

DAFFODIL INTERNATIONAL UNIVERSITY DHAKA, BANGLADESH MAY 2019

INTERNSHIP ON ISP SERVER CONFIGURATION ON LINUX, MIKROTIK ,CISCO SWITCH, Wi-Fi PLATFORM & CAMBIUM NETWORKS

SUBMITTED

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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This internship titled "ISP SERVER CONFIGURATION ON LINUX, MIKROTIK, CISCO SWITCH, Wi-Fi PLATFORM & CAMBIUM NETWORKS", submitted by Mst. Tafhima Sadika, ID No: 162-15-8112 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 has been held on 4 May 2019.

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I declare that, this internship report is prepared by me, Name: Mst Tafhima Sadika ID No: 162-15-8112 to the department of Computer Science and Engineering, Daffodil International University. Under the supervision of **Masud Rabbani Lecturer**, **Department of CSE**, Daffodil International University. I also declare that neither this internship report nor any part of this internship report has been submitted elsewhere for award of any Degree or Diploma. I also declare that, I collect information from Daffodil Online Limited (DOL), Books and Internet.

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ABSTRACT

As a student of CSE, I have completed my internship report in DOL. **ISP SERVER CONFIGURATION ON LINUX, MIKROTIK, CISCO SWITCH AND Wi-Fi PLATFORM& CAMBIUM NETWORKS**. The internship report is proposed for the completion of BSc in computer science & engineering. I develop myself to administration & security for that reason I chose DOL. Its give me the space to learn about Linux configuration, Cisco switch, NAT, Mikro-Tik, various types of sever, bandwidth management etc.Linux is free OS which is easily learn to security, sever ,command etc. Mikro-Tik is vary popular router in Bangladesh. We can do using Mikro-Tik router in static,DHCP,PPPoE configuration to step by step. In this report I can describe step of configure in details.

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CHAPTER 1

Introduction

1.1 Introduction

ISP server configuration of Linux and MkroTik platform, cisco switch, Wi-Fi router configuration & know about cambium networks this is the main goal of my internship program is to prepare myself as a skilled person in professional. So internship is very essential for me. I want to achieve quite special quality to prove myself. It covers advanced skills for the Linux professional that. This goal includes the ability to manage a running server and configuring. Linux with clear learning of services to be used. It covers basic skills for the Linux professional . Banking depend on sever system, ATM Technology (Switching Software), Banking Software, Debit Card, Credit Card, Online Transaction, international card . Every business and e-commerce today has much to do with software-based communication , internet technology is also a very useful server , by using this system we can operate various types of services.

1.2 Motivation

I am now continue my study in Computer Science and Engineering in that case I realize that practical knowledge in our working life must be important. Textbook also has to make a living in the future.

At the time I have found to learn linux, mikro-tik router, Cisco switch, cambium natworks to develop myself in network sector to bring me better service. My strength generally understands the situation and solve it smartly & quickly.

1.3 Internship Objectives

Linux operating system is one open source operating system. Actually Linux operating system used for server configuration. Mikro-Tik router is OS of Mikro-tik router Board hardware. That's necessary features - route, firewall, bandwidth management, wireless access point, hotspot gateway, VPN server and more server, & also know Cisco. Coordinating work experience with academic training.

1.4 Introduction to the Company

DOL delight another popular ISP in Bangladesh. They are built in 2002. In this past year they client helping every time. They have own fiber optic server. They all time use latest version of technology and also upgrading the service. they have all are expert staff, strong professional management to survive any kind of problem. On the day of globalization, DOL will be conducting the most challenging and demanding IT professional course and training. Daffodil Online Limited (DOL) is one of the fastest ISP's in Bangladesh to connect everyone, anywhere, all the time to deliver highquality Information and Communication Technology (ICT) services at a reasonable price. DOL uses the latest technology and upgrade services wherever necessary with a very strong, certified and associated professional engineering and management team

1.5 Report Layout

Chapter (1) I represent objective of internship, Motivation of internship and Introduction to the company.

Chapter (2) I represent the methodology of my internship. information about. Also included about how did perform the internship works, about the company, what are the IT service offered in DOL and what are the roles of in jobs market of Linux, Cisco switch & wi-fi router.

Chapter (3) I represent about daily task and activities, Events and Activities and Challenges.

Chapter (4) I represent is capability gain, Smart Plan, Reflections.

Chapter (5) I represent Conclusion and Future Scope. I discuss Future Scopes and write conclusion.

