Network Infrastructure Maintenance and Troubleshooting at Paradise Technologies Limited.

by

Sakib Hassan Oyan
18101101

A reoprt submitted to the Department of Computer Science and Engineering
in partial fulfillment of the requirements for the degree of
B.Sc. in Computer Science

Department of Computer Science and Engineering
School of Data and Sciences
Brac University
September 2023

© 2023. Brac University
All rights reserved.

Declaration

It is hereby declared that

1. The report submitted is my own original work while completing degree at Brac University.
2. The report does not contain material previously published or written by a third party, except where this is appropriately cited through full and accurate referencing.
3. The report does not contain material which has been accepted, or submitted, for any other degree or diploma at a university or other institution.
4. I have acknowledged all main sources of help.

Student's Full Name & Signature:

Sakib Hassan Oyan
18101101

Approval

The report titled Network Infrastructure Maintenance and Troubleshooting at Paradise Technologies Limited" submitted by

1. Sakib Hassan Oyan (18101101)

Of Spring, 2018 has been accepted as satisfactory in partial fulfillment of the requirement for the degree of B.Sc. in Computer Science on September 21, 2023.

Examining Committee:

Supervisor:
(Member)

Md. Anwar Hossain
Head
Technical Division
Paradise Technologies Ltd.

Co-Supervisor:
(Member)

Md. Arif Shakil
Lecturer
Department of Computer Science and Engineering
Brac University

Program Coordinator:
(Member)

DR. Md. Golam Rabiul Alalm
Associate Professor
Department of Computer Science and Engineering
Brac University

Head of Department:
(Chair)

Sadia Hamid Kazi , PhD
Chairperson and Associate Professor
Department of Computer Science and Engineering
Brac University

Abstract

This internship report focuses on "Network Infrastructure Maintenance and Troubleshooting at Paradise Technologies Limited". The report delves into the critical aspects of maintaining and resolving issues in the company's network infrastructure. It explores the challenges faced, methodologies employed, and solutions implemented to ensure optimal performance and reliability. The findings and recommendations presented in this report aim to enhance the network's efficiency and overall customer experience.

Acknowledgement

I want to start by thanking Allah, the Almighty, for His mercy in allowing me to complete my internship report on time.
I want to express my gratitude to the Department of Computer Science and Engineering for maintaining internship credit in the graduating program's curriculum and giving me an opportunity to experience industry-oriented responsibilities and a line of work that attracts me. I also appreciate BracU's, Department of Computer Science and Engineering for providing an opportunity for me to choose my own internship in a company of my preference.
I would like to express my deep gratitude to Arif Shakil sir, who co-supervised my internship and encouraged me to share regular updates on my experiences there. He also instructed me throughout the semester so that I could navigate my internship in the right way. My internship's success may be directly linked to his insightful guidance and constant encouragement.
I also want to express my sincere gratitude to my organization's supervisor, Md. Anwar Hossain, Senior Network Engineer at Paradise Technologies Limited, for his kind encouragement, direction, helpful feedback, supervision, instructions, and advice. He inspired me to complete my internship at Paradise without incident. His efforts and contributions have been significant in improving my knowledge of the organization's operations and making my internship program successful.
I'm pleased that Sumon Sikder, an assistant network engineer at Paradise Technologies Limited, has always been my mentor and source of advice. Here, I improve my experience of the internship life with daily reporting and professional and mental assistance. My colleague and assistant network engineer, Afzalur Rahman, was a tremendous help to me when I was working on client-side and technical challenges. I also like to thank the whole employees of Paradise Technologies Limited for their help and advice throughout my internship.
I want to thank you all for being so kind and positive throughout my internship. You have had a significant impact on both my professional and personal development.

Table of Contents

Declaration i

Approval ii

Abstract iv

Acknowledgment v

Table of Contents vi

List of Figures vii

Nomenclature viii

1 Introduction 1
- 1.1 Rationale . . . 1
- 1.2 Background: . . . 1
- 1.3 Objectives: . . . 4

2 ACTIVITIES 5
- 2.1 Work-Related . . . 5
- 2.2 Organization-wide: . . . 11
- 2.3 Other relevant activities: . . . 11

3 CONSTRAINTS/CHALLENGES 14
- 3.1 Identified/Observed in the Organization: . . . 14
- 3.2 Academic Preparation: . . . 14
- 3.3 Personal/Professional Skills: . . . 15

4 ACQUIRED KNOWLEDGE 16
- 4.1 Consequences to Organization: . . . 16
- 4.2 Implications to University's Internship Program: . . . 16
- 4.3 Effects on Personal/Professional Skills: . . . 17

5 CONCLUDING STATEMENTS 19
- 5.1 Summary: . . . 19
- 5.2 Recommendations/Suggestions for Future Strategies Actions: . . . 19

Bibliography 22

List of Figures

2.1 The Dude App for network interface & client status monitoring. . . . 6
2.2 Client's Complain Management Data sheet. 6
2.3 Client's ONU status checking from the OLT. 7
2.4 Switch status checking 7
2.5 Client's bandwidth traffic monitoring from Microtik WinBox. 8
2.6 All Switch status report 8
2.7 All OLT client down status report 9
2.8 All OLT interface status report 9
2.9 Sending email to the client in case of emergency situations. 10
2.10 Bandwidth weather map monitoring from Cacti app. 12
2.11 Bandwidth uses monitoring from Microtik router interface. 12

Nomenclature

The next list describes several symbols & abbreviation that will be later used within the body of the document

$CCNA$ Cisco Certified Network Associate

NOC Network Operation Center

OLT Optical Line Terminal

ONU Optical Network Unit

OSI Open Systems Interconnection

PCI Paradise Cables Limited

PGI Paradise Group of Industries

TCP Transmission Control Protocol

$VLAN$ virtual local area network

Chapter 1

Introduction

1.1 Rationale

The purpose of this internship report is to document my internship experience at Paradise Technologies Limited. The primary objective of my internship was to gather practical knowledge and experience in the field of network infrastructure. The significance of this report lies in its capacity to evaluate the achievements of my internship program and to offer an in-depth evaluation of the abilities and information I have acquired throughout my internship. This report details the primary challenges I experienced throughout my internship and the techniques I used to get beyond them. It also offers an in-depth review of the many networks infrastructure maintenance and troubleshooting methods I learned and used during my internship. For other students and professionals with an interest in network operations, the report is a great resource. It outlines the key difficulties experienced throughout the internship and the approaches used to deal with them. The results of this study may be utilized to direct future interns and give them insight into the industry's maintenance and troubleshooting methods for network infrastructure. The report also provides a way to assess the efficacy of the internship program at Paradise Technologies Limited. It offers an evaluation of the information and practical skills acquired during the internship and how they connect to the aims and objectives of the company. In conclusion, this report is essential for documenting the outcomes of the internship program, showing the relevant abilities, and offering valuable guidance for prospective network operations professionals and interns.

