OFFICE NETWORK MANAGEMENT SYSTEM BASED ON COMMAND LINE INTERFACE ENVIRONMENT

BY

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science and Engineering.

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APPROVAL

This internship titled "Office Network Management System Based on Command Line Interface Environment", Submitted by Md. Anamul Haque, ID NO: 152-15-5857 to the Department of Computer science and Engineering, Daffodil International University, has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in computer science and Engineering and approved as to its style and contents. The presentation took place in 7th December 2019.

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DECLARATION

I declare that, this internship report is prepared by me, Name: Md.Anamul Haque ID No: 152-15-5857 to the department of Computer Science and Engineering, Daffodil International University. Under the supervision of **Md. Tarek Habib, Assistant Professor, Department of CSE,** Daffodil International University. I also declare that neither this internship report nor any part of this internship report has been submitted for award of any Degree or Diploma. I also declare that, I collect the information at 4K Engineering Limited, Books and Internet.

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ABSTRACT

Internet service provider (ISP) is search a company that provides Internet connections and services to individuals and organizations. ISPs are all connected to each other through network access points, public network facilities on the Internet backbone. I heard 4Kengineering Limited has gave me the opportunity for ISP and Office Management System based on Mikro-Tik & Linux platform etc. Linux is continually considered a very secure operating system. Mikro-Tik is one of the very popular platforms in digital Bangladesh. We can do almost the whole lot the usage of Mikro-Tik which include router static connection, DHCP connection, website blocks etc. In this report typically the detailed steps for configuring the Linux and Mikro-Tik has been described.

.

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CHAPTER 1 INTRODUCTION

1.1 Introduction

ISP server configuration of Linux and MikroTik platform, Cisco switch, Wi-Fi router configuration & be aware of about cambium networks this is the principal aim of my internship application is to put together myself as a skilled individual in professional. So internship is very indispensable for me. I favor to attain quite specific fine to show myself. It covers superior skills for the Linux expert that. This aim consists of the capability to manipulate a running server and configuring. Linux with clear learning two of offerings to be used. It covers primary capabilities for the Linux professional. Banking depend on sever system, international card . Every business and e-commerce today has a whole lot to do with software-based conversation , internet technological know-how is additionally a very beneficial server , with the aid of the usage of this gadget we can operate a variety of sorts of services.

1.2 Motivation

My internship program influenced B.Sc. students following tiers at Computer Science, IT Directorate of Science and Technology. The internship does now not only supply experience however additionally teaches a student how to communicate, how to work properly, how to preserve authentic requirements. As an intern, I am magisterial of myself. An internship gives me widespread knowledge, big skill improvement in networking sites. An internship can make a student responsible and professional. A student can take an area ride by doing an internship. As a result, the internship grows the capacity Networking is my first choice due to the fact I am interested in computer networking and I am especially determined I desire to construct my profession as a records technological know-how engineer. Information science engineers very demandable in the first world is too excessive and statistics technology is turning into a prior challenge in our country also. If we make a robust networking system then we grant a "Digital Bangladesh" other way is not possible.

1.3 Internship objectives

The essential goal of my internship application is a perception of a contemporary prerequisite of the job market and also to put together skilled individual in a competitive job place. The internship is very fundamental for ability improvement. To attain some exclusive fantastic and real-life job experience in order to prove myself as a skilled one internship. It has a large effect on our IT sector, we will in a position to use the Internet, Software export, Call center, E-Commerce, Tele -Education, Video Conferencing more vastly. By identifying these elements we can be certain about the progressive change over our IT sector, throughout our working time in 4K Engineering we achieved a number of experiences and knowledge. Here are some objectives of the internship.

1.4 Introduction to the Company

Kartick, a civil engineering graduate from BUET started working in construction industry back in 1990. Kartick has been involved in the design, construction and delivery of many prestigious buildings across a number of sectors including textiles, Garments, Chemicals, heavy and light engineering and Sports. This balanced understanding of every aspect of a building allows Kartick to design iconic structures that meet both stringent regulations and any number of specialist requirements. He has been heavily involved in both the conceptual design and delivery of many iconic buildings and his expertise covers construction management, pre-construction engineering, and construction audit. He leads a team of 100 professionals engaged in the construction engineering and management.

Kartick's approach to the construction of buildings and other structures is very 'hands on', clients appreciate his insight and passion for delivering innovative structural solutions and exceptional leadership skills. He believes that building engineering should be a people focused, technically driven community that mixes communication, a clear understanding of building physics and creative thinking together to provide high levels of excellence.

Email Kartick at kartick@4Kengineering.com

Khaled, an electrical engineering graduate from BUET, brings considerable international business experience at 4K through his executive career with Siemens, Nokia Siemens Networks and Banglalion where he held progressively senior leadership roles in technology management, finance, operations and general management.

Over a 20 year career Khaled's willingness to involve himself and collaborate during each project phase from conceptual design to execution has continually aided his teams in achieving the highest levels of sustainability through consistently innovative solutions tailored to each project's unique challenges. Khaled's passion for taking a multidisciplinary approach to work, believing in the value that can be obtained through the collaboration and interaction between individual skills and disciplines has proved popular with clients, who realize the many benefits this brings to their projects. Fundamental to his success is his grasp of cross-disciplinary skills. He understands the value of applying a breadth of knowledge to a challenge in order to find its most ideal solution

Khaled having a degree in MBA from IBA, Dhaka University is Adjunct faculty in MBA Program at BRAC University and University of Liberal Arts.

A particular interest is the use of internet in nation building has led to Khaled becoming President of Center for Internet and Society in Bangladesh.

1.5 Report layout

Now I talk about the goal of internship, Motivation of internship and introduction to the Company in my document paper. I have portrayed the method of my internship. About the company, goal group, organizational structure. In this report, written about daily through tasks. This report, I have written about the Completion and Future opportunities. Additionally talk about the Future opportunities of records technological know-how or network administration. I talk about the conclusion and future profession in records technology. In the last pages have all the references and appendices now I am adding.

CHAPTER 2 ORGANIZATION

2.1 About the Company

A company founded and run by engineers, 4K got a vision that is grounded in reality but also soars to the sky. For any need, we find the best suitable solution, and offer it to our clients at a competitive price. Our solutions have the lowest total cost of ownership and our quality exemplifies our commitment to excellence.

4K strives to excel in Telecom, Power, Automation, Construction management, Safety and Security arena to ensure optimum values for its clients and society. 4K's leadership focused for effective engagement in creating intelligent solution for its clients. 4K generates revenue from telecom network build and maintenance, design and builds fire detection and protection solution, design and builds power solution, structural audit services and supply of telecom and IT solutions.

