacing faulty components.

Operating Systems and Computer Programming

Knowledge of operating systems facilitated my understanding of network management software tools like Xymon and Smokeping. Moreover, programming skills were beneficial when customizing scripts for network monitoring and automation tasks, enhancing efficiency and reliability in network operations.

Information and Network Security

The theoretical understanding of information and network security principles equipped me with the expertise to implement security measures in network configurations. Tasks such as configuring access control lists (ACLs) on switches and conducting security audits aligned directly with the concepts learned in this course, ensuring the confidentiality, integrity, and availability of network resources.

Data Communication and Networks

This course provided a comprehensive understanding of data communication protocols and network architectures, which proved instrumental in configuring and managing network infrastructure effectively. Tasks such as cable management, switch configuration, and troubleshooting network connectivity issues directly applied the principles learned in this course.

IT Project Management

Concepts from IT project management enabled me to approach tasks systematically, ensuring projects were completed within scope, time, and budget constraints. Whether it was mounting Wi-Fi radios, repairing damaged switches, or deploying network monitoring tools like Xymon and Smokeping, effective project management principles ensured successful outcomes.

Overall Analysis of the Organization

CICT operates as a strategic arm of the University of Zambia, responsible for the deployment, management, and maintenance of ICT infrastructure to support teaching, learning, and research activities. The organization's structure encompasses various departments, including Consultancy & Training, Network & Software Support, Quality Assurance and Security, and Systems Development, each playing a crucial role in fulfilling the organization's objectives.

The internship experience provided valuable insights into the practical application of theoretical knowledge gained from academic courses. From configuring network switches to managing cable infrastructure and deploying network monitoring tools, I gained hands-on experience that enhanced my understanding of network management and administration. Additionally, exposure to real-world scenarios enabled me to develop problem-solving skills and adaptability, essential qualities for success in the field of information and communication technologies.

Overall, my internship at CICT was a rewarding experience that not only solidified my theoretical understanding but also provided me with practical skills and insights essential for a successful career in the field of ICT.

8) SWOT Analysis

Conducting a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis provides a comprehensive understanding of an organization's internal dynamics and its external operating environment. In the case of the organization where the internship was conducted, a thorough examination reveals insights into its strategic capabilities, areas for improvement, potential avenues for growth, and external challenges it faces. By identifying these factors, stakeholders can develop informed strategies to capitalize on strengths, address weaknesses, seize opportunities, and mitigate threats, ensuring the organization's sustained success and competitiveness in the dynamic landscape of Information and Communication Technologies (ICTs) and educational services.

Strengths

- ***Strategic Deployment of ICT:*** The organization strategically deploys Information and Communication Technologies (ICTs) for the delivery of education, enhancing teaching, learning, and research.
- ***Comprehensive ICT Infrastructure:*** It provides essential ICT infrastructure and services to meet the strategic objectives of the University of Zambia, housing all critical university systems.
- ***In-House System Development:*** The organization creates systems for the entire university, showing how flexible and creative it is.
- ***Diverse Training Programs:*** It offers a wide range of ICT training services to staff and students, covering various applications such as SPSS, STATA, and Computer Hardware Maintenance.
- ***Consultancy Services:*** The organization provides consultancy services to external clients, generating revenue and enhancing its reputation as an ICT expert.

Weaknesses

- ***Dependency on Internal Development:*** While in-house system development showcases innovation, it may lead to limitations in adopting external technologies and perspectives.
- ***Limited Accessibility:*** Certain services, such as the network monitoring tool 'Xymon,' are accessible only within the UNZA local network, restricting their utility to authorized personnel.

Opportunities

- ***Market Expansion:*** There is an opportunity to expand consultancy services to external organizations, leveraging the organization's expertise in ICT system development, network implementation, and data analysis.
- ***Technological Advancements:*** Continuous advancements in ICT present opportunities for the organization to enhance its services and infrastructure, staying abreast of emerging trends and technologies.

Threats

- ***Cybersecurity Risks:*** With the increasing reliance on digital platforms, there is a growing threat of cybersecurity breaches, which could compromise the confidentiality, integrity, and availability of information.
- ***External Competition:*** Competition from other ICT service providers poses a threat to the organization's market share and reputation, necessitating ongoing innovation and differentiation to maintain a competitive edge.