1.2 Background:

The Bangladeshi multi-industry company Paradise Group of Industries (PGI) consists of a number of independent and unconnected business entities that operate in multiple industries as a single corporate group. In 1983, Mosharraf Hossain established this company. This conglomerate's sectors include light engineering, electrical cable, textiles, real estate, etc. Paradise Cable Limited (PCL), SBS Cables Ltd., and Paradise Spinning Mills Ltd. are its three principal corporate divisions. The top producer of all different kinds of wires, cables, and conductors in Bangladesh is Paradise Cables. The group started off it's journey in the textile and trade industries before expanding into the manufacture of wire and cables. With the objective

of offering premium internet service at an affordable price, Paradise Technologies Limited started operations in 2016.[1]

A list of the companies under Paradise Group of Industries are given below:

1. Paradise Cables Limited
2. SBS Cables Limited
3. Paradise Spinning Mills Limited
4. Paradise Fashions (Pvt) Limited
5. Paradise Merchandising Limited
6. Paradise Marketing Limited
7. Saleha Wire Limited
8. Paradise Metallurgical Complex Limited
9. Paradise Properties Limited
10. Paradise Electric and Electronics Limited
11. Paradise Telecom Limited
12. Paradise Technologies Limited

Mission:
The goal of Paradise Technologies Limited is to offer its clients high-quality, dependable, and affordable internet services while preserving the highest levels of customer service. To maintain its competitive advantage in the market, the company tries to do this by making improvements to its network infrastructure and human resources. The business is dedicated to utilizing modern technologies in order to give its clients optimal up time and the lowest downtime. Paradise Technologies Limited is committed to offering top-notch 24x7 customer service, developing long-lasting relationships with its clients, and keeping the interests and demands of its customers at the core of its operations. To guarantee the provision of high-quality services to its clients, the company also practices openness, truthfulness, and ethical standards in every business relationship. Additionally, it promotes a culture of teamwork and collaboration.[2]

Vision:

Paradise Technologies Limited's vision is to become the premium internet service provider in the area by offering reliable and advanced internet solutions that can adapt to the changing requirements of its clients. In order to keep its competitive advantage in the marketplace, the company is dedicated to realizing this aim by making improvements in its network infrastructure and human resources. The company wants to stay on top of new technological developments and provide its clients with the most advanced and affordable internet services. In addition, Paradise Technologies Limited works to foster a culture of teamwork and collaboration among the staff members, ensuring they are properly trained and equipped to provide top-notch customer support. By offering exceptional internet services and support, as well as being attentive to their wants and concerns, the company hopes to build lasting relationships with its clients.[2]

1.3 Objectives:

The main objective of this internship is to demonstrate to a company how I express myself as well as how I handle clients with different requirements while presenting my work skills and expertise. A vital part of the internship is this report.
The objective of this report is to:

1. To provide an overall summary of Paradise Technologies Limited's network operation center (NOC) and explain how it operates while maintaining an eye on the network infrastructure of the company.

2. To explain the equipment and methods the NOC team uses to keep an eye on and fix the network infrastructure.

3. To demonstrate and put into practice the knowledge and skills gained throughout the internship.

4. To identify any areas of the network infrastructure that are having issues with performance or other issues and to suggest solutions.

5. To examine network traffic data that the network operation center has gathered to discover patterns, trends, and potential security risks.

6. To consider my personal development and experiences gained during my internship at Paradise Technologies Limited and to connect those to the report's objectives and results.

By fulfilling these objectives, the report aims to provide an in-depth review of the network operations and infrastructure of Paradise Technologies Limited as well as suggestions for enhancing its efficiency and performance. This report will also serve as a record of my accomplishments and contributions to the company, as well as show how the information and skills I learned during the internship were applied in real-life situations.

Chapter 2

ACTIVITIES

2.1 Work-Related

Work Load: I worked in the network operation center (NOC) department of Paradise Technologies Limited during my internship and was in charge of the following duties:

1. Monitoring the company's network infrastructure to make sure it is operating properly and fixing any issues that may arise.
2. Checking daily complains from the clients.
3. Checking client's database:
4. Client details full information.
5. Current client connection & disconnection list.
6. Client's devices and diagram information.
7. Checking POP-wise devices information.
8. Checking all switches, OLTs, routers and giving a report to the seniors.
9. Receiving phone calls from the clients and taking notes if there are any complaints from the clients.
10. Sending emails to the relevant departments as soon as possible if anything happens, like a fiber cut.
11. Giving physical support to the client if necessary.

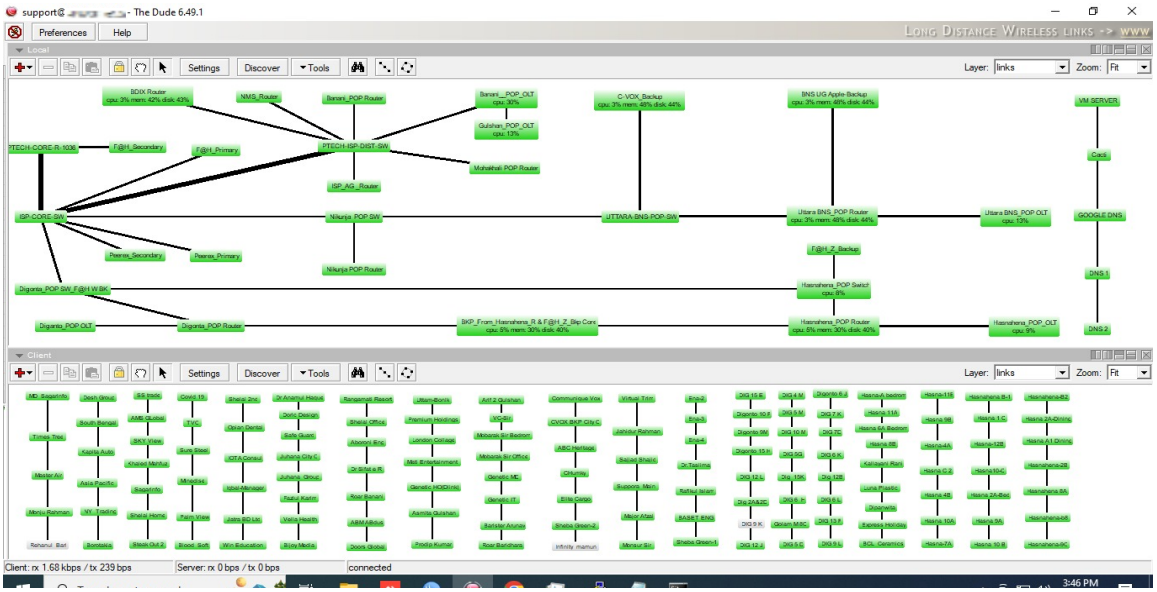


Figure 2.1: The Dude App for network interface & client status monitoring.