Our principals have over 50 years combined, global experience running and managing complex enterprises in the field of electrical, civil construction, telecommunication, SW automation, project management, Toy manufacturing and in customer engagement.

2.2 Product and Market Situation

4K works with world renowned companies like LONIX, CHECKPOINT, MOBOTIX, ISONUS Security Systems, MUSGRAVE generators, MOBOTIX, EMICON precision AC, GTEK, C&D Technologies, GE Solar, Blue Star Air Conditioning, FALCON UPS and more. We are involved in a wide spectrum of activities including Industrial Contracting, Trading & Service whether Industrial or Commercial.

4K addresses Projects with its engineering capabilities and project execution skills, provide a wide range of Electro-Mechanical Contracting services including: -

BTS /Node B/RNC/MW/IBS installation and Commissioning and Maintenance. Supply and Installation of Telecom Installation materials. Electrical Solution Contracting services on turnkey basis. Mechanical contracting services design, supply, install, commissioning of HVAC, Plumbing. IT Security Solutions, Customer Engagement Solutions, Data Analytics, Network Optimization. Structure, Electrical and Fire Audit for Industries Etc.

4K has the technical expertise, connected with trained & experienced project personnel, have access to skilled manpower, tools, equipment and logistics support through its association.

2.3 Target Group

4k engineering work on building Power, Automation, Safety and Security areas. We focused to improve people safety and comfort through our innovative solutions. We represent some of the world's finest engineering, design and program management companies - with long decades of experience in their respective fields.

Our purpose is "To create, enhance and sustain the world's built natural and social environments. " Dedicated to this promise, our company is driven by a clear set of Core Values, which define who we are, what we do and how we do it.

2.4 SWOT Analysis

SWOT evaluation is a strategic planning method that helps a character or organization become aware of the strengths, weaknesses, opportunities, and threats associated with the business competition or action planning.

• Strength:

- Communication between individual people through distance (at home and at work).
- We are honest and ethical in our actions.
- We keep our commitments and treat others with mutual respect and trust.
- Weaknesses:
- No weakness but have some Improvement Creativity, exploration and imagination are key to our business approach. We continually look for creative, new or better ways to apply our expertise to all dimensions of our work.

• **Opportunities:**

- The age structure of the population is changing.
- Modification of the regulatory framework.
- We respect and encourage our employees' ideas, diversity and cultures.

• Threats:

• No threats all system are great..

2.5 Organizational Structure

Table 2.1:Employee Hierarchy of 4K Engineering

Chairman
Managing Director
General Manager
Manager
Deputy Manager
Assistance Manager
Project Engineer
Senior Officer
Officer
Officer Staff

CHAPTER 3

TASKS, EVENTS AND ACTIVITIES

3.1 Daily Tasks and Activities

Month – **1:** I learned the first month of internship at 4K Engineering Limited and practiced the following:

- Introduction of Network IP address.
- Understand the basic idea of a router.
- Routing configuration and how the router works.
- Trying to know about Mikro-Tik router.
- About know different types of router.
- About Static routing configuration.
- About Dynamic routing configuration.

Month – 2: When I have completed a one-month internship learned and performed this thing:

- learn about PPPoE configuration.
- learning about NTP configure
- Learning and understanding Local ISP configuration.
- know about Bridge mood configure
- Introduction of WI-FI configure.
- Trying to know about essential two routing.

Month – 3: 4K Engineering Limited third month internship, learned and performed this tasks:

- Know about Cisco switch & router configuration.
- Learning about Network cabling system.
- Know about IPV6 fundamental and configuration.
- Know about cambium networks.

Month – **4:** Last month of the Internship at 4K Engineering Limited I learned and performed the following tasks:

- Introduction of Linux addition two & Installation.
- Know about Linux system administration.
- Describe of FTP, NFS, WEB, Samba, DHC, DNS server.
- Learn about Syslog server.
- Know about Securing with IP tables.
- Introduction of NIS configuration.
- Learn RAID, LVM, Boot and Grub level.
- Learn about mounting and RPM.
- Know about Modify the partition.

3.2 Events and Activities

- Monitor Computer Systems and Network.
- Set up user accounts, and passwords.
- Correction servers and routers.
- Correction of local area networks and switches.
- Fixing network faults.
- Technical support for people using the network.
- Cell phone or physical client support ends the customer.
- Monitor daily admin and network usage fixing network faults.

3.3 Project Task and Activities

Networks:

A Network mixture of computers, servers machine many different peripherals two machine which is related every different to sharing the facts or records and so on.

Networks are five types:

- 1. Local area community (LAN)
- 2. Metropolitan area network (MAN)
- 3. Wide area network (WAN)
- 4. Wireless
- 5. Inter network (internet)

ISP: An web service issuer (ISP) is a machine that presents many sorts of net get entry to use or assistance provider .Internet provider vendors canbe organized in distinct types such as commercial, community owned, nonprofit, or in any other case personal ownership.

Different types of ISP connections

- Dial-up.
- Digital subscriber line (DSL).
- Cable broadband.
- Fiber optic broadband.
- Wi-Fi broadband.
- Satellite and mobile broadband.
- Dedicated leased line.

Mikro-Tik Routers That's the hardware router board OS. It can be mounted on a computer two with all fundamental feathers two to route firewall, IP address gateway DNS server, PPPoE server etc.

Router: A router is a network gadget which is forward records to computer. Router operate the traffic directing characteristic on the internet.

Wi-Fi: Wi-Fi is the wireless network technological know-how which makes use of radio waves to function high speed net and network connection.

IP Address: IP tackle which is web protocol address. Network use the IP tackle which is assign on protocol to talk and assist to records passing.

Function: IP address has two function that name host and another is network.

3.4 Mikro-Tik Router

Mikro-Tik hardware which is basically use for router. In any employer take bandwidth in primary router than it given by way of different Mikro-Tik router. It's the usage of in LAN, swap hotspot and many others for the user to data sharing.

Mikro-Tik Router Rb2011UiAS:

Mikro-Tik Router Rb2011UiAS has most feathers and interface from all our wireless router .It has 600MHz 70K community processor.128mb RAM, SFP cage, 5 GB LAN ports and Ethernet ports. 2,4Ghz 802.11 wireless.RJ45 serial ports and micro USB port. Figure (3.1) [2];



Figure:3.1: Image of Rb2011UiASMikrotik Router.

3.5 Router OS

The Mikro-Tik is an OS which is used for router. Any employers use it for router because of its price reachable It at the identical time connect 10 laptop in one IP address. It can additionally using bridge, firewall, DHCP additionally the use of hotspot. It join with swap, data passing to purchaser very smoothly.

3.6 Feathers

Router OS helps many functions used through Internet Service Providers. For example:

- It uses a bridge or swing
- It provides PPPoE client-server.
- It creates firewall rules.
- It provides a DHCP server service.
- It provides easy administration.
- It is very easy to manage bandwidth.
- It Easy GUI interface.

