Tribhuvan University Faculty of Humanities and Social Science

INTERNSHIP REPORT ON

"Enterprise Support Department"

Submitted to

Department of Computer Application

United College

In partial fulfillment of the requirements for the Bachelors in Computer Application

Submitted by

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TU reg no: 6-2-421-2-2018

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Under the Supervision of

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Mentor's Recommendation

I hereby recommend that this project prepared under my supervision by **Rojan Tuladhar** in partial fulfillment of the requirements for the degree of Bachelor of Computer Application is recommended for the final evaluation.

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Tribhuvan University

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United College

Supervisor's Recommendation

I hereby recommend that this Internship Report prepared under my supervision by **Hikmat Rokaya** in partial fulfillment of the requirements for the degree of Bachelor of Computer Application is recommended for the final evaluation.

....

Mr. Hikmat Rokaya

SUPERVISOR

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Tribhuvan University

Faculty of Humanities and Social Science

United College

LETTER OF APPROVAL

This is to certify that this project prepared by **SAMRAT DHAKAL** in partial fulfillment of the requirements for the degree of Bachelor in Computer Application has been evaluated. In our opinion it is satisfactory in the scope and quality as a project for the required degree.

…………………………. **SIGNATURE of Supervisor** Mr. Hikmat Rokaya Department of Computer Application United College Kumaripati, Lalitpur.	…………………………… **SIGNATURE of Coordinator** Mr. Anup Shakya Department of Computer Application United College Kumaripati, Lalitpur.
………………….……… **Mentor Signature**	…………………….………………… **SIGNATURE of External Examiner** **External Examiner**

Acknowledgement

I would like to express my gratitude to all the people who gave me full support for completion for this internship. I would like to thanks my supervisor **Mr. Hikmat Rokaya**, Department of computer Application for his excellent supervision during internship work and proper guidance in preparation of the report.

I would like to express my gratitude and thanks to **Websurfer Nepal Communication System Pvt. Ltd**. for selecting me in their company to complete my internship in a wonderful working environment. Also, I would like to express sincere thanks to supervisors **Mr. Rojan Tuladhar** and **Mr. Lava Shrestha** at **Websurfer Nepal Communication System Pvt. Ltd**. for their continuous support and guidance. They have helped me in several ways to acquire knowledge about the related field.

Without their help, I would not have been able to fulfill my internship.

In the end, I would like to express my sincere thanks to each and every one of my colleagues, friends who directly or indirectly helped me during my internship journey.

Abstract

This report provides an overview of my internship experience as an Internet Service Provider (ISP) intern at Websurfer Nepal. The internship aimed to familiarize me with the ISP industry and its operations, while providing hands-on experience in network infrastructure support, customer support, service provisioning, performance monitoring, and documentation.

During the internship, I actively participated in maintaining and troubleshooting the ISP's network infrastructure, which included routers, switches, servers, and other networking equipment. I gained practical knowledge in configuring network devices, monitoring network performance, and resolving connectivity issues. Additionally, I actively engaged with customers, addressing their inquiries and technical issues, and providing assistance with internet connectivity problems and router configurations.

Furthermore, I contributed to the provisioning of internet services to new customers, verifying service availability, coordinating installations, and ensuring timely service activation. I also had the opportunity to monitor network performance, analyze traffic patterns, and identify areas for network optimization and improvement.

Throughout the internship, I diligently maintained accurate records and documentation related to network configurations, customer interactions, and troubleshooting procedures. This documentation proved invaluable in generating reports on network performance, customer feedback, and service quality metrics.

Overall, this internship experience at Websurfer Nepal allowed me to gain a comprehensive understanding of the ISP industry and develop essential skills in network infrastructure support, customer service, service provisioning, performance monitoring, and documentation. It provided a valuable platform for practical learning and prepared me for a career in the dynamic field of internet service provision.

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LIST OF ABBREVIATIONS

ABBS	Any Branch Banking System
AP	Access Point
DHCP	Dynamic Host Configuration Protocol
DIA	Dedicated Internet Access
DNS	Domain Naming System
EOC	Ethernet over Co-axial
IMAP	Internet Messaged Access Protocol
ISP	Internet Service Provider
IT	Information Technology
NOC	Network Operations Center
OSPF	Open Short Path First
POD	Point of Distribution
POP3	Post Office Protocol version 3
RFI	Radio-frequency interference
SM	Station Machine
SMTP	Simple Mail Transfer Protocol
VPN	Virtual Private Network
VSAT	Very Small Aperture Terminal
WDSL	Wireless Digital Subscriber Line
VoIP	Voice over Internet Protocol
WSN	Websurfer Nepal

Chapter 1: Introduction

1.1   Introduction

During my internship, I had the opportunity to immerse myself in the world of networking and gain invaluable experience in providing reliable internet services to customers.

As an intern at Websurfer Nepal, I was involved in various aspects of the ISP operations. I actively participated in network infrastructure support, where I gained hands-on experience in configuring network devices, monitoring network performance, and resolving connectivity issues. Additionally, I had the privilege of assisting customers by addressing their inquiries and technical concerns, ensuring their satisfaction and seamless internet connectivity.

I also contributed to service provisioning, where I verified service availability, coordinated installations, and ensured prompt service activation for new customers. Furthermore, I actively monitored network performance, collected data for analysis, and prepared comprehensive reports on network efficiency and customer feedback.

My internship at Websurfer Nepal provided me with a solid foundation in the ISP industry, honed my technical skills, and enhanced my problem-solving abilities. I am now eager to leverage my experiences and contribute to the field of networking and internet services in a professional capacity.

Websurfer Nepal (WSN) is an ISP which offers Internet and Intranet connections via different services mediums such as VSAT, Fiber Optics and wireless radio modems. WSN offers a broad spectrum of Internet backbone to a wide range of value-added broadband enabled application and satellite IP VPN services for corporate customers who require high performance continuous access services and bandwidth-on-demand broadband services.(Websurfer Nepal, n.d.)

1.2 Problem Statement

During my internship at Websurfer Nepal, I encountered a problem related to network latency, which was causing slow internet speeds for some customers. The problem statement was to identify the root cause of the latency issue and find a solution to improve network performance.

To tackle this challenge, I began by conducting a thorough analysis of the network infrastructure, including routers, switches, and server configurations. I used network monitoring tools to identify any bottlenecks or congestion points in the network. Additionally, I collected customer feedback and conducted surveys to understand their experiences and specific areas of concern.