Paradise Technologies Limited
Client & Link Complain Management

S	C. Cd	Client Name/L	Location/Addr	Number	Complain	Issue/Problems	omplain Date &	Solve Remarks	Solve Date & Ti	Assinged Te	Status	Done By
11	BB068	Naher	Banani		Biplop mkt	problem increases a lot after	##########	Informed client about	##########	NOC	Solved	Oyan
12	DH001	Hashena 9C	Dhanmondi		Client	Not getting internet	##########	clients router was off,	##########	NOC	Solved	Oyan
15	UB021	Ena 4	Uttara		Client	NO internet issue	##########	ONU was off, solved	##########	NOC	Solved	Oyan
21	GG014	Photocopy Corne	Gulshan		Client	Connector broken	##########	through phone call	##########	NOC	Solved	Oyan
24	GG015	Quick Travels	Gulshan		Client	Connector change	##########	2 new connector given	##########	NOC	Solved	Oyan
34	KB009	Fuji Lab 2	Kakoli		Client	support needed	##########	New 1.5M lan cable given	##########	NOC	Solved	Oyan
36	BB032	Juhana Group	Banani		Client	frequently, couldn't give	##########	Now okay	##########	NOC	Solved	Oyan
37	FC005	MD Sir Basha	Gulshan		nayed Accour	sometimes	##########	ONU, mikrotic and deco	##########	NOC	Solved	Oyan
38	KB009	Fuji Lab 2	Kakoli		Biplop mkt	Gmail not working	##########	all rebooted and	##########	NOC	Solved	Oyan
39	KB009	Fujilab-2	Kakoli		client	pc no internet	##########	DNS was missing	##########	NOC	Solved	Oyan
41	DH004	10A	Hashena		client	Slow net issue	##########	xed IP and DNS set on P	##########	NOC	Solved	Oyan
52	PD011	Digonto 13F	Digonto		Asad billing	internet	##########	Physical support given	##########	NOC	Solved	Oyan
59	UB018	Ena counter 1	Uttara		Asad billing	Slow net issue	##########	router to ONU cable	##########	NOC	Solved	Oyan

Paradise Technologies Limited

1		F@H 2nd / Via R-11	Star Kabab		Ourselves	Fiber Cut	3/16/2023 14:10:23	Star Kabab Fiber Cut	3/16/2023 14:13:25	TX Team	Solved	Oyan
3	BB064	Imran Manager	Banani		Imran	New Link Up	3/16/2023 14:57:37	PPPOe User	3/16/2023 16:27:30	NOC	Solved	Oyan
5		TV Server	Uttara BNS		Mosiur Vhai	Down/SFP Change	3/17/2023 19:46:52	Okay	3/19/2023 16:15:12	Core	Solved	Oyan
7	UB014	Dr. Taslima	Uttara		Dr.Taslima	Requsted to 1K	3/17/2023 19:46:52	Remotely	3/17/2023 15:55:20	NOC	Solved	Oyan
8	DH004	Mr. Sadiq Ibne Rouf	Hasnahena-10A		Madam	Net Slow Issue	3/17/2023 19:46:52	Remotely	3/17/2023 19:46:52	NOC	Solved	Oyan
10	UB014	Dr. Taslima	Uttara		Dr.Taslima	Requsted to 15M	3/17/2023 21:17:43	Remotely	3/17/2023 21:18:20	NOC	Solved	Oyan
15	BB034	Vella Healthcare	Banani		Reciption	No Internet	3/18/2023 11:35:10	Remotely Firmware Updated	3/18/2023 12:08:08	NOC	Solved	Oyan
16	DH025	Iqbal Hossain	Dhanmondi 10B		Iqbal Hossain	t on Monday, 20 March)>>today 2	3/18/2023 12:44:32	ONU Changed	3/22/2023 12:31:12	NOC	Solved	Oyan
21	PD002	Razia Siddika	Digonto 6K		Fariha	No Internet	3/19/2023 10:10:17	Remotely	3/19/2023 10:11:30	NOC	Solved	Oyan
23	BB063	Swapnil Asst.	Banani		Tanvir	Email Address Change Issue	3/19/2023 11:12:35	Changed now	3/19/2023 16:16:16	NOC	Solved	Oyan
33	KB006	Star Gold	Banani		Atiq	New Link Up	3/21/2023 10:56:29	Okay	3/22/2023 15:59:57	TX Team	Solved	Oyan
34	BB061	Juhana Group 2	Banani		Manager	Net Slow too much	3/21/2023 11:31:35	Remotely DECO rebooted	3/21/2023 11:41:58	NOC	Solved	Oyan
37	KB006	Star gold	kakoli		Atiq	net problem (maja maja net sara dai)	3/21/2023 19:27:23	Ping monitored and no issue found	3/22/2023 15:45:31	NOC	Solved	Oyan
39	BB065	Md.Riyad	Banai		Md.Riyad	New Link Up	3/22/2023 12:30:21	Okay	3/22/2023 12:45:28	TX Team	Solved	Oyan
40	BB007	South Bangla	Banani		Reciption	Phone Connect Problem	3/22/2023 12:43:56	LAN Loose Connection	3/22/2023 13:23:20	NOC	Solved	Oyan
41	BB037	Iota Consult	Banani		Manager	Net Slow	3/22/2023 15:47:15	port and suggested them to change	3/22/2023 15:50:52	NOC	Solved	Oyan
42	UB020	Ena-3	Uttara		Afzal	Net slow	3/22/2023 18:08:58	Router Re-Configured	3/22/2023 19:06:52	NOC	Solved	Oyan
43	BB009	Nodi Ltd.	Banani		Manager	e they take off their cableNeed phy	3/22/2023 19:44:33	LAN Connection Solved	3/23/2023 12:31:44	NOC	Solved	Oyan
45	UB020	Ena-3	Uttara			Need Physical Support with LAN Cable	3/23/2023 12:31:44	Given Physical Support	3/23/2023 16:38:31	NOC	Solved	Oyan
50	GG015	Quick travel	gulshan-2		sakib hassan	Buffer while browsing	3/23/2023 12:57:29	Remotly solved	3/23/2023 16:07:24	NOC	Solved	Oyan
51	KB007	SMA Overseas Ltd 1	Kakoli		Md.Sohel	New Link Up	3/23/2023 16:07:24	Complete	3/23/2023 16:07:24	TX Team	Solved	Oyan
64	UB007	Elite Cargo Ltd	Uttara		Manager	Specific shipping site not working	3/27/2023 16:04:20	Solved	3/27/2023 16:04:20	NOC	Solved	Oyan

Figure 2.2: Client's Complain Management Data sheet.