3.7 How to be a Mikro -Tik Configuration:

Mikro-Tik use three layer which is bodily layer, data link layer, network layer. when Mikro-Tik install than we use win box to set up IP tackle ,gateway, DNS, NAT, bridge, Firewall and many others .Here are three types of routing there is static, DHCP, PPPoE. Mikro-Tik router the usage of quick and easy GUI in Figure (3.2) [2]

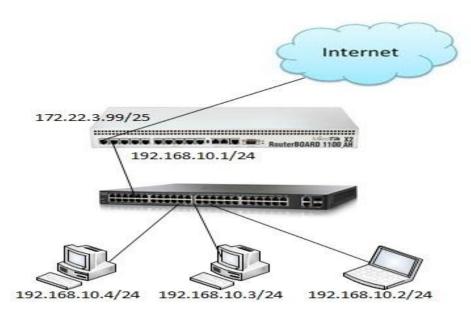


Figure. 3.2: How to works Mikro-Tik

3.8 Mikro-Tik Router Configuration:

Mikro-Tik Router OS is installed then windows Software is installed. The PC with windows running device hooked up and RJ45 cables. Then rest, Mikro-Tik router Click Mac address write "Admin" the login field don't need to provide the password. Figure (3.3) [4].

Step 1: Ping>system reset-configuration>Enter.

Terminal					
MMM MMM	KKK		TTTTTTTTTTT	KKK	
MMMM MMMM	KKK		TTTTTTTTTTT	KKK	
MMM MMMM MMM	III KKK KKK RRRRR	000000	TTT	III KKK	KKK
MMM MM MMM	III KKKKK RRR R	RR 000 000	TTT	III KKK	KK .
MMM MMM	III KKK KKK RRRRRR	000 000	TTT	III KKK	KKK
MMM MMM	III KKK KKK RRR R	RR 000000	TTT	III KKK	KKK
MikroTik Rout	erOS 6.43 (c) 1999-201	8 http	://www.mikro	tik.c <mark>o</mark> m/	
[2]	Gives the list of ava	ilable comman	nds		
command [?]	Gives help on the com	mand and list	t of argumen	ts	
[Tab]	Completes the command a second [Tab] gives			mbiguous,	Ĩ
1	Move up to base level				
••	Move up one level				
/command	Use command at the ba	se level			
DEVICE HACKED -	ACCOUNT admin HAD UNS	AFE PASSWORD			
[admin@MikroTik] > system res				
resource reset	-configuration				
[admin@MikroTik] > system reset-confi	guration			

Figure.3.3: Screenshot Reset Mikro-Tik Router.

Add interface LAN & WAN .choose IP to define the LAN & WAN in Fig (3.4)

[7]

*Step 2:*IP>add IP apply>ok

Define IP Setting up process. Process: IP click on + IP address + (plus signalclick)

+ add IP + practice ok.

Name: ether1 WAN Type: Ethemet Actual MTU: 1500 Actual MTU: 1500 L2 MTU: 1598 Max L2 MTU: 4074 MAC Address: D4:CA:6D:D8:26:F9 ARP: enabled ARP Timeout: Image: Counters	General	Ethemet	Loop F	Protect	Overall S	stats	Rx Stats		ок
MTU: 1500 Actual MTU: 1500 L2 MTU: 1598 Max L2 MTU: 4074 MAC Address: D4:CA:6D:D8:26:F9 ARP: enabled ARP Timeout: ARP Timeout: MAC Address			Name:	ether 1	WAN				Cancel
Actual MTU: 1500 Disable L2 MTU: 1598 Comment Max L2 MTU: 4074 Torch MAC Address: D4:CA:6D:D8:26:F9 Cable Test ARP: enabled Blink ARP Timeout: Torch Reset MAC Address			Type:	Ethem	let				Apply
L2 MTU: 1598 Comment Max L2 MTU: 4074 MAC Address: D4:CA:6D:D8:26:F9 ARP: enabled ARP Timeout: Cable Test Blink Reset MAC Address			-						
Max L2 MTU: 4074 MAC Address: D4:CA:6D:D8:26:F9 ARP: enabled ARP Timeout: The set MAC Address								_	Comment
ARP: enabled ARP Timeout: AR		Max L	2 MTU:	4074					Torch
ARP: [enabled] ARP Timeout: Reset MAC Address		MAC A	ddress:	D4:CA		5:F9			Cable Test
ARP Timeout:			enabled					Blink	
Reset Counters		ſ				1-	Reset MAC Address		
									Reset Counters

Figure. 3.4: Screenshot interface Setting.

IP address chooses category B for LAN and WAN address choose which is outline easily. Figure (3.5)

Step 3: Define the process of setting up IP. Process: IP + IP Address + Click (plus sign click) +

IP + Practice OK. N.B. First select WAN port and LAN port but WAN will provide IP add,

gateway and subnet mask due to WAN. IP Address Format 0.0.0.0/0 (default route).

IP>address add> address select>interface> apply>ok

Address:	172.16.1.1/24		ок
Network:	172.16.1.0	-	Cancel
Interface:	ether5 LAN	₹	Apply
			Disable
			Comment
			Сору
			Remove

Figure. 3.5: Screenshot IP address set up LAN & WAN.

PC IP eliminates and pick IP address, gateway, DNS server, and many others. And then study to IP address. Figure (3.6) [5]

Step 4:IP>DNS IP>apply>ok

Status	Vetwork and Shari $\leftarrow \rightarrow \checkmark \uparrow$	ng Center ≪ Net >	Network		→ ○ ×		- • ×	
other PCs on your network. Network troubleshooter Diagnose and fix network prot	Control Panel Hon Change adapter se Change advanced	tings	$\leftarrow \rightarrow \lor$ Organize \checkmark	↑		:h N	Network Connections	
View your network properties	Change advanced settings	naring	-			lenti	t tified network PCIe FE Family Con	
Windows Firewall		Ethernet	Status	6	Ethernet Properties	Г	Internet Protocol Version 4 (TCP/IPv4) Properties	×
Network and Sharing Center		General			Networking Sharing		General	
Network reset			nnectivity:		Connect using:		You can get IP settings assigned automatically if your network su this capability. Otherwise, you need to ask your network adminis for the appropriate IP settings.	
Have a question? Get help		Media S Duratio Speed: Deta	tate:		Config This connection uses the following items:	lure	Obtain an IP address automatically 	
Make Windows better	See also HomeGroup Infrared	Activity —	Sent	_			Default gateway: Obtain DNS server address automatically (************************************	i
Manual New WinBox Exit	Intrared Internet Options Windows Defender	Bytes:	1,32	2	Install Uninstall Proper Description Transmission Control Protocol/Internet Protocol. The der	faut	Preferred DNS server: 203 . 190 . 10 . 252 Alternate DNS server: 203 . 190 . 10 . 253]
		Prope	rties 💎 Dis	Si	wide area network protocol that provides communication across diverse interconnected networks.	1	Validate settings upon exit Activate	o activate, Windows
			_	ι.	ок	Ca	OK	Cancel

Figure. 3.6: Screenshot DNS set up.