After careful analysis, I discovered that outdated firmware on certain routers was causing the latency issue. To address this, I developed a plan to upgrade the firmware across affected routers, ensuring compatibility and minimal disruption to customer services. I collaborated with the network engineering team to execute the firmware upgrade process in a systematic manner, adhering to maintenance windows to minimize customer impact.

Post-upgrade, I monitored the network closely, conducting performance tests and gathering feedback from customers. The results indicated a significant improvement in network latency and enhanced internet speeds for the affected customers.

Throughout the process, I maintained clear communication with stakeholders, including the network team, customer support representatives, and management, to keep them informed of the progress and outcomes of the solution implementation.

By effectively addressing the network latency issue, I contributed to improving the overall customer experience and satisfaction, ensuring a smoother and faster internet service for Websurfer Nepal's customers.

1.3 Objectives

During the internship period, I had experienced on both the wireless and Fiber internet implementation and its working mechanisms.

However, the specific objectives of the study are:

- To understand the overall activities and working mechanisms in an ISP
- To troubleshoot the customer's queries

- To have knowledge on how internet works
- To make comparison between wireless and fiber internet access
- To analyze the technologies used in this industry and major advancements

1.4   Scope and Limitation

1.4.1   Scope

The internet is a global network of interconnected computers and servers that use standardized communication protocols to transmit data and information across the network. The scope of the internet is virtually unlimited and includes millions of devices and users worldwide. With an internet connection, users can access a vast array of online resources such as websites, social media platforms, email services, online storage services, and more. The internet has revolutionized the way people communicate, access information, and conduct business across the globe.

An intranet is a private network that is designed to be used by a specific organization or company. The scope of an intranet is limited to the internal users and resources of the organization or company. It is used for sharing information, collaboration, and communication within the organization. An intranet is typically protected by security measures such as firewalls, user authentication, and encryption to ensure that only authorized users can access the network. Intranets can be used to store and share confidential data, collaborate on projects, and streamline workflows within an organization. (WhatIs.Com., n.d.)

1.4.2   Limitation

Every study has some limitations. The following are the major limitations of the study:

- There were some restrictions in disclosing some information as it was assumed to be confidential. Therefore, I could not include those in my report.
- Some of the information that I got from secondary sources were not arranged consistently.

1.5 Report Organization

The main report is organized in a chapter-wise manner. The report consists of five different chapters.

Chapter 1: Introduction

Introduction relay on the very first component of report organization. Here, deals about general introduction of the system. It answers "what the system is?", "What this system does?" It also states problem of statement what existing problem lags. Objective of the project, scope and limitation in detail.

Chapter 2: Introduction to organization

It this title it describes the details of the organization and its hierarchy. It includes working domains of the organization and talks about the intern department or unit.

Chapter 3: Background study and literature review

This chapter includes project related theories, general concepts and study of preexisting similar projects. It consists of the research works for the system.

Chapter 4: Internship activities

In this part talks about what roles and responsibilities participants played and their weekly log. It deals about the description of project which is involved during internship and the tasks or activities performed while doing this project.

Chapter 5: Conclusion and Future Recommendations

This chapter include conclusion and learning outcomes.

Chapter 2: Introduction to Organization

2.1 Organization Details

Websurfer Nepal Communication Pvt. Ltd is a dynamic and fast-growing ISP in Kathmandu (Websurfer Nepal, n.d.). It is an establishment that originated from Websurfer UK and prides itself on keeping up with the latest internet technology, equipment, and services.

Websurfer Nepal (WSN) offers internet and intranet connections through various service mediums such as VSAT, fiber optics, and wireless radio modems (Websurfer Nepal, n.d.). WSN caters to a wide range of customers, providing internet backbone, value-added broadband-enabled applications, and satellite IP VPN services for corporate clients who require high-performance continuous access and bandwidth-on-demand broadband services.

The company is known for providing affordable, reliable, and fast cable internet and wireless internet services in major cities of Nepal, including Kathmandu, Patan, Lalitpur, and Bhaktapur (Websurfer Nepal, n.d.). WSN has expanded its fiber optic cable internet coverage to reach various locations in these cities, ensuring the fastest internet connection possible.

Websurfer Nepal is committed to providing value for money and excellent service to individuals, companies, and organizations in Nepal (Websurfer Nepal, n.d.). Their solutions range from comprehensive wireless internet services, dedicated network connections between locations, access to the outside world through dedicated VSAT systems, and various services such as VSAT networks, dial-up internet, cable internet, wireless hotspots, wireless internet, and web hosting.

The company takes pride in its unique and open approach, providing the necessary business model required by its clients (Websurfer Nepal, n.d.). WSN believes in delivering new and affordable products to customers as its success relies on customer satisfaction.