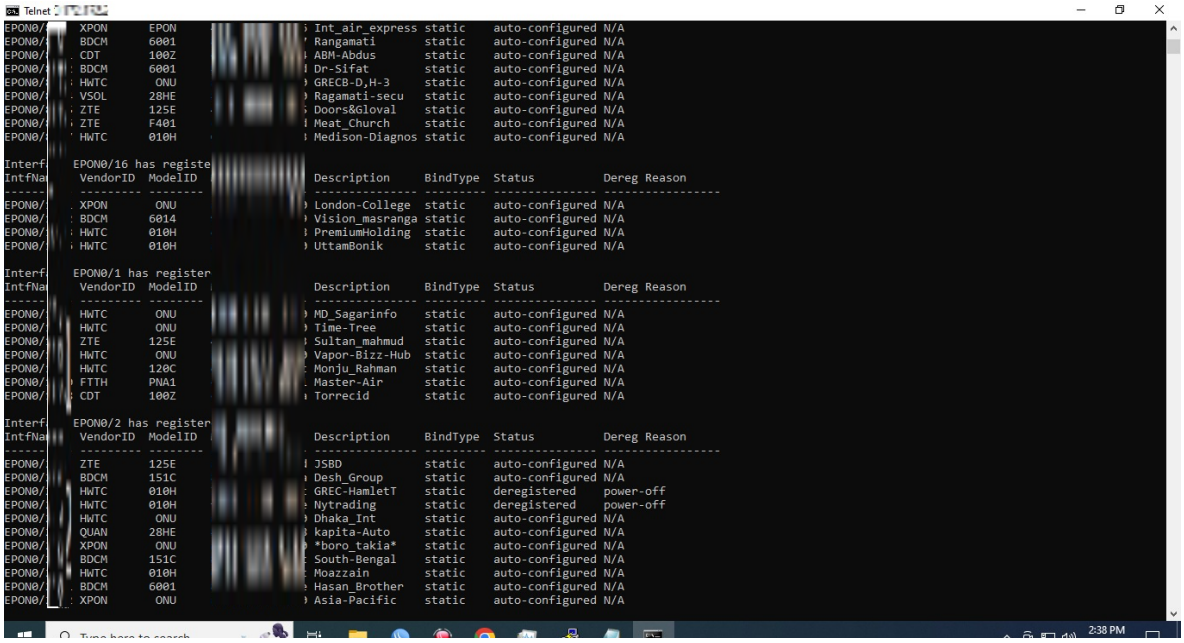


Figure 2.3: Client's ONU status checking from the OLT.

Figure 2.4: Switch status checking

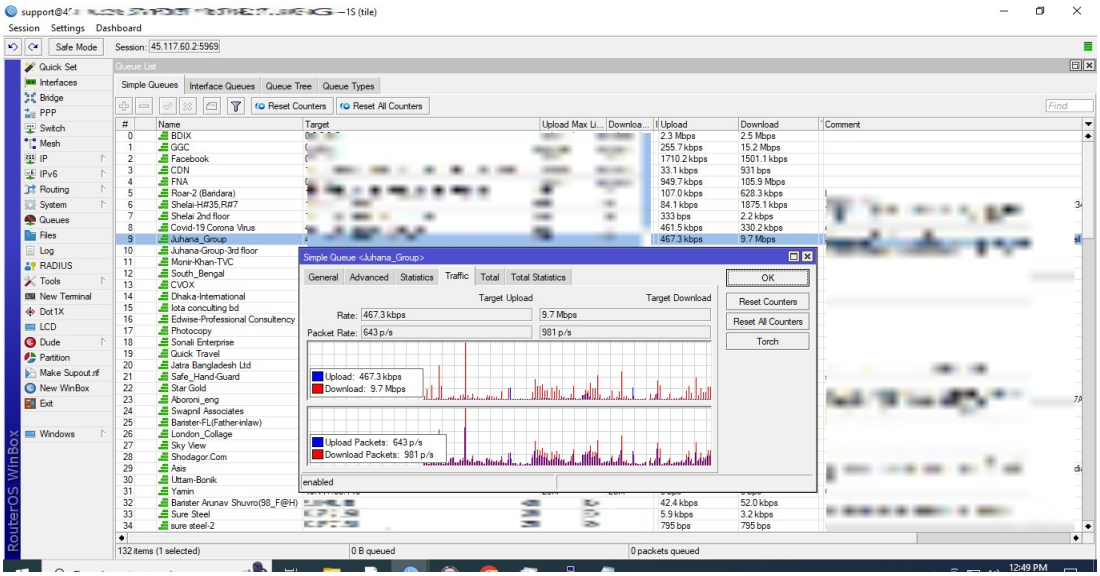
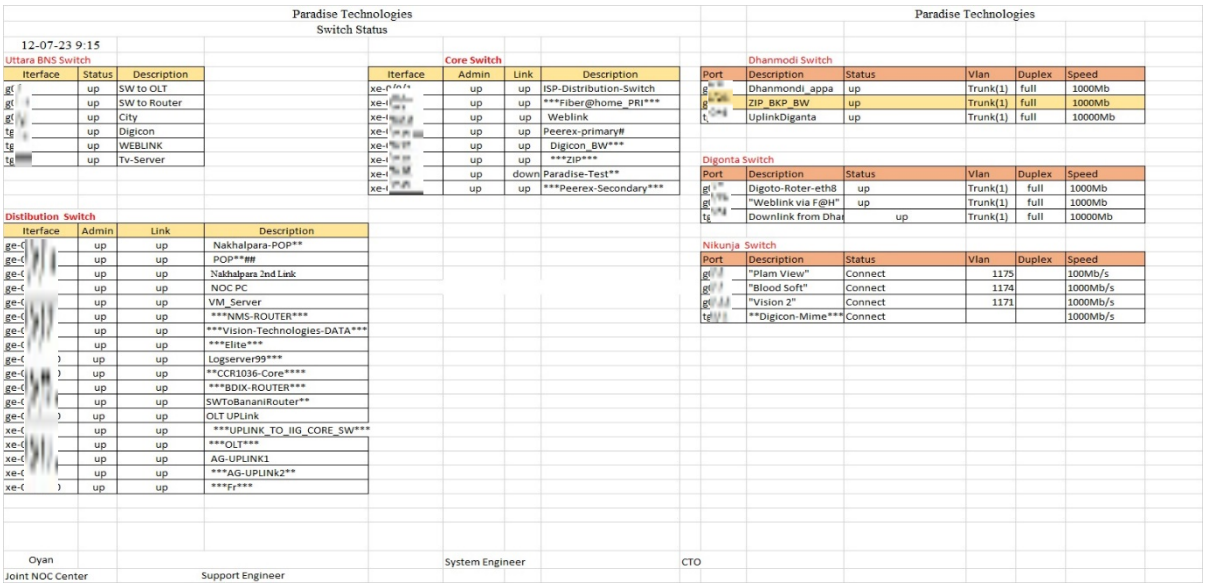


Figure 2.5: Client's bandwidth traffic monitoring from Microtik WinBox.