Firewall first putting is NAT setup than two boosts replicate pre-routing and a pick out motion to masquerade in Figure (3.7)

*Step 5:*IP>firewall>NAT>action>masquerade>apply>ok

Advanced Extra Action Statistics	ОК
Action: masquerade	Cancel
وما 🗌	Apply
Log Prefix:	Disable
To Ports:	, Comment
	Сору
	Remove
	Reset Counters
	Reset All Counters

Figure. 3.7: Screenshot Firewall NAT.

Next, the gateway set up the process is assigned Figure. (3.8)

Step 6: IP>route>gateway IP>apply>ok

C* Safe Mod	le Session: 172.16.1.1		
Quick Set			_
CAPsMAN			
Interfaces			
Wireless			
Bridge			
PPP			
≘ Switch			
8 Mesh		Frewal 🗖 🗙	
IP	4	Filter Rules NAT Mangle Raw Service Ports Connections Address Lists Layer7 Protocols	
MPLS	1	+ - V X 🖾 🍸 oo Reset Counters oo Reset Al Counters Find al V	
Routing	1	# Action Chain Src. Address Dat. Port Dat. Port In. Inter Out. Int Bytes Packets	
System	1	0 X drop forward 1156 B 19	
Queues		1 vacc forward 172.16.1.254 1667.6 KB 9 139 2 xdrop forward 172.16.1.0/ 41.8 KB 174	
Files		2 Allo Polinard 172.10.10/ 41.0 ND 174	
Log			
Radius			
Tools	Þ		
New Terminal			
LCD			
MetaROUTER	8		
Partition			
Make Supout r	nf	3 items (1 selected)	
Manual		annia (ranaan)	
New WinBox			
Exit			

Figure. 3.8: Screenshot Gateway IP Assign.

Now create a bridge which connects two or many different laptops in completely one The IP address which without difficulty shares facts passing in the samenetwork. Figure (3.9) [9];

Step 7: Process: Bridge>Ports> "+" > (bridge n, here n=1,2,3....)> Apply>ok

DHCP Server DHCP Networks Leases Options Option Sets Alerts + -7 DHCP Config DHCP Setup Find Name Relay Add AR. / Interface Lease Time Address Pool • 00:10:00 dhcp_pool1 dhcp1 bridge1 no

IP > DHCP Server > DHCP Setup > bridge 1> following Next Option.



Create ports to show the two bridge.Figure (3.10) [12]

*Step 8:*Bridge>ports>add>ip adress >apply>ok

Bridge	Ports	VLANs	MSTIs	Port MST On	ventides Filt	ers NAT	Hosts MI	DB			
+ =	•		- 7	·							
#	Inter	face	Br	idge	Horizor	Trusted	Priority (h	Path Cost	Role	Root Pat	
0 H	11e	ther5 LAN	l bri	dge1		yes	80	10	designated port		
1 IH	110	ther6	bri	dge1		yes	80		disabled port		

Figure. 3.10: Screenshot Create Two Bridge

Define Mangle Option to assist queue to select provide address & vacations pot address. Figure

(3.11) [10]

Step 9:IP > Firewall > Mangle> Files >Address.rsc>> New Terminal > Import

Address.rsc

New Mangle Rule	
General Advanced Extra Action Statistics	ок
Action: mark connection	Cancel
🗌 Log	Apply
Log Prefix:	Disable
New Connection Mark: youtube	Comment
✓ Passthrough	Сору
	Remove
	Reset Counters
	Reset All Counters

Figure. 3.11: Screenshot set up mangle option.

To set up the net browser, rate, classifier & limit for how tons to use the data to pick out this one by way of one. Fig (3.12)

Step 10: Process IP > Firewall > Address list> Mangle>" + " > Action > Mask connection > New connection Mask Name (YouTube) > Advance > select the YouTube-IP > Apply > ok

General > Connection mask > YouTube> Apply > ok

Action > Mask Packet > YouTube > Apply > ok

Queues > Queue Types > " + " > Type Name (Download) > kind > PCQ > Select rate >

Apply > ok

Queues > Queue Types > " + " > Type Name (Upload) > kind > PCQ > Select rate >

Select the Classifier src. Address> Apply > ok

New Queue Type			
Type Name:	upload		ОК
Kind:	pcq	₹	Cancel
Rate:	5M	bits/s	Apply
Limit:	50	KiB	Сору
Total Limit:	2000 KiB		Remove
Burst Threshold: Burst Time:	00:00:10		
	Src. Address Dst. A	0.000	
	Src. Port Dst. P	ort	
Src. Address Mask:			
Dst. Address Mask:	32		
Src. Address6 Mask:	64		
Dst. Address6 Mask:	64		

Figure. 3.12: Screenshot Queue Settings

Here we show how a lot Mbps are makes use of on YouTube browser .Figure (3.13) *Step 11:* Define Upload and Download Rate

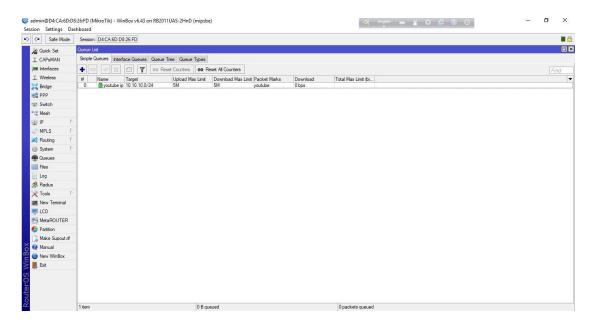


Figure 3.13: Screenshot Upload & Download rate

3.9 PPPoE

PPPoE full that capability is a thing to point protocol over Ethernet. It is an antithetic profile. It is used on the whole DSL provider the place a person is the usage of free two in over to Ethernet.

3.10: PPPoE Configuration

First, we will configure the interface that is linked to WAN. Than laptop computer, IP address deletes & choose which we pick for PPPoE. Figure (3.14) [4]

Step 1: Queue>address >queue type>apply >ok

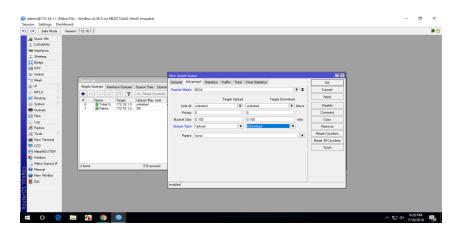


Figure. 3.14: Screenshot PPPoE WAN set up.