9) Conclusion

After thorough evaluation and analysis, the organization emerges as a dynamic and innovative entity within the realm of information and communication technologies (ICT). Through its strategic deployment of ICTs, the organization effectively supports the educational, research, and administrative functions of the University of Zambia.

The critical analysis reveals a strong alignment between theoretical concepts and practical experiences during the internship period. Courses such as computer systems, data communication and networks, and information and network security have provided a solid foundation that directly applies to the work environment within the organization.

Furthermore, the SWOT analysis highlights several key aspects of the organization:

Strengths:

- Robust in-house system development capabilities, enabling tailored solutions to meet diverse stakeholder requirements.
- Skilled workforce equipped with knowledge in various areas such as network management, system configuration, and software deployment.
- Strong emphasis on training and skill development, evident through the provision of consultancy and training services to staff and students.

Weaknesses:

- Dependency on internal resources for system development may limit scalability and flexibility in addressing evolving needs.
- Limited access to specialized tools and technologies, potentially hindering the organization's ability to compete with external service providers.

Opportunities:

- Growing demand for ICT services in both educational and corporate sectors, presenting avenues for expansion and revenue generation.
- Collaboration opportunities with external organizations for joint research projects and consultancy services.
- Integration of emerging technologies such as cloud computing and data analytics to enhance service offerings and efficiency.

Threats:

- Rapid technological advancements leading to obsolescence of existing systems and skills, necessitating continuous learning and adaptation.
- Increasing competition from external service providers offering similar ICT solutions, challenging the organization's market position and profitability.

In conclusion, the organization demonstrates a strong commitment to leveraging ICTs for educational advancement and operational efficiency. By addressing its weaknesses and capitalizing on available opportunities, it can further strengthen its position as a leader in the ICT sector while mitigating potential threats to its sustainability and growth.

10) Recommendation

Based on the findings from the critical analysis and SWOT analysis, several recommendations can be proposed to address the identified challenges and capitalize on opportunities for improvement within the organization. These include the following:

1. Enhance Scalability and Flexibility

Invest in diversifying the pool of resources for system development, including partnerships with external vendors or freelance professionals. This will enable the organization to scale its operations more effectively to meet evolving demands.

2. Continuous Skills Development

Implement a structured training program focused on emerging technologies and industry best practices to ensure that employees remain up-to-date with the latest advancements in the field of ICT. This can include certifications and workshops conducted internally or through collaboration with external training providers.

3. Strengthen External Collaborations

Foster strategic partnerships with external organizations, including industry players, research institutions, and other government agencies, to leverage collective expertise and resources for mutual benefit. Collaborative projects and joint ventures can enhance innovation and expand the organization's reach.

4. Embrace Emerging Technologies

Emphasize the adoption of emerging technologies such as cloud computing, artificial intelligence, and Internet of Things (IoT) to enhance service delivery, efficiency, and competitiveness. Pilot projects and proofs of concept can be initiated to explore the feasibility and potential impact of these technologies.

5. Market Differentiation

Develop a clear value proposition and unique selling points to differentiate the organization from competitors in the ICT market. This can be achieved through specialization in niche areas, development of proprietary technologies, or offering bundled services that cater to specific customer needs.

6. Risk Management Strategies

Establish robust risk management frameworks and contingency plans to mitigate potential threats such as technological obsolescence, cybersecurity breaches, and market downturns. Regular risk assessments and scenario planning exercises can help identify vulnerabilities and proactively address them.

7. Streamline Operations

Continuously evaluate and optimize internal processes and workflows to improve efficiency and reduce operational costs. This can involve automation of repetitive tasks, adoption of lean management principles, and implementation of agile methodologies for project management.

8. Customer-Centric Approach

Place a strong emphasis on understanding customer needs and preferences, and tailor service offerings accordingly. Solicit feedback from clients and stakeholders through surveys, focus groups, and satisfaction assessments to identify areas for improvement and innovation.

By implementing these recommendations, the organization can overcome existing challenges, capitalize on emerging opportunities, and position itself for sustained success and growth in the dynamic field of information and communication technologies.

11) References & Sources