Paradise Technologies
Switch Status

12-07-23 9:15

Uttara BNS Switch

Iterface	Status	Description
gi	up	SW to OLT
gi	up	SW to Router
gi	up	City
te	up	Digicon
te	up	WEBLINK
te	up	Tv-Server

Core Switch

Iterface	Admin	Link	Description
xe-0/0/1	up	up	ISP-Distribution-Switch
xe-0/0/2	up	up	***Fiber@home_PRI***
xe-0/0/3	up	up	Weblink
xe-0/0/4	up	up	Peerex-primary#
xe-0/0/5	up	up	Digicon_BW***
xe-0/0/6	up	up	***ZIP***
xe-0/0/7	up	down	Paradise-Test**
xe-0/0/8	up	up	***Peerex-Secondary***

Distibution Switch

Iterface	Admin	Link	Description
ge-0/0/0	up	up	Nakhalpara-POP**
ge-0/0/1	up	up	POP**##
ge-0/0/2	up	up	Nakhalpara 2nd Link
ge-0/0/3	up	up	NOC PC
ge-0/0/4	up	up	VM_Server
ge-0/0/5	up	up	***NMS-ROUTER***
ge-0/0/6	up	up	***Vision-Technologies-DATA***
ge-0/0/7	up	up	***Elite***
ge-0/0/8	up	up	Logserver99***
ge-0/0/9	up	up	**CCR1036-Core****
ge-0/0/10	up	up	***BDIX-ROUTER***
ge-0/0/11	up	up	SWToBananiRouter**
ge-0/0/12	up	up	OLT UPLink
xe-0/1/0	up	up	***UPLINK_TO_IIG_CORE_SW***
xe-0/1/1	up	up	***OLT***
xe-0/1/2	up	up	AG-UPLINK1
xe-0/1/3	up	up	***AG-UPLINk2**
xe-0/1/4	up	up	***Fr***

Oyan
Joint NOC Center
Support Engineer
System Engineer
CTO

Paradise Technologies

Dhanmodi Switch

Port	Description	Status	Vlan	Duplex	Speed
ge	Dhanmondi_appa	up	Trunk(1)	full	1000Mb
ge	ZIP_BKP_BW	up	Trunk(1)	full	1000Mb
te	UplinkDiganta	up	Trunk(1)	full	10000Mb

Digonta Switch

Port	Description	Status	Vlan	Duplex	Speed
gi	Digoto-Roter-eth8	up	Trunk(1)	full	1000Mb
gi	"Weblink via F@H"	up	Trunk(1)	full	1000Mb
te	Downlink from Dha	up	Trunk(1)	full	10000Mb

Nikunja Switch

Port	Description	Status	Vlan	Duplex	Speed
gi	"Plam View"	Connect	1175		100Mb/s
gi	"Blood Soft"	Connect	1174		1000Mb/s
gi	"Vision 2"	Connect	1171		1000Mb/s
te	**Digicon-Mime***	Connect			1000Mb/s

Figure 2.6: All Switch status report

Daily Client Down Status											
12-07-23 9:15											
Banani			Digonta			BNS			Hasnahena		
Interface	Name	Status	Interface	Name	Status	Interface	Name	Status	Interface	Name	Status
EPON[illegible]	Fazle-Jubolig	power-off	EPON[illegible]	Office_Gulam	Offline	EPON[illegible]	dr-taslima	power	EPON[illegible]	N/A	unknow
EPON[illegible]	Rajdhani_Decor1	power-off	EPON[illegible]	Shaiful_Associate	Offline	EPON[illegible]	Scientific	power	EPON[illegible]	N/A	unknow
EPON[illegible]	Asis***	power-off	EPON[illegible]	N/A	Offline	0	0	0	EPON0[illegible]	N/A	unknow
EPON0[illegible]	ABM-Abdus	power-off				0	0	0	0	0	0
EPON0[illegible]	Doors&Gloval	power-off	0	0	0				0	0	0
EPON[illegible]	N/A	wire-down	0	0	0	Gulshan			0	0	0
EPON[illegible]	GREC-HamletT	power-off	0	0	0	Interface	Name	Status	0	0	0
EPON[illegible]	chomon	power-off	0	0	0	EPON[illegible]	Yamin	power	0	0	0
0	0	0	0	0	0	EPON[illegible]	Vision_Gulshan	power	0	0	0
0	0	0				EPON[illegible]	Antoch_Badda	power	0	0	0
0	0	0				0	0	0	0	0	0
0	0	0				0	0	0	0	0	0
0	0	0				0	0	0	0	0	0
0	0	0				0	0	0			
0	0	0				0	0	0			
0	0	0				0	0	0			
0	0	0				0	0	0			
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
0	0	0									
Oyan											
Joint NOC Center		Support Engineer			System Engineer			CTO			

Figure 2.7: All OLT client down status report

Daily OLT Interface Status											
12-07-23 9:15											
Banani			Gulshan			BNS			Hasnahena		
Interface	Port Description	Conn. Status	Interface	Port Description	Conn. Status	Interface	Port Description	Conn. Status	Interface	Port Description	Conn. Status
g[illegible]	GUL-2-Via-62***	Connect	G[illegible]	Primary_R:11	Connect	G[illegible]	BNS-Switch-ge-0/0/4	Connect	g[illegible]	mikrotik_T_Etherport_4	Connect
g[illegible]	Gul-2 Via 11**	Connect	G[illegible]	Secondary_R:62 Via Gul 2	Connect	G[illegible]	Connected-To-BNS-Mkt-Ether5	Connect	epc[illegible]	0	Connect
tg[illegible]	OLTtoSWport33	Connect	F[illegible]	TO-BANANI	Connect				epc[illegible]	Hasnahena 2C	Connect
[illegible]	To-Gulshan	Connect							epc[illegible]	Tanbir_misuk_dainingRoom_A1	Connect
Oyan											
Joint NOC Center		Support Engineer			System Engineer			CTO			

Figure 2.8: All OLT interface status report

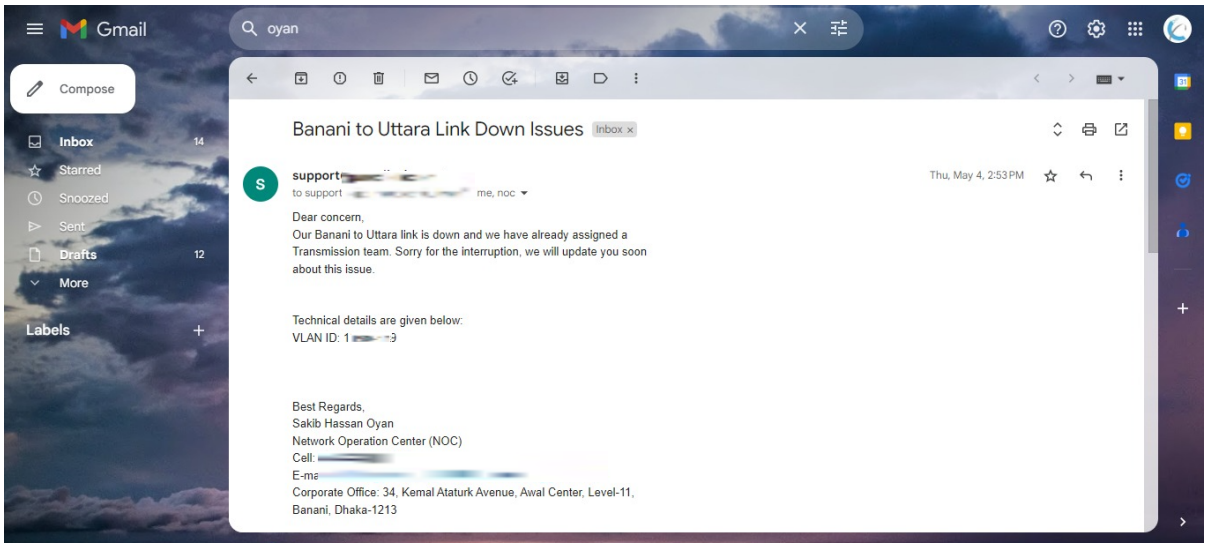


Figure 2.9: Sending email to the client in case of emergency situations.