Now one interface is configured and linked to WAN. Now we will configure the 2nd interface for our nearby community in Figure (3.15)

C* Safe Mode	Session: 172.16.1.1											
Quick Set												
CAPSMAN												
Minterfaces												
Bridge												
PPP												
≓ Switch												
	PPP											
alla ⊳	Interface PPPoE Servers Secrets	Profiles Activ	e Connections L2	TP Secrets								
Ø MPLS ►	+ < x @ 7	PPP Scanner	PPTP Server	SSTP Server	L2TP Server	OVPN Server	PPPoE Scan					Find
🕏 Routing 💦 🗅	PPP Server		tual MTU L2 MTU		Rx		Tx Packet (p/s)	Rx Packet (p/s)	FP Tx	FP Rx	FP Tx Packet (p/s)	
🖟 System 🗈	PPP Client											
Queues	PPTP Server Binding											
Files	PPTP Client											
Log	SSTP Server Binding											
🔒 Radius	SSTP Client											
🕻 Tools 🗈 🏱	L2TP Server Binding											
New Terminal	L2TP Client											
LCD	OVPN Server Binding											
MetaROUTER Partition	OVPN Client											
Make Supout if	PPPoE Server Binding											
Marual	PPPoE Client											
New WinBox												
Exit												
B 0												

Figure. 3.15: Screen shot PPPoE server Binding.

Now we will create a profile that will be used via specific users. Go to the predominant PPP window, go to Profiles tab, right here you will see two profiles through capability of default, don't do Something to these default profiles, create a new profile through capability of pressing the PLUS sign. Figure (3.16)

Step 3: FTP>name>local address >apply >ok

C≇ Safe Mode	Session: 172.16.1.1		
Aulok Set			
CAPsMAN			
www.interfaces			
T Wireless			
3 Gridge		New PPP Profile	
eta PPP		General Protocols Limits Queue Scripts OK	
Switch		Name: IM Cancel	(
*CS Mesh	PPP	Local Address: 192.168.1.1 T A Apply	
∰ IP ト ⊘ MPLS ト	Interface PPPoE Servers Secrets Profiles Active Connections L2TP Secrets		
Routing		Comment	
System	Name / Local Address Remote Address Bridge Rate Limit Only C	ne Bridge: Copy	
Queues	* 😚 default-encr defaul		
Files		Bridge Path Cost:	
Log			
A Radius		Incoming Fiter:	
🗶 Tools 🔹 🗅		Outgoing Fiter:	
New Terminal		Address List:	
💭 LCD			
MetaROUTER		DNS Server:	
Partition		WINS Server:	
] Make Supout.nf	2 items	C no C yes C default	
😯 Manual	a desirie		
New WinBox		C no C yes @ default	
📕 Ext			
		Activate	

Figure. 3.16: Screenshot profile create.

My PPPoE Server Setup is complete, however, the Internet proper now will not be working at any client. Now we will set up NAT and ROUTE and DNS so that the net will also work on the clients. Figure (3.17)

*Step 4:*IP > Firewall. >NAT > add >FIREWALL rule> chain=srcnat ,src.address= () >action=masquerade> Apply>OK.

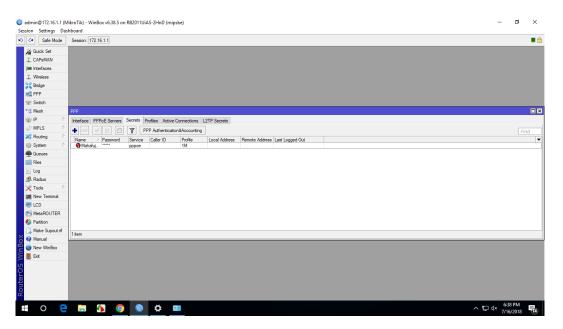


Figure. 3.17: Screenshot PPP secrets to Password.

Now the last step DNS server on Mikro-Tik router and supply by way of my ISP. Now our PPPoE server setup with profile and the whole thing will work. Figure (3.18) *Step 5:*IP > DNS> settings > primary and secondary DNS Server's IP >apply >ok.

	metered cor 🚆 Network and Sharing Center - 🗆 🗙	
Find a setting	Chapter and the Martin A Structure and the	
Network & Internet	- C X	
Status	Cha Type the information from your Internet service provider (ISP)	
Ethernet	User name: məhafuj	
🕾 Dial-up	Pesseerd: Pesseerd:	
% VPN		
🕑 Data usage	ag	
Proxy	Of More project to use this connection This option allows anyone with access to this computer to use this connection. Litera Litera an Set	
	View Wind Connect Cancel	
	Network any Internet Options	
		rate Windows Settings to activate Windows.

Figure. 3.18: Screenshot Connect PPPoE.

3.11 Cambium Device: Cambium networks deliver strong, high conduct, on hand Wi-Fi broadband additionally restoration statistics and resident get entry to the application. [3];

3.12 Types of Cambium networks configuration:

- AP mode
- Routing mode

AP mode:AP mode define that I have no choice to IP address. Name and password only alternate this mode. IP tackle gives in AP mode which is given in Mikro-Tik.

Routing Mode: Routing mode defines that I have a desire to IP tackle and additionally exchange title and password.

3.13 How to configuration Cambium Networks in two types:

AP: Go to putting and alternate the IP address & subnet masks than we ping the IP Address. Figure(3.19)

Step 1: Default IP >User name > password >ok

General	
	d automatically if your network supports need to ask your network administrator
Obtain an IP address auto	omatically
• Use the following IP addre	ess:
IP address:	192.168.0.2
Subnet mask:	255 . 255 . 255 . 0
Default gateway:	
Obtain DNS server addres	
Preferred DNS server:	X X (37)
Alternate DNS server:	
	at Advanced

Figure. 3.19: Screenshot IP address set up

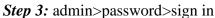
When ping IP address profitable than the ap route is configured in cambium networks. Figure (3.20)

Step 2: Browser>pc IP>ok than ping network address >successful

C:\Windows\system32\cmd.exe
Microsoft Windows [Version 10.0.16299.251] (c) 2017 Microsoft Corporation. All rights reserved.
C:\Users\DOL>ping 192.168.0.1
Pinging 192.168.0.1 with 32 bytes of data: Reply from 192.168.0.1: bytes=32 time<1ms TTL=64 Reply from 192.168.0.1: bytes=32 time<1ms TTL=64 Reply from 192.168.0.1: bytes=32 time<1ms TTL=64 Reply from 192.168.0.1: bytes=32 time<1ms TTL=64
Ping statistics for 192.168.0.1: Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds: Minimum = Oms, Maximum = Oms, Average = Oms

Figure. 3.20: Screenshot ping Network address.