2.2 Organizational Hierarchy
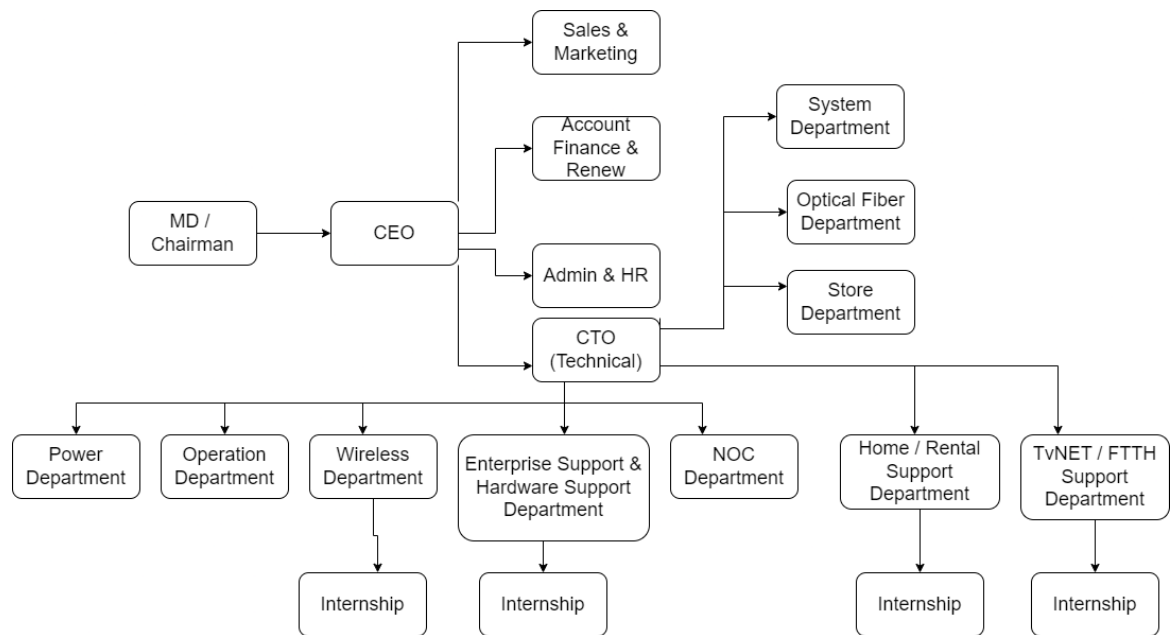
Figure 2.1 Organizational Structure

2.3 Working Domains of Organization

Following are the contact details of the Websurfer Nepal Communication Pvt. Ltd.

WSN has separate department for handling separate jobs categorized as Power Department, Operation Department, Wireless Department, Store Department, Support Department System Department, NOC Department, Optical Fiber Department.

The company accepts the client's request through online or physical medium and then separate the task according to the job's category which is then passed down to the respective department.

Each department completes their respective jobs and is send directly to the client.

2.4 Description of Intern Development/Unit

Many problems arise in ISPs. The author analyzed many problems such as fiber down due to power issues, road construction etc. and sometimes no internet in the corporate because of loose connection or due to media converter. These problems are solved through phone call, if the problem is not solved in the phone conversation, then the staff will raise ticket to another staff. For example, If the problem arises in the fiber, then the staff will raise the ticket to the fiber team.

Another way of looking if the problem has raised or not is through port monitoring which is shown in the figure below:

Figure 2.2 Port Monitoring of Inside Valley

Chapter 3: Background Study and Literature Review

3.1 Background Study

There are several Internet Service Providers (ISPs) operating in Nepal, catering to the diverse connectivity needs of individuals and businesses across the country. These ISPs include the government-owned Nepal Telecom, as well as privately owned entities like WorldLink Communications, Vianet Communications, and Subisu Cablenet, among others. Among them, Nepal Telecom holds the distinction of being the oldest and largest ISP in Nepal, enjoying a significant market share in the country's internet service industry (National Broadcasting and Telecommunications Commission, 2022).

ISPs in Nepal offer a wide range of internet connectivity services to their customers. These services encompass broadband internet, wireless internet, leased line connections, and Wi-Fi hotspot services. While the availability of various options is beneficial, the cost of internet services in Nepal tends to be relatively high when compared to neighboring countries in the region. This disparity can primarily be attributed to the lack of robust infrastructure and the high cost associated with establishing and maintaining internet connectivity (Bhandari, 2022).

Nevertheless, ISPs in Nepal have been actively addressing these challenges and taking steps to expand their services to rural and remote areas of the country. Thanks to the government's initiatives aimed at improving digital infrastructure and increasing internet accessibility throughout Nepal, ISPs have been able to extend their reach beyond urban centers. This expansion of internet services to previously underserved regions has had a transformative impact on the lives of individuals and businesses in these areas, empowering them with access to information, communication, and opportunities previously unavailable to them (Ministry of Communications and Information Technology, 2022).

In conclusion, ISPs in Nepal play a crucial role in bridging the digital divide by providing internet connectivity services to individuals and businesses throughout the country. Despite the challenges posed by infrastructure limitations and the cost of internet connectivity, ISPs have shown a commendable commitment to expanding their services and ensuring that more people, particularly in rural areas, can reap the benefits of being connected. Through their efforts, ISPs in Nepal contribute to the overall progress and development of the nation's digital landscape (Ministry of Communications and Information Technology,2022; National Broadcasting and Telecommunications Commission, 2022; Bhandari, 2022).

3.2 Literature Review

Internet Service Providers (ISPs) have become a vital part of the digital infrastructure in Nepal. They provide internet connectivity services to individuals and businesses across the country. Nepal has a relatively low internet penetration rate compared to other countries in the region. The country has a total of 44 ISPs, with the government-owned Nepal Telecom being the largest and oldest ISP in the country (Bhandari, 2022).

ISPs in Nepal offer various types of internet connectivity services, including broadband internet, wireless internet, leased line, and Wi-Fi hotspot services. Broadband internet is the most commonly used type of service, followed by wireless internet (Ministry of Communications and Information Technology, 2022).

The cost of internet services in Nepal is relatively high compared to other countries in the region. This is mainly due to the lack of infrastructure and the high cost of internet connectivity. The country also faces challenges in terms of electricity supply and network downtime. The lack of digital literacy among the population is another challenge that ISPs face (Bhandari, 2022).

Despite the challenges, ISPs in Nepal have been actively expanding their services to rural areas and remote regions in the country. This is mainly due to the government's initiatives to improve digital infrastructure and increase internet connectivity across the country. The introduction of 4G and 5G technology is expected to increase internet penetration in the country, providing new opportunities for ISPs to expand their services (Ministry of Communications and Information Technology, 2022).

In conclusion, ISPs in Nepal play a critical role in providing internet connectivity services to individuals and businesses in the country. Despite facing various challenges, ISPs have been actively expanding their services, thanks to the government's initiatives to improve digital infrastructure and increase internet connectivity across the country. The introduction of 4G and 5G technology is expected to provide new opportunities for ISPs to expand their services and increase internet penetration in the country (Bhandari, 2022; Ministry of Communications and Information Technology, 2022).

Chapter 4: Internship Activities

4.1 Roles and Responsibilities

An enterprise support department in an ISP (Internet Service Provider) is a team responsible for providing technical assistance and support to corporate clients, typically businesses, that require more advanced and tailored internet services than individual consumers. The enterprise support team is responsible for maintaining the ISP's network infrastructure and ensuring that it is performing optimally to meet the needs of the business clients.

I was solely involved in Technical Support department and was responsible for monitoring all the network PODs and used to remotely access routers and switches using telnet and SSH protocol through Secured CRT.

I was responsible for the day-to-day management and maintenance of the ISP's network infrastructure. This includes overseeing network configurations, managing IP address allocation, monitoring network performance, and ensuring optimal network security.