Time Maintenance:

During my internship period at Paradise Technologies Limited, I was responsible for maintaining a daily work schedule and finishing my tasks in a timely and efficient manner. To ensure that I was able to meet my commitments, I employed the following strategies:

1. I would set definite objectives and priorities for myself at the start of each day and week, depending on the work that needed to be done and upcoming deadlines. I was able to stay organized and focused due to this during my internship.

2. I arranged my duties according to urgency and priority, making sure to do the most important ones first. This assisted me in efficiently managing my workload and preventing overwhelm.

3. I discussed issues regularly with my supervisors and colleagues to make sure I was fulfilling their expectations and finishing issues on time. This gave me the chance to get feedback and suggestions for my work.

Overall, I discovered that following a regular work schedule and making effective use of time management techniques were crucial to finishing my work during my internship at Paradise Technologies Limited.

Travel:

I always took care to plan my route in advance whenever I knew I needed to go somewhere else. This required researching the route, analyzing the traffic, and calculating the journey time. I frequently took public transit to get to other places because my office was close to a significant transportation hub. I was able to cut down on travel expenses and save time as a result. I took care to stay in touch with my supervisors and fellow employees while I was away from the office so that I could keep them informed of my progress and any problems that came up.

2.2 Organization-wide:

As a trainee network engineering intern at Paradise Technologies Limited, I worked at the Network Operation Center (NOC), which was in charge of keeping an eye on and maintaining the network infrastructure for the company. The smooth operation of the company's IT systems and services were greatly assisted by our NOC department. The NOC department's workload and actions had a major effect on the company as a whole. Our division was in charge of making sure the company's network was constantly accessible to support crucial company procedures. We had to work hard to ensure high network availability since any outages or disruptions may cause the company to suffer significant losses. We kept monitoring network performance and identified places that might require improvement. We were able to increase the efficiency and dependability of the company's IT systems and services by improving network performance. Our NOC department supported other administrative sections, including the IT help desk and customer service teams. In order to address network-related issues and make sure that these departments had the resources they needed to efficiently serve clients, we closely collaborated with them.

2.3 Other relevant activities:

I had a lot of work to do at Paradise Technologies Limited, but I also participated in a lot of activities outside of work. The activities were designed to provide me with a well-rounded educational experience and support me in developing the skills required for success in the profession. Other relevant tasks I did throughout my internship include the following:

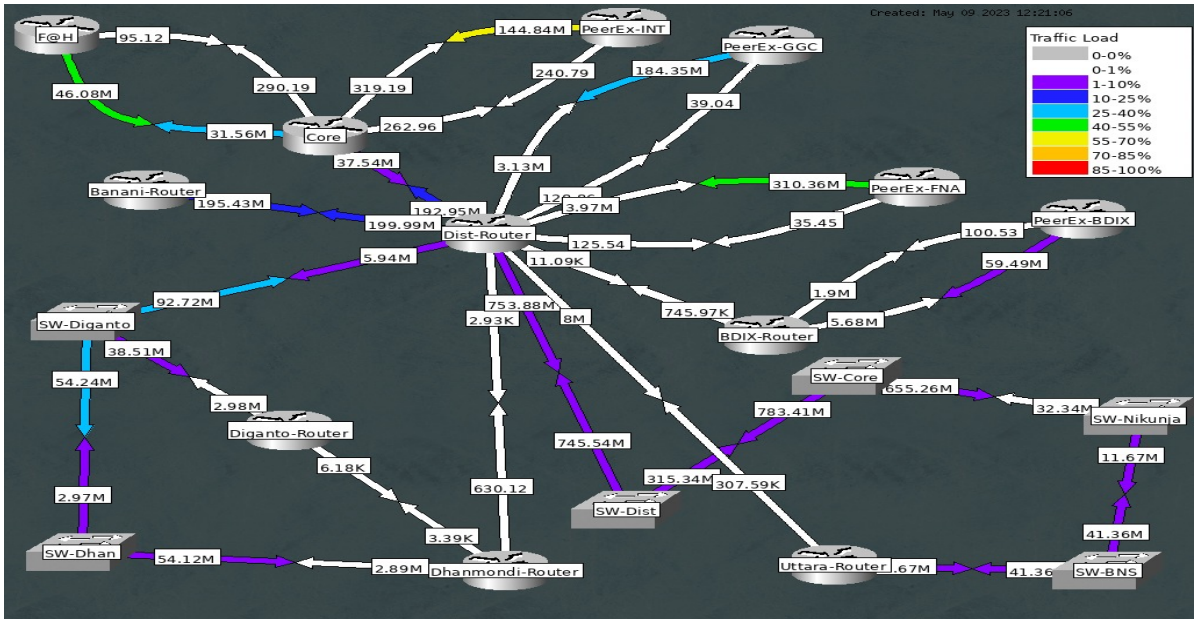


Figure 2.10: Bandwidth weather map monitoring from Cacti app.