Cambium network login page we log in by using admin and password and then sign in Figure (3.21)



• cnPilat E400 - E400-048D68 ×	+	
→ C û ▲ Not secure	192.168.0.1/#/	
Cambium Networks" CnF	'ilot E400 - E400-048D68	
		Login
		admin
		admin admin
		A
		Sign In

Figure. 3.21: Screenshot log in page

Define how lots customer and channel connect. And rate, limit additionally see this page. Figure (3.22)

Step 4: Proces	s: sign in $>$ ok
----------------	-------------------

 (enPilot E400 - E400-048D68 × (cnPilot E400 - E400-048D68 × (cnPilot E400 - E400 - 048D68 × 	+ 192.168.0.1/#/home-view				or ☆ @
	2 192.166.0.1/#/nome-view				w x c
Cambium Networks	cnPilot E400 - E400-048D68	3			Ċ Reboot 🕞 Log
III Dashboard	Please configur	e the Country of operation under Configure->Syste	m		
孢 Monitor 👻	Home / Dashboard				Refresh 30sec -
🌣 Configure 🗸	Clients 0	Channel auto 2.4GHz auto 5GHz	Ethernet 100M ETH1		Quality 2.4GHz 5GHz
	Access Point Info		Radio Info		
🗲 Troubleshoot 🗸	MAC Address	58-C1-7A-04-8D-68	Туре	2.4GHz	5GHz
	Model	cnPilot E400	WLANS	0	0
	Software Version	3.9-r3	Clients	0	0
	Location		Channel	auto	auto
	Hostname	E400-048D68	Channel Width	20MHz	80MHz
	Uptime	0 days, 0 hours 3 minutes	Power	0	0
	Available Memory	62 %	MAC Address	58-C1-7A-04-82-90	58-C1-7A-04-66-70
	CPU Utilization	10 %	Transmitted packets	0 pkts/sec	0 pkts/sec
	Hardware Type	Dual Band Indoor Integrated	Received Packets	0 pkts/sec	0 pkts/sec

Figure. 3.22: Screenshot dashboard Cambium networks

Go to system to edit name password. Figure (3.23)

*Step 5:*Name>placement >indoor>password>save.

	re 192.168.0.1/#/home-view/configure-system		\$
	where the AP is installed.		
🖀 Monitor 👻	Configure / System		
🗘 Configure 🖌	System		
🖵 System	Name	sadika	Hostname of the device (max 64 charactera)
f Radio	Location		Location where this device is placed (max 64 characters)
♥ WLAN	Contact		Contact information for the device (max 64 characters)
A Network	Country-Code Placement	Other Other Other Other Other Other Other	For appropriate regulatory configuration
Services	LED	Whether the device LEDs should be ON during of	
후 Operations	LLDP	Whether the AP should transmit LLDP packets	
F Troubleshoot -	Management		
	Admin Password		Configure password for authentication of GUI and CLI sessions
	Autopilot	Default	Autopilot Management of APs
	Teinet	Enable Telnet access to the device CLI	

Figure. 3.23: Screenshot system configure

VLAN set up in static than set up IP address DNS server then save. Figure (3.24) *Step 6:* Network >Static IP>Network mask>DNS server 1 >save

System	VLAN				
* Radio	Edit VLAN 1 🔻	Delete this interface			Add new L3 Interface
	IP Address	O DHCP			
P WLAN		Static IP 10.10.24	Network Mask 255.255.255.		
Network	100 million (100 m			0	
	NAT	When NAT is enabled, IP addresses	s under this SVI are hidden		
Services	Zeroconf IP	Support 169.254 x x local IP addres	8		
Operations	Management Access	Allow from both Wired & Wireless	•	CL/GU/SNMP access via this interface	
operations	DHCP Relay Agent	2005/2005/2005/2005		Enables relay agent and assign DHCP server to it	
Troubleshoot -	DHCP Option 82 Circuit ID	None	¥		
	DHCP Option 82 Remote ID	None	×		
	Request Option All	 Use Gateway, DNS, Dhop options n 	aceived on this interface		
	Routing & DNS				
	Default Gateway	10.10.10.1		IP address of default gateway	
	Domain Name			Domain name	
	DNS Server 1	203.190.10.252		Primary Domain Name Server	
	2	203.190.10.253		Secondary Domain Name Server	
	DNS Proxy	DNS Proxy			

Figure. 3.24: Screenshot VLAN set up

Basic set up in AP route mode two SSID & passphrase set than Ap mode is full set up than we can browse on the internet. Figure (3.25)

Step 7: Basic >SSID>Passphrase>save .

	secure 10.10.10.24/#/home-view/configure-wlan		প ও
Configure -	Add WLAN		
🖵 System	wlan 1 [No \$SID]		
* Radio			
🕏 WLAN	Basic Radius Server Guest Access Usage Limit	ts Scheduled Access Access Passpoint	
A Network	Basic		
Services	Enable	*	
≢ Operations	Mesh	Off	Mesh Base/Dient/Recovery mode
	SSID	sadika	The SSID of this WLAN (upto 32 characters)
Froubleshoot -	VLAN	1	Default VLAN assigned to clients on this WLAN. (1-4094)
	Security	WPA2 Pre-shared Keys	Set Authentication and encryption type
	Passphrase		WPA2 Pre-shared Security passphrase or key
	Radios	2.4GHz and 5GHz	Define radio types (2.4GHz, 5GHz) on which this WLAN should be supported
	VLAN Pooling	Disable v	Configure VLAN pooling
	Max Clients	127	Default maximum Client assigned to this WLAN. (1-256)
	Client Isolation	Disable	When selected, it allows wireless clients connected to the same AP or different APs to communicate with each other in the same VLAN
	cnMaestro Managed Roaming	Enable centralized management of roaming for wireless clients through	h cn/Maestro
	Hide SSID	Do not broadcast SSID in beacons	
	Session Timeout	28600	Session time in seconds (60 to 604800)
	Inactivity Timeout	1800	Inactivity time in seconds (60 to 28800)

Figure. 3.25 : Screenshot edit WLAN

Routing mode :

Routing mode is now configured to set VLAN, static IP, gateway, DNS server. Figure (3.26)

*Step 1:*Process : Network> VLAN >Edit > VLAN 100>static ip > network ip >default gateway >DNS server 1> DNS sever 2>save

🖹 Monitor 🖌	Configure / Network		
Configure -	VLAN Routes Ethermet Ports Security DHCP	Tunnel PPPoE VLAN Pool	
⊋ System	VLAN		
• Radio	Edit VLAN 100 V	Delete this interface	Add new L3 Interface
🕈 WLAN	IP Address	© DHCP ® Static IP Network Mask	
A Network	NAT	192.168.0.1 255.255.256.0 W When IVAT is enabled. //P addresses under this SVI are hidden	
Services	Management Access	Allow from both Wired & Wireless	CLUGU/SMMP access via this interface
E Operations	DHCP Relay Agent	0.0.0.0	Enables relay agent and assign DHCP server to it
2 Operations	DHCP Option 82 Circuit ID	None ¥	
🗲 Troubleshoot -	DHCP Option 82 Remote ID	None 🔻	
	Request Option All	Use Gateway, DNS, Dhop options received on this interface	
	Routing & DNS		
	Default Gateway	10.10.10.1	IP address of default gateway
	Domain Name		Domain name
	DNS Server 1	203.190.10.262	Primary Domain Name Server
	2	203.190.10.263	Secondary Domain Name Server
		DNS Proxy	

Figure 3.26: Screenshot routing mode configure.