I provided advanced technical support to customers and assist in troubleshooting complex network and connectivity issues. This involves analyzing network logs, conducting tests, and working closely with the customer support team to deliver prompt resolutions.

I played a role in optimizing the network infrastructure for improved performance and efficiency. This involve analyzing network traffic patterns, implementing Quality of Service (QoS) measures, and identifying areas for network upgrades or enhancements.

I was responsible for maintaining comprehensive documentation of network configurations, troubleshooting procedures, and network policies. Additionally, I generated reports on network performance, customer satisfaction, and service quality metrics to track and improve the ISP's operations.

4.2 Weekly Log (Technical Details of Activities)

Enterprise Support Department

Week	Duration	Activities
1	1 Sep, 2022 To 9 Sep, 2022	Thoroughly research of platform and resources.
		Researched about various networking software.
		WSN main network diagram.
2	11 Sep, 2022 To 16 Sep, 2022	wireless networking devices.
		Studying Accessing AP of the ISP tower and SM at client's end.
		Signal strength, TX/RX rate of AP and SM device.
3	18 Sep, 2022 To 23 Sep, 2022	Configuring AP and SM.
		Accessed admin panel of AP and SM for establishing connections. Troubleshooting connections, checking Pings.
		Going through AP and SM information details. Observing root cause of errors in establishing best connection.
4	25 Sep, 2022 To 30 Sep, 2022	CAT Cable connection with RJ 45 and Optical Fiber
		Joining CAT 6 cable and RJ 45 through clamper. Basic knowledge of optical fiber cable types
		Ethernet cable Color-coded wiring sequences. single mode, multimode optical fiber
5	9 Oct, 2022 To 14 Oct, 2022	Optical Fiber
		Fiber splicing, fiber connection connectors.
		Fiber connection connectors types, splicing kit observation single mode, multimode optical fiber cable.
6	16 Oct, 2022 To	VoIP
		Connecting IP phones, installing softphones application

	21 Oct, 2022	call routing, call recording, conference calls, call forwarding, voicemail, instant messaging
7		Configuring Mikrotik router
	31 Oct, 2022 To 4 Nov, 2022	router's IP address (the default is 192.168.88.1). default username "admin" and the default password "blank".
		Checking NAT (Network Address Translation) and creating NAT rules to translate private IP addresses to public IP addresses.
8		POD NMS
	6 Nov, 2022 To 11 Nov, 2022	The POD NMS application used in the organization is horizon openNMS. POD NMS is used for monitoring all the network PODs as well as creating availability reports
9	13 Nov, 2022 To 18 Nov, 2022	Secured CRT
		Securely access remote systems, Manage multiple sessions, Monitor and troubleshoot network connections.
		It is an application which is used to remotely access routers and switches using telnet and SSH protocol.
10	22 Nov, 2022 To 30 Nov, 2022	Cacti
		Data collection, Graphing, Thresholds and alerts
		Cacti is an open-source network monitoring tool that allows you to collect and graph data from a wide range of devices and applications
11	1 Dec, 2022 To 16 Dec, 2022	Ticket Management System (TMS)
		Creating tickets, assigning tickets, tracking tickets, Prioritizing tickets
		TMS can help organizations improve customer satisfaction, reduce response times, and increase efficiency by automating workflows and providing actionable insights.
12	18 Dec, 2022	Call Support to NIC ASIA BANK LIMITED
		Network connectivity, Network monitoring and maintenance, IP addressing and management.

	To 30 Dec, 2022	The ISP's support services can help the bank improve productivity, reduce downtime, and enhance the security of their network.

Mentor's Approval

_____

Mr. Rojan Tuladhar

Enterprise Monitoring & Support Department

Websurfer Nepal Communication System Pvt. Ltd

Dhumbarahi Height,

Kathmandu, Nepal.

4.3   Description of the Project Involved During Internship

The organization allowed intern to work for 6 days a week i.e., from Sunday to Friday. For the initial week interne was introduced to the various areas of the department of the organization and internee was allowed to settle in the environment by letting intern to study and analyze the various tools and applications used in the organization, overview of the network model, its links, IT infrastructure of the Websurfer Nepal Communication Pvt. Ltd. Intern studied about the basic networking concepts and tools used in the organization.

After initial week, the organization also helped to explore more about the links, IT department activities such as sub netting, switch commands and troubleshooting.

Supervisor also helped the intern to explore more about the links – fiber and wireless and got in- depth knowledge about how to troubleshoot if any problem arises.

Intern also got to know the working mechanism about the IT department of Websurfer Nepal Communication Pvt. Ltd.

Intern also got the chance to explore more about configuring a Mikrotik router, bridge configuration, DNS and DHCP configuration and hotspot configuration. Besides this, internee knowledge of IT by working at Websurfer Nepal Communication Pvt. Ltd, internee primary job was to help senior officers in troubleshooting real world problems.

4.4   Task / Activities Performed

During internship period, intern often observed the organization to know about the existing system and analyze for new requirement. Regular interviews were conducted with the authorized officials and staff members. After collecting all the relevant information, intern started generating overall idea about the system. The following activities were carried out during the three-month time span:

Ubiquiti NanoStation configuration:

The Ubiquiti NanoStation is a line of wireless outdoor access points designed for point-to-point (PtP) and point-to-multipoint (PtMP) wireless network deployments. These devices are popular in applications such as long-range wireless links, bridging networks, and extending Wi-Fi coverage over large areas
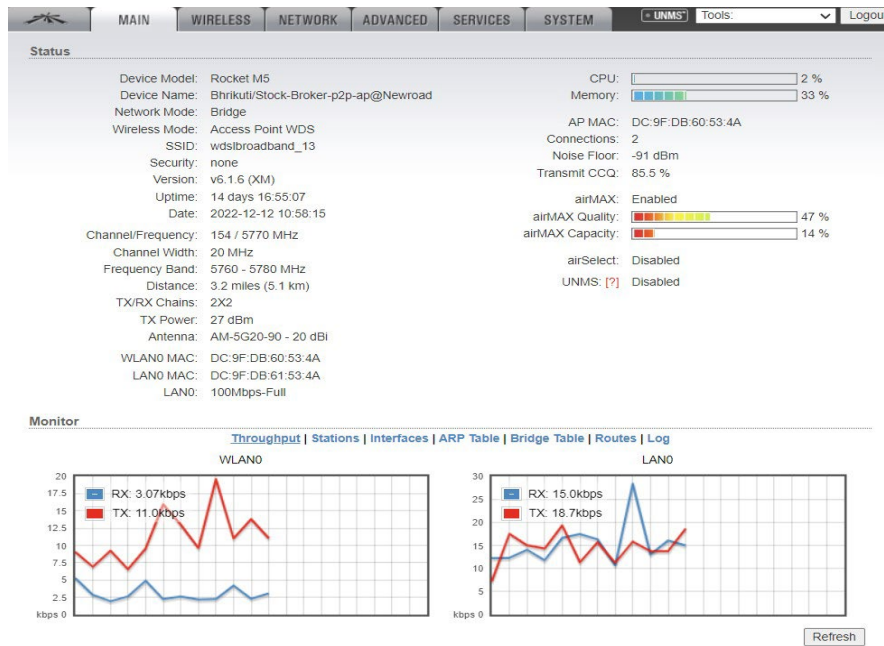
Figure 4.4.1 Wireless AP
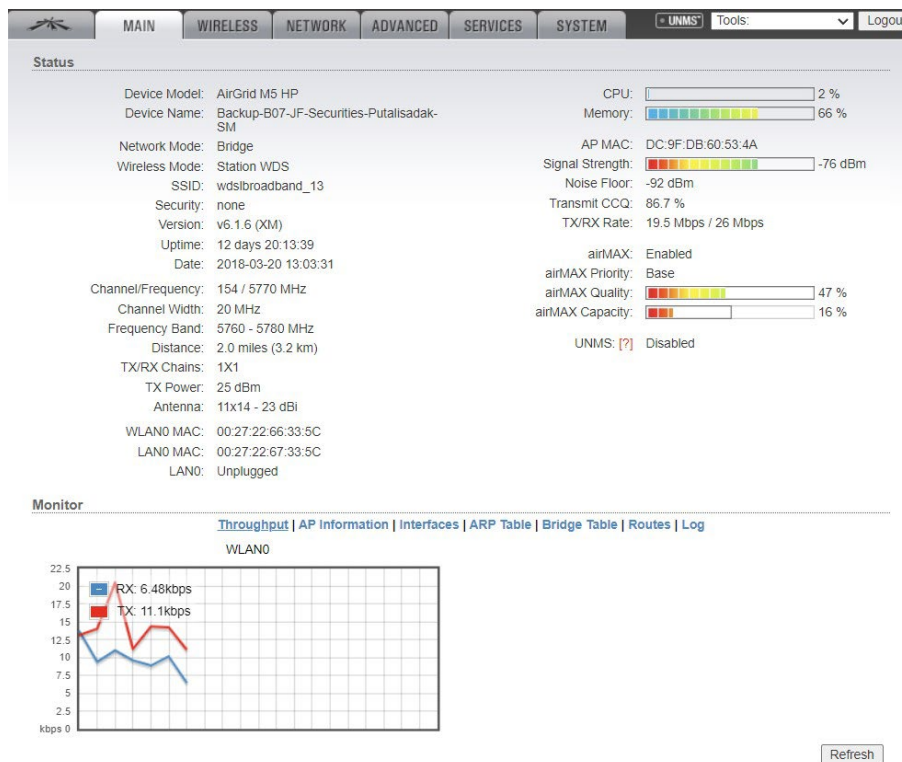
Figure 4.4.2 Wireless SM

Nagios

Nagios monitors entire IT infrastructure to ensure systems, applications, services, and business processes are functioning properly. In the event of a failure, Nagios can alert technical staff of the problem, allowing them to begin remediation processes before outages affect business processes, end-users, or customers.

Nagios has been used in the organization for the purpose of monitoring, reporting availability and the employees must update IP address of devices to be monitored. It is used for wireless devices, server monitoring and port monitoring of routers and switches.

Figure 4.4.3 Monitoring of Down Devices inside valley

Figure 4.4.4 Outside Valley Port Outage

Cacti:

Cacti is a complete network graphing solution designed to harness the power of RRDTool's data storage and graphing functionality. Cacti provides a fast poller, advanced graph templating, multiple data acquisition methods, and user management features out of the box. All of this is wrapped in an intuitive, easy to use interface that makes sense for LAN-sized installations up to complex networks with thousands of devices. Cacti has been used for traffic monitoring of routers, switches and server's port.
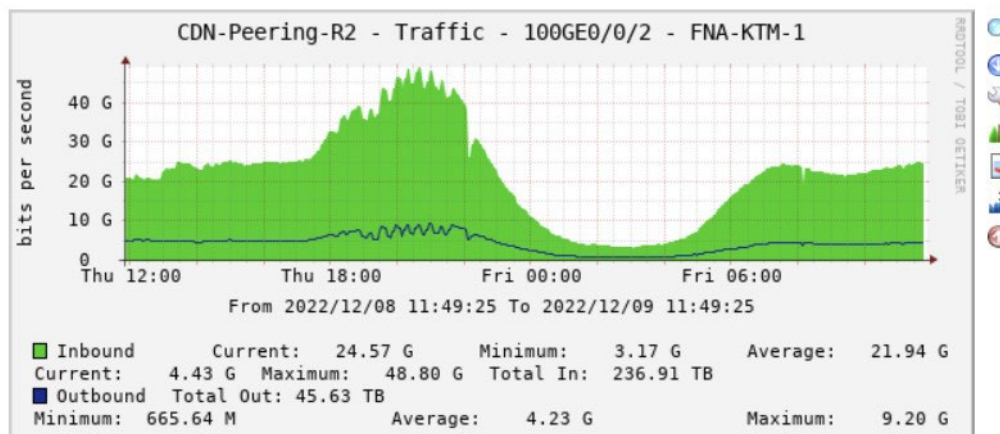
Figure 4.4.5 Cacti