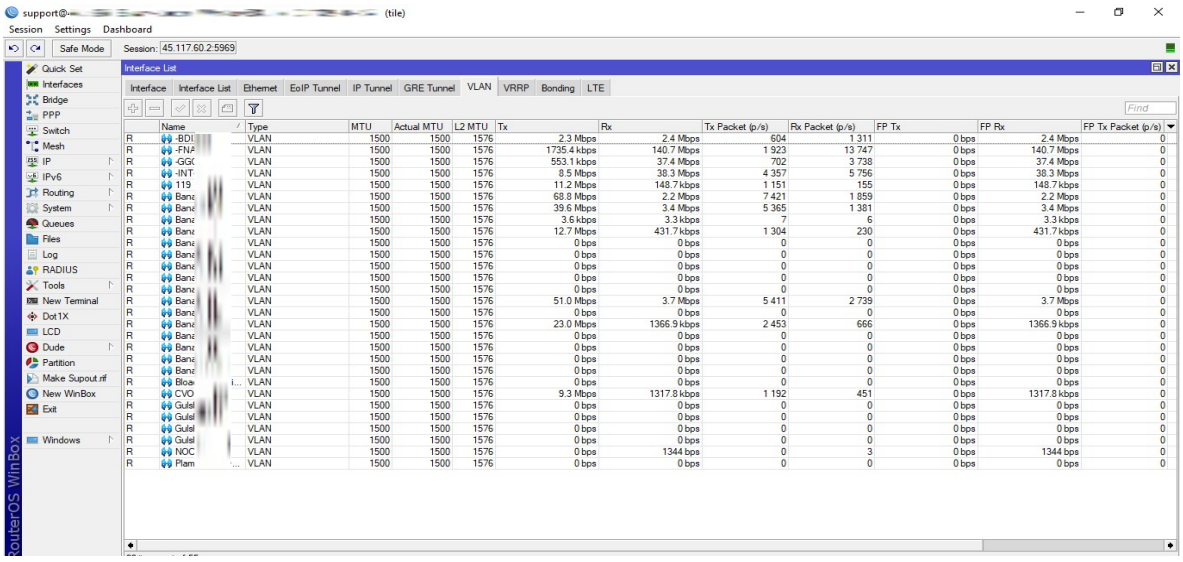


Figure 2.11: Bandwidth uses monitoring from Microtik router interface.

Communications:

As part of my internship, I had the opportunity to interact with a range of company stakeholders, including senior engineers, team leaders, and other interns. This helped me improve my communication abilities and understand the value of straightforward communication in the workplace.

Support:

When necessary, I provided assistance to other teams within the company. For example, I gave colleagues in other departments technical support and assisted the IT help desk team in troubleshooting network-related difficulties. Sometimes I gave physical support to the client to fix their internet problems or configure their routers.

Contacts:

I also had the opportunity to network with other professionals in my field while I was doing my internship. I was able to develop my professional network and explore new career opportunities as an outcome of this. I had contacted my seniors regularly so that I could get their experience in this networking field to build up my career in the right way.

Customer care:

I also had the opportunity to interact with Paradise Technologies Limited's clients. In addition to assisting clients who were having issues with their internet services, I worked with the customer care team to find solutions for network-related problems. Sometimes clients complained about the slow internet issue or not getting internet at all. Then I took the complaints of the clients in our complaint management data sheet and tried to find out the reason for the issues. Sometimes I could solve the issues remotely by checking the client's ONU and router status from the system. After rebooting the client's devices, I again contacted the client to confirm whether the issues had been resolved or not. If not, then I informed my seniors about the issue, and they suggested solutions. In case of any fiber cut issues, I informed the transmission team of our company, and they solved those issues as soon as possible. Overall, these extra-relevant experiences gave me a well-rounded learning experience and supported me in developing the skills required for success in the profession. I am thankful for the experiences I had throughout my internship and the support that I got from colleagues at Paradise Technologies Limited.

Chapter 3

CONSTRAINTS/CHALLENGES

3.1 Identified/Observed in the Organization:

At Paradise Technologies Limited, the work environment was not always one that encouraged productivity. Sometimes the workplace was too packed, which made it hard for me to concentrate and work well. This sometimes prevented me from properly contacting the clients. Additionally, there were not enough other tools to practice with. I had to work under pressure since I had to contact with the clients and address their problems when the other engineers were on vacation. I had to handle the clients in order to allow us time to address any inadvertent fiber cut issues as quickly as feasible. Although Paradise Technologies Limited provided certain training sessions for freshmen workers and interns, I found that they were frequently insufficiently thorough to cover all the skills and information required to carry out their duties successfully. Additionally, there were few opportunities for continuing education and training, which might have an effect on staff retention and career development. Another difficulty I saw at Paradise Technologies Limited was communication. In certain cases, there was a breakdown in communication between the various departments and the staff, which resulted in misunderstandings and ineffective execution of tasks.

3.2 Academic Preparation:

My academic background in the CSE department provided me with a solid foundation in computer science and networking fundamentals. This includes an understanding of networking ideas such as the OSI model, the TCP/IP protocol suite, routing and switching, VLAN, network security, and networking design concepts. My studies, however, had certain drawbacks because I lacked practical experience with actual networking hardware and software. This gap was discovered during my internship, when I experienced real-world problems that required me to be familiar with particular hardware and software tools. Despite these difficulties, I realized that my CSE program's skills and knowledge helped me comprehend some ideas and complete some activities. For instance, I was able to setup devices and troubleshoot routers according to my fundamental networking protocol and configuration knowledge. Despite this discrepancy, my academic background turned out to be highly

relevant to my current job and the prerequisites for any future jobs at Paradise Technologies Limited. In order to fully understand the network infrastructure of the company, diagnose network difficulties, and build solutions to enhance network performance and security, I was able to put my theoretical knowledge to use. In addition, my academic background gave me a solid basis for professional growth because it allowed me to build on my prior knowledge and abilities to pick up new capabilities in networking and related fields of technology.

3.3 Personal/Professional Skills:

The most important skill needed for a position in a network operation center is technical expertise. Technical skills such as networking protocols, routing, switching, and other network technologies have been listed as necessary qualifications for the position. If my technical skills are lacking or insufficient, I had enrolled myself into a CCNA training center and continuing my courses there to sit for the CCNA 200-301 exam to advance my knowledge and abilities. Everyone who works in a network operation center has to be an excellent communicator in order to communicate with clients, vendors, and other team members. If someone does not have these abilities, he may need to focus more on his communication skills. It could be necessary to meet tight deadlines and respond quickly in an emergency at a NOC. Time management capabilities are therefore essential to the success of any profession. It needs to practice planning and prioritizing things if time management abilities are lacking in order to finish them effectively. Everyone will frequently run into complicated issues in a NOC that require original solutions. Problem-solving abilities must be recognized as vital for the position. In the absence of these abilities, it needs to be focused on improving analytical and critical thinking abilities. Working with other team members is certainly required to achieve common goals. Everyone, therefore, needs to be able to work together in an effective collaborative environment. If these abilities are lacking, it is necessary to concentrate on developing relationships with colleagues and improving one's communication and interpersonal abilities.

Chapter 4

ACQUIRED KNOWLEDGE

I learned a lot about network operations and maintenance during my internship at Paradise Technologies Limited and gained lots of practical knowledge. My understanding of the subject improved significantly since I was able to relate the theoretical ideas, I gained in my computer science and engineering classes to real-life scenarios. I acquired knowledge in the following areas: network infrastructure, network security, network monitoring tools, etc.

4.1 Consequences to Organization:

The knowledge and skills I acquired during my internship might help the company. I am able to support customers and increase the performance of the network operation center if I have greater knowledge of solving problems with the network infrastructure. My experience in network monitoring and upkeep may also assist in reducing downtime and enhancing network performance. I can contribute to the achievements and development of the company by making use of the skills and knowledge I have acquired throughout my internship. In terms of learning and experience, I can honestly say that I had a great time throughout my internship. I was confident that this internship program would improve my understanding of the job sector and my possible career right away. I have a fantastic opportunity to get to know myself in a practical, realistic interaction environment. Throughout my internship, I have made it a point to study the art of learning and to transmit the knowledge I have acquired. I knew that this internship would provide me with an opportunity to reorganize my skills and boundary of knowledge.