Network icon to set up DHCP, Address range what is a restriction to shopping and DNS server. Figure (3.27)

Step 2: Network> DHCP >edit> pool 1>Address range > default router >DNS address >network >clint >network >save

Dasnboard								Success	×			
Monitor -	Configur	e / Network						pool 1 Config	aration Saved			
Configure -	VLAN	Routes	Ethernet Ports	Security	DHCP	Tunnel	PPPoE	VLAN Pool				
System		Edit	pool 1		•	Delete	this Pool					Create P
ladio				Add	ress Range	192.1	58.0.2		192.168.0.254	IP address range to be assigned to	clients	
WLAN				Def	ault Router	192.1	58.0.1		Default router iP			
letwork				Dor	main Name				Domain Name			
				DN	IS Address	203.1	90.10.252		203.190.10.253	Domain name for the client		
ervices					Network	192.1	58.0.0		255.255.255.0	Subnet number and mask of the DF	ICP address pool	
perations					Lease	1			Hours	Minutes	Lease time (days hours minutes)	

Figure 3.27: Screenshot DHCP set up

Here WLAN just edits to identify and passphrase. And configure full routing mode. now browse smoothly. Figure (3.28)

Step 3: Process: WLAN > name > passphrese > save

	Not secure 10.10.10.24/#/home-view/configure-wl		o r Q ☆
Configure -	Ard WLAN	Success X Bacic Configuration Saved	
⊋ System	sadika		
Radio			
WLAN	Basio Radius Server Guest Access Usage Limits Se	cheduled Access Access Passpoint	
Network	Basic		
Services	Enable	×	
Operations	Mesh	Off 🛛 🔻	Mesh Base/Client/Recovery mode
	\$ SID	sadika	The SSID of this WLAN (upto 32 characters)
Froubleshoot +	VLAN	100	Default VLAN assigned to clients on this WLAN. (1-4094)
	Security	WPA2 Pre-shared Keys	Set Authentication and encryption type
	Passphrase		WPA2 Pre-shared Security passphrase or key
	Radios	2.4GHz and 6GHz	Define radio types (2.4GHz, SGHz) on which this WLAN should be supported
	VLAN Pooling	Disable	Configure VLAN pooling
	Max Clients	127	Default maximum Client assigned to this WLAN (1-256)
	Client Isolation	Disable 💌	When selected, it allows wireless clients connected to the same AP or different APs to communicate with ea other in the same VLAN
	onMaestro Managed Roaming	Enable centralized management of roaming for wireless olients through onl/sestro	
	Hide \$SID	Do not broadcast SSID in beacons	
	Session Timeout	28800	Session time in seconds (60 to 604800)
	Inactivity Timeout	1800	Inactivity time in seconds (60 to 28800)
	Drop Multicast Traffic	Drop the send/heceive of multicet treffic	

Figure. 3.28: Screenshot WLAN set up

3.14 Cisco Switch

A community change is a laptop network device that connects a system to a computer network by means of the usage of packet switching to receive, system and forward data to the gadget of a destination. To configure a swap we have to be aware of three basic modes. These modes additionally are the equal for the Router. [3];

There is a total of five modes:

- 1. User Execution Switch>
- 2. Privilege> Switch#
- 3. Global configuration >Switch(config)#
- 4. Interface> Switch(config-if)#
- 5. Sub-interface >Switch(config-subif)#

3.15 Linux:

Just like Windows XP, Windows 7, Windows 8, and Mac OS X, Linux is a working system. A working system is a software that manages all of the hardware sources associated with our computer or laptop. [8];

The OS is comprised of a number of pieces:

- The Boot loader.
- The kernel

- Daemons.
- The Shell
- Graphical Server
- Desktop Environment
- Applications.

Many benefits of Linux :

- The freedom to run the program, for any purpose.
- The freedom to study how the software works, and alternate it to make it do what wish.
- The freedom to redistribute copies so I can assist my neighbor.
- The freedom to distribute copies of my modified versions to others.

3.16 Installing Linux:

Download the Linux iso(desktop not server) and the free VMware Player.

Install VMware Player and run it, Select "Create a New Virtual Machine "Select "Installer disc photo file" and browse to the Linux iso I downloaded. Here we take two sorts of installation. We can take any different however I take usually because it's convenient to laptop in as I prefer. Then next, Figure (3.29)

Step 1: Select typical>next



Figure. 3.29: Screenshot Complete the VM virtual box installation.

Here three sorts of systems however I wager that's why I without difficulty use to OS, I will installation the OS later. Than Next. Figure (3.30)

Step 2: Select > I will install the OS later >next

lew Virtual Machine Wiz	ard			2
Guest Operating Sy	stem Installation			
	is like a physical com you <mark>install the guest</mark>			erating
Install from:				
O Installer disc:				
No drives availa	ble		~	
O Installer disc image f	île (iso):			
	île (iso): i4 xi\CentOS-6,4-x8(6_64-bin-	DVD1 🗸	Browse
		6_64-bin-	DVD1 ~	Browse
		6_64-bin-	-DVD1 ~	Browse
	4 xi\CentOS-6.4-x8	6_64-bin-	DVD1 ~	Browse
D:\centos\centos-6	4 xi\CentOS-6.4-x8	_		Browse
D:\centos\centos-6	4 xi\CentOS-6.4-x80	_		Browse
D:\centos\centos-6	4 xi\CentOS-6.4-x80	a blank h		Browse

Figure.3.30: Screenshot create a virtual machine.