POD NMS

POD NMS is used for monitoring all the network PODs as well as creating availability reports. The POD NMS application used in the organization is horizon openNMS.
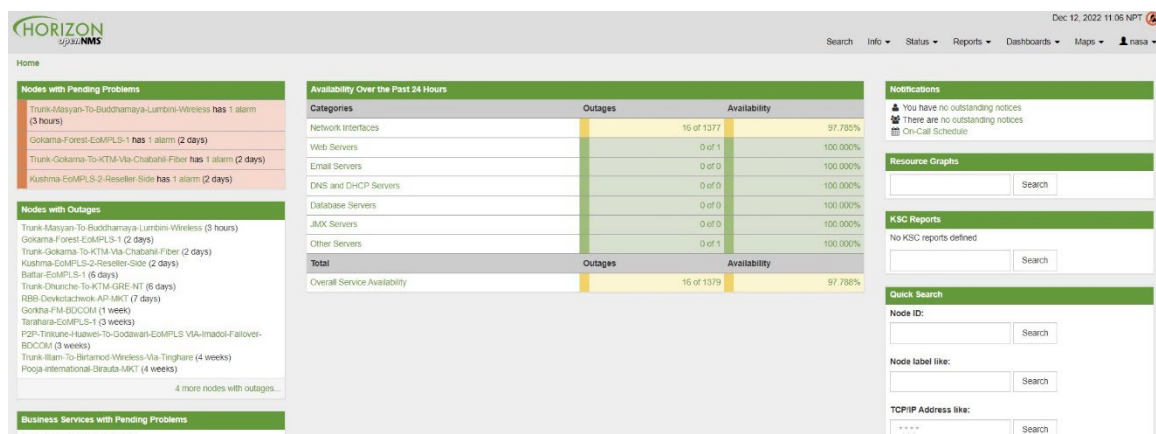
Figure 4.4.6 POD NMS

Secured CRT:

It is an application which is used to remotely access routers and switches using telnet and SSH protocol.

Figure 4.4.7 Secured CRT - port briefing command

Ticket Management System (TMS):

The ticket management system ensures that communication is centralized and information is tracked faster and easier. It combines many important tools that guarantee a seamless resolution of problems. This system automates processes, so it saves many time. It allows customer representatives to stay organized, efficient and helpful.

Figure 4.4.8 Ticket Management System (TMS)

Chapter 5: Conclusion and Learning Outcomes

5.1 Conclusion

In conclusion, my internship experience at WebSurfer Nepal, an Internet service provider, has been invaluable in shaping my understanding of the industry and enhancing my skills. During my time there, I gained practical knowledge about various aspects of providing internet services to customers.

Working closely with the team, I learned about the importance of reliable network infrastructure, customer support, and technical troubleshooting. I had the opportunity to engage with customers and address their concerns, which helped me develop strong communication and problem-solving skills.

Additionally, I gained insights into the rapidly evolving field of internet technology, including emerging trends and advancements. This exposure allowed me to witness firsthand the impact of the internet on people's lives and businesses, highlighting its significance in today's digital age.

Overall, my internship at WebSurfer Nepal provided me with a comprehensive understanding of the internet service provider industry and equipped me with the practical skills necessary to excel in this field. I am grateful for the opportunity and confident that this experience will greatly contribute to my future professional endeavors.

5.2 Learning Outcomes

During the internship period, the working mechanism of the fiber and wireless were known. Talking about the technical gain, the knowledge on VLANs was obtained. Similarly, the knowledge about the wireless and fiber internet access was known in details with its mechanism and implementation. The I also learnt the working mechanism of the ISP. The internship has proved to be a good learning platform.

Those three-month period of time was my learning phase for the working environment that I will face in future. IT didn't only taught me about the practicality about the knowledge that I had and been receiving but also about the working behavior that I was in need have.

It gave the platform to judge skill and develop capability to apply the learned knowledge into actual practice. The author is now more visualized about the be as he used to think it

was before. It is the idea, concept, innovation of Internship that leads the organization to success.
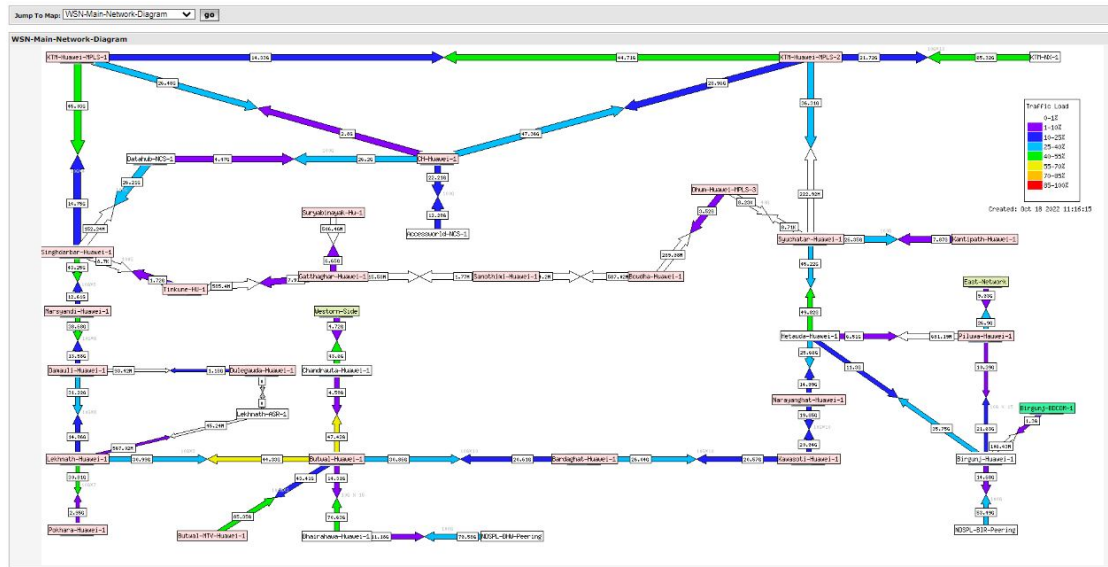
Internship at Websurfer Nepal provided me with the following aspects:

- Developing the interpersonal, managerial and entrepreneurial skills that are crucial in every professional and employee career development.
- Got an opportunity to study and analyze the network structure of different organizations and got chance to implement and maintain networking devices.
- The importance of time and punctuality.
- Got information on various devices and technologies used in the organization and their functions about how they work.
- Learned to work under extreme pressure and time constraint, which has helped in building self-confidence.
- Each employee must be given freedom to rate their performance themselves, this will reduce absenteeism, laziness, conflicts and enhances their performance.