4.2 Implications to University's Internship Program:

I have got the most amazing chance to gain practical, real-world experience by this internship opportunity. I am grateful to the Department of Computer Science and Engineering for permitting me to continue my internship credit. It helps me to feel the flavor of corporate and industry-oriented activities as well as my field of work. It was the kind of experience that was absolutely required for my career goals. I would like to thank the entire Department of Computer Science and Engineering. The knowledge gained throughout the internship program emphasizes how crucial

it is to give students actual work experience in addition to their academic education. This may be done through connections to recognized organizations that can provide opportunities for hands-on learning. It also emphasizes how important it is for students to develop soft skills, which are necessary for success in the workplace and include excellent communication, problem-solving, and time management. The institutions should thus incorporate training sessions for these abilities into the internship program. The data collected may be used to assess how well the university's course offerings prepare students for employment. The obtained information may be used to assess how well the educational institution's courses prepares students for job opportunities. This will provide the institution the chance to identify problem areas and make the necessary improvements to guarantee that graduates have the abilities and information needed by the industry at large.

4.3 Effects on Personal/Professional Skills:

During my internship, I was able to enhance and develop multiple personal and professional capacities. Firstly, I developed my technical skills, specifically in the area of networking and troubleshooting. I learned how to manage and configure different network devices and acquired hands-on expertise in diagnosing network issues. As I had to connect with colleagues and customers in order to comprehend their needs and offer answers, I also enhanced my written and vocal communication abilities. In addition, I developed essential teamwork, time management, and problem-solving skills. To fulfill my responsibilities and solve problems in the allocated time, I communicated with my teammates. I also learned how to prioritize work and manage my time properly to meet deadlines. Overall, the internship gave me a fantastic chance to develop my professional and personal talents, which will help my future professional growth and development. I am briefly explaining some points:

Improve communication skills:

I improved my communication skills by working in a professional environment and interacting with colleagues, clients, and vendors. I acquired expertise on how to speak with authority and clarity, how to listen attentively, and how to professionally engage with people.

Increased technical skills:

I was introduced to new technologies and techniques during my internship that I had never utilized before. I honed my skills in a variety of networking hardware and software programs through training sessions and hands-on experience. In addition to assisting me in my present position, this has improved my marketability for any future job opportunities.

Enhanced problem-solving abilities:

My ability to think critically and creatively was put to the test as I came up with solutions to network problems. I developed the ability to examine complicated issues, breakdown them into smaller parts, and determine their root causes. I've benefited from having this expertise in both my personal and professional lives.

Improved time management:

One of the most important aspects of my internship was managing many tasks and meeting deadlines. I gained valuable expertise in managing time, task prioritization, and productivity under pressure.

Increased Confidence:

My confidence was boosted by finishing challenging tasks successfully and receiving appreciation from my supervisor and colleagues. Now that I have more confidence in my skills, I feel more prepared to take on new tasks and responsibilities.

Strengthened team work skills:

I learned the value of collaboration and how to effectively collaborate with others by working on multiple tasks with my teammates. I realized how to cooperate with others who have different personalities and working methods and offer my special talents and qualities to the achievement of a common target.

Chapter 5

CONCLUDING STATEMENTS

5.1 Summary:

The internship report includes many different topics, including the background, objectives, and work-related activities of the company, as well as personal and professional skills, issues and difficulties faced, academic preparation, new information learned, and implications for the university's internship program. The company's efficiency and competitiveness are impacted by the knowledge acquired in network administration, system maintenance, and customer service. This report demonstrates the knowledge I gained and the experiences I encountered while interning at Paradise Technologies Limited. I was given a position in the network operations center, where I learned how to monitor, maintain, and troubleshoot networks directly. The report goes through the goals, plans, and tasks for my internship as well as the difficulties I ran into while working on them. The importance of time management, clear communication, and teamwork in achieving company goals is emphasized in the report. I was able to learn new information and skills about network administration and troubleshooting during my internship. The report also discusses how my efforts have impacted the company and the internship program at the university. The report also identifies areas where the university's internship program can be improved, such as by better integrating academic preparation with professional standards. Overall, my internship at Paradise Technologies Limited gave me useful real-world experience that will help me in my future networking employment.

5.2 Recommendations/Suggestions for Future Strategies Actions:

An internship program introduces a person to the next life. It's important to make the switch from an academic to a professional life. It provides in-depth analysis and encourages applying academic knowledge to real-world situations. Students must fully grasp the relationship between value and price as well as the linkages between the technological and economic worlds.

Organization:

At the start of the internship, provide interns with a thorough orientation session to get to know the company, its culture, regulations, and processes. To help interns develop their abilities and gain useful experience, organizations should offer organized training and mentorship programs. This can include workshops, one-on-one mentorship, and on-the-job training. Interns should be given hard duties that are relevant to their academic background and career goals by organizations. They will acquire new abilities and practical experience as a result of this. Interns should receive frequent feedback and assessments from their employers so they can understand their performance and find opportunities for growth. Regular performance evaluations and one-on-one conversations with their managers are two ways to do this. In order to hire the top talent and provide interns with a great experience, companies should think about providing compensation and benefits to them, such as a monthly salary, health insurance, and paid days off.

University:

Universities should work more closely with companies to provide opportunities for students to obtain experience and practical knowledge. This will help reduce the knowledge gap between theoretical understanding and the actual abilities needed in the workforce. Universities should make sure that both students and host organizations are made aware of the goals and expectations of the internship program. This will make it easier to make sure that students are assigned to internships that are both pertinent to their career objectives and important to the company. Universities should routinely check in on and assess the internship program to make sure it is fulfilling its goals and giving students valuable learning opportunities. This might involve collecting feedback from intern supervisors, host organizations, and students. Universities' internship programs should be flexible and adaptive to fit the changing needs and trends of the job market. This may involve including new technology and tools in the internship program or offering internships in developing sectors.

Personal/Professional:

Setting specific goals and objectives for what I want to accomplish during the program is important before the internship even begins. I can utilize this to maintain my motivation and attention during the internship. It's important for me to take the initiative and request increased duties. This can assist me in developing new abilities and gaining useful experience. I should constantly ask for input from my supervisor and colleagues. I can use this to make the most of my learning opportunities and pinpoint areas where I need to improve. An opportunity to expand one's professional network should be taken advantage of during the internship. It's extremely important to go to networking events, add colleagues on Linked In, and

look for mentors who can offer advice and assistance. It's important to take some time to consider the things I've learned from the internship and evaluate how well I'm achieving my goals. I may use this to find out where I need to improve and create new objectives for the future.

Bibliography

[1] "Paradise group of industries," Accessed: 2023-09-26. [Online]. Available: https://en.wikipedia.org/wiki/Paradise_Group_of_Industries.

[2] "Paradise internet service provider," Accessed: 2023-09-26. [Online]. Available: https://paradiseisp.net/.