CHAPTER 2 ORGANIZATION

2.1 About the Company

DOL delight another popular ISP in Bangladesh. They are the most skillful & earliest ISP organization with vary much helpful with client. They are proud to be achieved that their outlook and unformal promising is there future to develop this company. It is different types of IT provider and training center, and our outlook for an equally promising future is even more exciting. Accomplished, they're even more excited about their future prospects

They are built in 2002. In this past year they client helping every time. They have own fiber optic server. They all time use latest version of technology and also upgrading the service. they have all are expert staff, strong professional management to survive any kind of problem. Ref [1];

2.2 Product and Market Situation

DOL delight another popular ISP in Bangladesh. They are the most skillful & earliest ISP organization with vary much helpful with client. They are proud to be achived that there outlook and unformal promising is there future to develop this company. It is different types of IT provider and training center, and our outlook for an equally promising future is even more exciting. DOL also offers various IT and professional training service. Here the given below

• IT Services

- 1. ISP Setup, Administration and configuration with Linux.
- 2. ISP Setup, Administration and configuration with Mikro-tik.
- 3. Cisco Switch, wi-fi router configuration and cambium networks.
- 4. Red Hat Certified Security Specialist (RHCSS)

2.3 Target Group

DOL delight another popular ISP in Bangladesh. They are the most skillful & earliest ISP organization with vary much helpful with client. They are proud to be achived that there outlook and unformal promising is there future to develop this company. It is different types of IT provider and training center .

2.4 Strength weaknesses opportunities & Threats Analysis

This is the business approach in any kind of location to develop skill

- **Strengths:** Contact each other to solve problem, collect information also establish e-business.
- Weaknesses: Understand the market, understand the market which one is best .
- **Opportunities**: Some product are specific location need too much so there the option to chose product
- Threats: Change status , media coverage .

2.5 Organizational Structure

Here the Organizational structure of Daffodil Online Limited in fig 2.1: Ref [1];

Chairman
Managing Director
General Manager
СЕО
Manager
Deputy Manager
Sr. Assistance Manager
Assistance Manager
Senior Officer
Officer
Officer Staff

Figure 2.1: Organizational Structure of DOL.

CHAPTER 3

Tasks, Events and Activities

3.1 Daily Tasks and Activities

Month - 1: I have learned and observed the following tasks during the 1st month of internee on DOL:

- Study about Network peripheral of Network and ip .
- Study basics concept of router.
- Discuss different types router.
- Know about IP address
- Routing configuration and how router works.
- Know about Mikro-Tik router.
- Static routing configuration.
- Dynamic routing configuration.

Month - 2: I have learned and observed the following tasks during the 2^{nd} month of internee on DOL:

- Essential routing.
- PPPoE configuration.
- NTP configure.
- Local ISP configuration.
- Maintenance routing protocols.
- WI-FI configure.
- Bridge mood configure.

Month – **3:** I have learned and observed the following tasks during the 3^{rd} month of internee on DOL:

- Cisco switch & router configuration
- Network cabling system
- Routing protocols.
- IPV6 basic and configuration.
- Know about cambium networks.

Month – **4:** I have learned and observed the following tasks during the 4^{th} month of internee on DOL :

- Linux addition & Installation.
- Modify the partition.
- Know about mounting and RPM.
- Learn RAID, LVM, Boot and Grub level
- Linux system administration
- Know about FTP, NFS, WEB, Samba, DHCP, DNS server.
- NIS configuration
- Securing with Iptables .
- Learn Syslog server
- Automate and Schedule system administration tasks.
- Enterprise Linux server monitoring (cacti, squint, Wireshark, MRTG)

3.2 Events and Activities

- Control PC & computer system.
- Set up user & password.
- Correction servers and routers.
- Correction LAN and switches.
- Professional in networking problem.
- High teach in networking support.
- Everyday admin will take care using data passing
- Easily Store data in Cambium device using cloud.

3.3 Project Task and Activities

Network:

A network is a combination of computers, servers network device many other peripherals device which is connected each other to sharing the information or data etc.

Networks are five types:

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

ISP: An internet service provider (ISP) is a system that provides many types of internet access ,use or assistance service .Internet service providers can be organized in different forms such as commercial ,community owned ,non profit, or otherwise private 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 installed on a computer with all basic feathers to route firewall, IP address gateway DNS server ,PPPoE server etc.

Router: A router is a network device which is forward data to computer. Router operate the traffic directing function on the internet.

Wi-fi: Wi-Fi is the wireless network technology which uses radio waves to operate high speed internet and network connection.

IP Address: IP address which is internet protocol address. Network use the IP address which is assign on protocol to communicate and help to data passing.

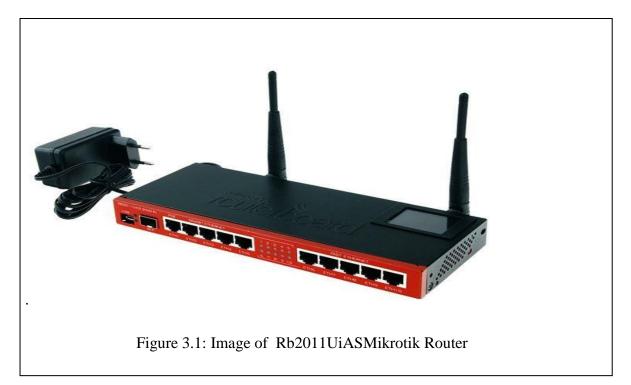
Function: IP address has two function that call host and another is network.