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Appendix

WSN main network diagram

Cacti

Wireless Monitoring

Wireless AP
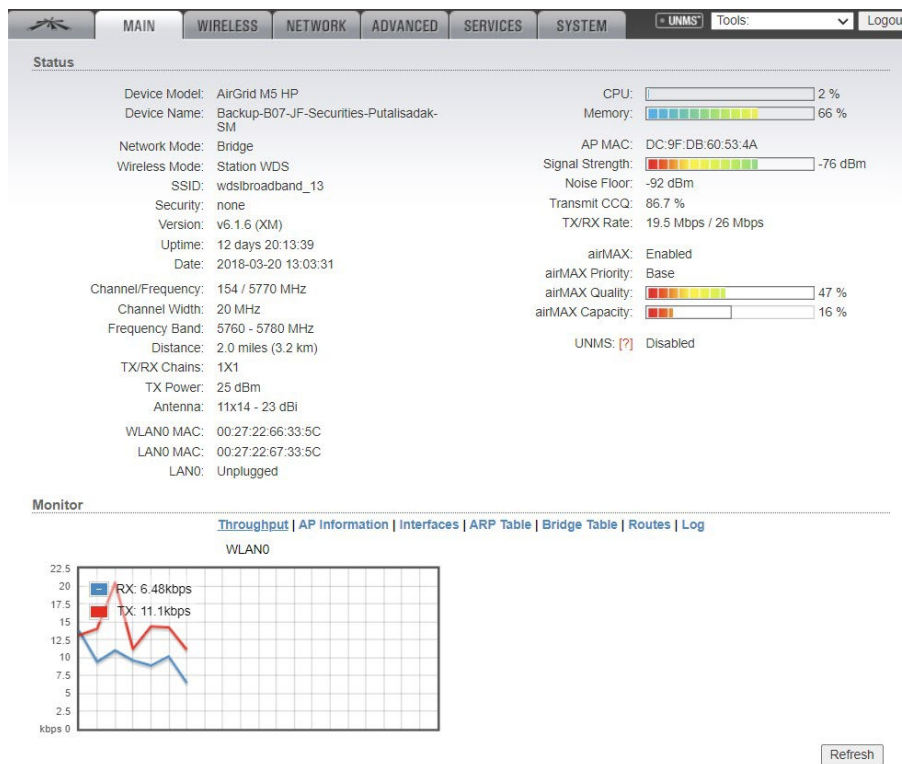
Wireless SM

Service Status Details For Host Group 'Port_Monitoring_Inside_Valley'

Display Filters:
Host Status Types: All
Host Properties: Any
Service Status Types: Ok
Service Properties: Any

Limit Results: All

Host	Service	Status	Last Check	Duration	Attempt	Status Information
Balaju-BDCOM-2	int_0/10	OK	12-12-2022 11:37:32	6d 22h 7m 52s	1/5	Ok - Interface GigaEthernet0/10 - COR-24465-Kasthmandap-Dairy-Balaju[DDC] is Up
	int_0/11	OK	12-12-2022 11:37:27	10d 9h 7m 56s	1/5	Ok - Interface GigaEthernet0/11 - COR-33457-NIC-Asia-Bank-Manamaiju is Up
	int_0/15	OK	12-12-2022 11:38:10	6d 16h 47m 12s	1/5	Ok - Interface GigaEthernet0/15 - Citizen-Bank-Samakushi is Up
	int_0/16	OK	12-12-2022 11:38:06	3d 13h 27m 18s	1/5	Ok - Interface GigaEthernet0/16 - Smart-City-Technology-Pvt-Ltd-Balaju is Up
	int_0/17	OK	12-12-2022 11:36:41	10d 9h 48m 42s	1/5	Ok - Interface GigaEthernet0/17 - CUID-1763081-Nepal-Hilltop-Industries-Pvt-Ltd[Nepatop]-Samakushi is Up
	int_0/18	OK	12-12-2022 11:38:16	6d 16h 47m 8s	1/5	Ok - Interface GigaEthernet0/18 - COR-26042-RBB-Balaju is Up
	int_0/22	OK	12-12-2022 11:38:11	6d 16h 47m 12s	1/5	Ok - Interface GigaEthernet0/22 - COR-34982-NIC-ASIA-ATM-Gongabu-BG-Mall is Up
	int_0/24	OK	12-12-2022 11:38:11	1d 3h 12m 12s	1/5	Ok - Interface GigaEthernet0/24 - Pooja-International-Balaju is Up
	int_0/27	OK	12-12-2022 11:38:14	6d 16h 47m 9s	1/5	Ok - Interface GigaEthernet0/27 - Oasis-Broadband-Samakhushi-Internet-ISP is Up
	int_0/29	OK	12-12-2022 11:39:09	10d 9h 51m 19s	1/5	Ok - Interface GigaEthernet0/29 - Nayabazar-Branch-OLT is Up
	int_0/6	OK	12-12-2022 11:37:22	6d 16h 47m 9s	1/5	Ok - Interface GigaEthernet0/6 - Balaju-MKT-3-(172.16.17.190) is Up
	int_1/1	OK	12-12-2022 11:37:27	10d 9h 7m 56s	1/5	Ok - Interface TGigaEthernet1/1 - Trunk-Balaju-NCS is Up
Balaju-NEA-BDCOM-2	int_0/1	OK	12-12-2022 11:39:37	3d 23h 10m 48s	1/5	Ok - Interface GigaEthernet0/1 - 100G-MUX-Testing-192.168.200.81 is Up
	int_0/10	OK	12-12-2022 11:36:26	4d 4h 3m 59s	1/5	Ok - Interface GigaEthernet0/10 - COR-34928-NIC-Asia-Bhatbhateni-Balaju is Up
	int_0/13	OK	12-12-2022 11:36:47	0d 23h 23m 36s	1/5	Ok - Interface GigaEthernet0/13 - SMS-ID-1108675-Surya-Life-Insurance-Balaju is Up
	int_0/2	OK	12-12-2022 11:35:17	1d 16h 0m 8s	1/5	Ok - Interface GigaEthernet0/2 - Power-Check[172.16.62.100] is Up
	tg_0/1	OK	12-12-2022 11:36:36	86d 4h 43m 51s	1/5	Ok - Interface TGigaEthernet0/1 - Banasthali-Huawei-1 is Up
Basbari-SW-2	PING	OK	12-12-2022 11:37:06	2d 3h 18m 21s	1/5	PING OK - Packet loss = 0%, RTA = 1.66 ms
	int_Y	OK	12-12-2022 11:37:05	16d 4h 58m 19s	1/5	OK - Interface rnet0/9- Instance currently exists at this OID is up.