Here many kinds of OS however we pick Linux then model click on Cent OS 64-bit due to the fact of this version. Figure (3.31)

Step 3: Select>Linux>version>next

Select a Guest Operating System Which operating system will be installed on this virtual machine? Guest operating system Microsoft Windows © Linux Novell NetWare Solaris O VMware ESX O other Version CentOS 64-bit	×	New Virtual Machine Wizard
Which operating system will be installed on this virtual machine? Guest operating system Microsoft Windows Ulinux Novell NetWare Solaris VMware ESX Other Version		Select a Guest Operating S
Microsoft Windows	iis virtual machine?	
© Linux Novell NetWare Solaris VMware ESX Other Version		Guest operating system
O Novell NetWare Solaris VMware ESX O ther Version		O Microsoft Windows
Solaris VMware ESX Other Version		Linux
O VMware ESX O Other Version		O Novell NetWare
O other Version		◯ Solaris
Version		O VMware ESX
		Other
CentOS 64-bit ~		Version
	~	CentOS 64-bit
Help < Back Next > Cancel	Next > Cancel	Help

Figure. 3.31: Screenshot select Linux and CentOS 64bit

Any name select than location choose than Next. Figure (3.32)

Step 4: Select name> location> next

rtual machine name:		
CentOS 64-bit (2)]
cation:		
:\Users\DOL\Documents\V	irtual Machines\CentOS 64-bit (2)	Browse

Figure. 3.32: Screenshot name and Location set up.

Customize hardware later because I pick out hardware that I want and finish. Installed Linux in virtual box Figure (3.33)

Step 5: select > finish

Name:	will be created with the following settings:	
Location:	CentOS 64-bit (2) C:\Users\DOL\Documents\Virtual Machines\CentOS 6	1
Version:	Workstation 10.0	
Operating System:		
Hard Disk:	20 GB, Split	
Memory:	1024 MB	
Network Adapter:	NAT	
Other Devices:	CD/DVD, USB Controller, Printer, Sound Card	~

Figure. 3.33: Screenshot customize hardware.

3.17 Challenges

The challenges in the area of engineering are extraordinary weapons, if we are looking in the engineering sector, we need apprehend shrewd knowledge. But after 4 months of internship journey and sharing of friends, after listening completely joyful times I had the intern has found that there are some prevalent challenges. I assume its intern three Things are: unpaid / under, transient and they are in the strolling reap experience. Sometimes It's not Enough: I'm no longer assigned enough work. I'm bored Squeezing, jerking my finger on my desk and prompting Facebook and LinkedIn to recognize it. Excessive work: Since interns are only completely satisfied to get a foot in the door, some offices can even gain youthful employees via imparting fewer hours of meaningless repetitive work.

CHAPTER 4

COMPETENCIES AND SMART PLAN

4.1 Competencies Earned

The end result in obtaining or analyzing a opposition is to make sure what an apprentice expects As a result of the find out about process, be in a position to know, be arrested or do. Install and Dissociation of every community and server laptop into two document views. In the lead function Linux software program implementations, for example, have been linked to LDAPHA Studying application outcomes, topics, and internship evaluations. Collecting and Organizing Information on Internship Project Details: Participate in a redesign Linux Lab Internet site.

Learning Outcomes: Install and configure software applications and enhancements Install, configure, and take a look at Network Employer Services Additionally, regularly find out about results, the internship on-site supervisor will grant a direction Related to organizational policies and procedures.

4.2SmartPlan

Each organization must have a smart diagram to achieve success. Basically, the idea of mixing something frequently creates a smart plan.

4.3 Reflections

An intern to gain practical experience in the engineering discipline. It helps Increase your journey in engineering jobs. In the Intern Period, I understand the Linux server. Linux One of the most popular working devices of the day. I'm on Linux and Security measures. This experience helps me become a strong applicant in the job market.

CHAPTER 5 CONCLUSION AND FUTURE CAREER

5.1 Discussion and Conclusion

In modern age of science and information technology, which is necessary for Improving a greater high-quality operation and administration process. In order to better serve customers, businesses want to be trained in many areas decrease time, accelerate new enterprise strategies, enhance client offering and expand skills sharing and learning. IT is basic but effective useful resource for implementing all these goals. Internships are nothing but a step forward in expert life. An internship is a bridge between theoretical data and practical knowledge. During the internship period, a variety of realistic experiences were gathered while performing tasks at one point. During the internship period, there are many obstacles. Which would have been a part-time experience for me? Three months of completing which I labored for Variations. I did my satisfactory to get accustomed to the corporate surrounding and attain every goal and every goal.

5.2 Scope for Further Career

I have been capable have a simple Linux server, but in the future, without the difficulty of securing a secure large Linux configuration, I want a large Linux server such as a data center to be able to continue and how to test a Linux server safely. I attempt to my best to analyze these for my great future. Career opportunities are accessible in various fields below Linux. The business potential in Linux is just bringing the Linux platform forward.

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[1] About 4K Engineering << <u>http://www.4kengineering.com/people.html</u> >>(Last visit on 2nd November 2019, 9.00 pm).

[2] Learn about Mikro-tik<<<u>https://systemzone.net/mikrotik-router-basic-configuration-using-winbox/</u>>>(Last visit on 5thOctober 2019 2.00 pm)

[3] Know about Cisco switch <<u>https://www.cisco.com/c/en/us/training-events/training-</u> certifications/certifications/associate/ccna-routing-switching.html> (Last visit on 15th October 2019 11.00 am).

[4] Concept the PPPoE<<u>https://wiki.mikrotik.com/wiki/Pppoe_server_with_profiles</u>>(Last visit on 15th October 2019 9.00pm).

[5] Get concept the DNS Server <<u>https://www.unixmen.com/setting-dns-server-centos-7/</u>>(Last visit on 17th October 2019 3.00 pm)

[6] About the cambium network <<u>http://community.cambiumnetworks.com/t5/ePMP-Configuration-</u> <u>Management/How-to-create-Templates-in-cnMaestro-for-ePMP-radio/td-p/109119</u>>(Last visit on 20th October 2019 6.00 pm)

[7] Help about IP address<<u>https://www.technobezz.com/how-to-find-your-router-ip-address/</u>>>(Last visit on 22th October 2019 7.00 pm)

[8] Learn about Linux <<u>https://www.linux.com/what-is-linux/</u>> Last visit on 25th October 2019 2.00 pm)

[09] Know about VM ware workstation <<u>https://en.wikipedia.org/wiki/VMware_Workstation</u>>>(last visit 30th October 2019 10.00 am)

[10] Know about Firewall <<u>https://www.interserver.net/tips/kb/add-ip-address-windows-firewall/</u>> (last visit 30th October 2019 12.30 pm)

[11] Know about ISP <<u>https://www.ntchosting.com/encyclopedia/internet/isp/</u>> (last visit 26th November 2019 7.00pm)

[12] Know about DHCP <<u>https://en.wikipedia.org/wiki/Dynamic_Host_Configuration_Protocol</u>> (last visit 27th November 2019 9.00pm)