Monitoring of Down Devices inside valley

PORT MONITORING

Monitoring
- Tactical Overview
- All Switches
- Down Switches
- All Interfaces
- Inside Valley Outage
- Outside Valley Outage
- Admin Down/ No Description
- FTTX Monitoring

Reporting
- Trends
- Availability
- Alert Histogram
- Alert History
- Alert Summary
- Notifications
- Event Log

Configuration
- Admin Panel

Current Network Status
Last Updated: Mon Dec 12 11:04:59 +0545 2022
Updated every 30 seconds
Nagios® Core™ 4.4.3 - www.nagios.org
Logged in as nagiosadmin

View Service Status Detail For All Host Groups
View Host Status Detail For This Host Group
View Status Overview For This Host Group
View Status Summary For This Host Group
View Status Grid For This Host Group

Host Status Totals: Up 98 Down 1 Unreachable 0 Pending 0
All Problems 1 All Types 99

Service Status Totals: Ok 629 Warning 2673 Unknown 0 Critical 61 Pending 0
All Problems 2734 All Types 3363

Display Filters:
Host Status Types: All
Host Properties: Any
Service Status Types: Critical
Service Properties: Any

Limit Results: All

Service Status Details For Host Group 'Port_Monitoring_Outside_Valley'
Entries sorted by state duration (ascending)

Host	Service	Status	Last Check	Duration	Attempt	Status Information
Pakhribas-BDCOM-1	int_0/3	CRITICAL	12-12-2022 11:04:49	0d 0h 5m 10s	5/5	Critical - Interface GigaEthernet0/3 - access is Down
Sunwai-BDCOM-1	int_1/2	CRITICAL	12-12-2022 11:04:11	0d 0h 25m 48s	2/5	Critical - Interface TGigaEthernet1/2 - Khairen-BDCOM-1:Tg1/2 is Down
	int_0/11	CRITICAL	12-12-2022 11:00:25	0d 0h 49m 39s	5/5	Critical - Interface GigaEthernet0/11 - Raj-TV-Bhumai_OLT is Down
	int_0/7	CRITICAL	12-12-2022 11:02:10	0d 1h 17m 55s	5/5	Critical - Interface GigaEthernet0/7 - Sunwal-Raj-TV-Center-OLT-4 is Down
	int_0/6	CRITICAL	12-12-2022 11:04:42	0d 1h 35m 23s	5/5	Critical - Interface GigaEthernet0/6 - Sunwal-Raj-TV-Center-OLT-3 is Down
	int_1/4	CRITICAL	12-12-2022 11:02:38	0d 1h 52m 23s	5/5	Critical - Interface TGigaEthernet1/4 - Pats-Network-Parasi-BDCOM is Down
	int_0/8	CRITICAL	12-12-2022 11:04:07	0d 3h 15m 52s	5/5	Critical - Interface GigaEthernet0/8 - Sunwal-Raj-TV-Center-OLT-5 is Down
Shivanagar-BDCOM	int_0/2	CRITICAL	12-12-2022 11:02:17	0d 4h 42m 42s	5/5	Critical - Interface GigaEthernet0/2 - Reseller-PPPoE is Down
Pokhara-BDCOM-2	tg_0/1	CRITICAL	12-12-2022 11:03:57	0d 12h 11m 2s	5/5	Critical - Interface TGigaEthernet0/1 - SMSID-1722379-Airlink-Communication-Service-Provider-Chipledhunga is Down
Birgunj-BDCOM-1	int_0/18	CRITICAL	12-12-2022 11:02:02	1d 10h 27m 58s	5/5	Critical - Interface GigaEthernet0/18 - CUID-1762857-Beni-Communication-Pvt.Ltd-Birgunj-Intranet is Down
Letang-MTV-BDCOM	int_0/8	CRITICAL	12-12-2022 11:04:51	1d 17h 55m 8s	5/5	Critical - Interface GigaEthernet0/8 - CUID-1717835-Pathibhara-Network-Pvt.Ltd-Letang-Intranet is Down

Outside Valley Port Outage

HORIZON openNMS

Dec 12, 2022 11:06 NPT

Search   Info ▾   Status ▾   Reports ▾   Dashboards ▾   Maps ▾   nasa ▾

Home

Nodes with Pending Problems
- Trunk-Masyan-To-Buddhamaya-Lumbini-Wireless has 1 alarm (3 hours)
- Gokarna-Forest-EoMPLS-1 has 1 alarm (2 days)
- Trunk-Gokarna-To-KTM-Via-Chabahil-Fiber has 1 alarm (2 days)
- Kushma-EoMPLS-2-Reseller-Side has 1 alarm (2 days)

Nodes with Outages
- Trunk-Masyan-To-Buddhamaya-Lumbini-Wireless (3 hours)
- Gokarna-Forest-EoMPLS-1 (2 days)
- Trunk-Gokarna-To-KTM-Via-Chabahil-Fiber (2 days)
- Kushma-EoMPLS-2-Reseller-Side (2 days)
- Battar-EoMPLS-1 (6 days)
- Trunk-Dhunche-To-KTM-GRE-NT (6 days)
- RBB-Devkotachowk-AP-MKT (7 days)
- Gorkha-FM-BDCOM (1 week)
- Tarahara-EoMPLS-1 (3 weeks)
- P2P-Tinkune-Huawei-To-Godawari-EoMPLS VIA-Imadol-Failover-BDCOM (3 weeks)
- Trunk-Illam-To-Birtamod-Wireless-Via-Tinghare (4 weeks)
- Pooja-International-Birauta-MKT (4 weeks)

4 more nodes with outages...

Business Services with Pending Problems
There are no pending problems.

Availability Over the Past 24 Hours

Categories	Outages	Availability
Network Interfaces	16 of 1377	97.785%
Web Servers	0 of 1	100.000%
Email Servers	0 of 0	100.000%
DNS and DHCP Servers	0 of 0	100.000%
Database Servers	0 of 0	100.000%
JMX Servers	0 of 0	100.000%
Other Servers	0 of 1	100.000%
Total	**Outages**	**Availability**
Overall Service Availability	16 of 1379	97.788%

Notifications
- You have no outstanding notices
- There are no outstanding notices
- On-Call Schedule

Resource Graphs
Search

KSC Reports
No KSC reports defined
Search

Quick Search
Node ID:
Search
Node label like:
Search
TCP/IP Address like:
Search

Horizon openNMS

Secured CRT - port briefing command

Ticket Management System