3.4 MikroTik Router

Mikro-Tik hardware which is basically use for router. It is so much reasonable price to other router which is various type of uses . In any company take bandwidth in main router than it given by other mikro-tik router. Its using in LAN, switch hotspot etc for the user to data sharing.

Mikrotik Router Rb2011UiAS:

Mikrotik Router Rb2011UiAS has most feathers and interface from all our wireless router .It has 600MHz 70K network processor.128mb RAM,SFP cage , 5 GB LAN ports and Ethernet ports. 2,4Ghz 802.11 wireless.RJ45 serial ports and micro USB port.It is alsp desktop enclosure, two indoor antennas for wireless power sully and touch screen LCD panel in Fig (3.1)Ref [2];



3.5 Router OS

The Mikro-tik is an OS which is used for router. Any company use it for router because of its cost reachable It at the same time connect 10 pc in one IP address. It can also using bridge ,firewall, DHCP also using hotspot . It connect with switch ,data passing to client very smoothly.

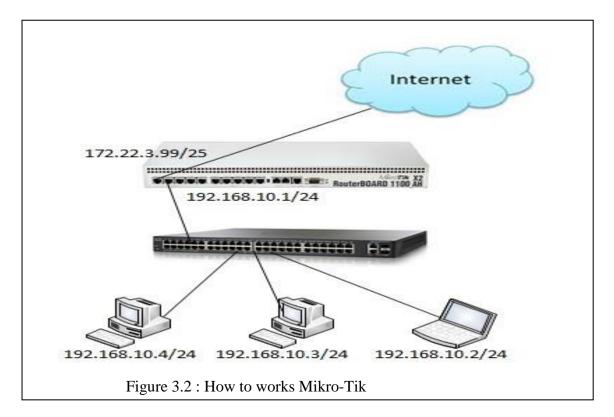
3.6 Features

Router OS base many apps ISP use. Here the object

- It using like a router.
- Using bridge or switch .
- Bring a client –server PPPoE.
- Bring VPN.
- Bring the rules for the Firewall.
- Bring service DHCP Server.
- Bring hotspot system based on wi-fi & captive portals.
- Managing bandwidth is very easy.
- Interface with easy GUI.
- Easy management.

3.7 How to be a MikroTik Configuration:

Mikro-Tik use three layer which is physical layer,data link layer,network layer.when Mikro-Tik install than we use winbox to set up ip address ,gateway, DNS,NAT,bridg, firewall etc .Here are three types of routing there is static,DHCP, PPPoE.Mikro-Tik router using fast and simple GUI in Fig (3.2)



3.8 Mikro-TIk Router Configuration :

Mikro-tik Router OS Installed.Winbox Software installed.PC with windows operating system installed and RJ45 cables.Than rest Mikro-tik router in Fig (3.3)Ref [4].

Step 1:

Ping> system reset-configuration> Enter.

Terminal							
MMM MMM MMMM MMMM	KKK			TTTTTTTTTTT TTTTTTTTTT	7	KKK KKK	•
MMM MMMM MMM	III KKK I	KKK RRRRRR	000000	TTT	III	KKK KKK	
MMM MM MMM	III KKKKK	RRR RRR	000 000	TTT	III	KKKKK	
MMM MMM	III KKK K	KK RRRRRR	000 000	TTT	III	KKK KKK	
MMM MMM	III KKK I	KKK RRR RRR	000000	TTT	III	KKK KKK	
MikroTik Rout	er05 6.43 (c) 1999-2018	http	://www.mikr	otik.d	com/	
[2]	Gives the :	list of avail	able comma	nds			
command [?]	Gives help	on the comma	nd and lis	t of argume	nts		
[Tab]		the command/w [ab] gives po			ambigu	ious,	
/	Move up to	base level					
••	Move up one	e level					
/command	Use command	d at the base	level				
DEVICE HACKED -	ACCOUNT add	nin HAD UNSAF	E PASSWORD)			
[admin@MikroTik] > system :	res					
resource reset	-configurat:	ion					
[admin@MikroTik] > system :	reset-configu	ration				
Dangerous! Rese	t anyway? [y/N]:					_

Figure 3.3: Screenshot Reset Mikro-Tik Router.

Add interface LAN & WAN . select IP to define the LAN & WAN in Fig (3.4) Ref [7]

Step 2:

IP>add ip.apply>ok

Define IP Setting up process. Process: IP click + IP address + (plus sign click) + add IP + apply ok

Interface -	<ether1></ether1>	90		- 1993		305	
General	Ethemet	Loop I	ок				
		Name:	ether1	WAN		Cancel	
		Type:	Apply				
			1500				Disable
		I MTU:					Comment
		2 MTU:					Torch
		2 MTU:			Cable Test		
	MAC A			:6D:D8:26:F	Blink		
		ARP:	enable	ed		Reset MAC Address	
	ARP I	imeout:					Reset Counters
enabled		runi	ning		slave		link ok

Figure 3.4: Screenshot interface Setting.

IP address select class B for LAN and WAN address select which is define easily.Fig (3.5)

```
Step 3:
```

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

Address <1			
Address:	172.16.1.1/24		OK
Network:	172.16.1.0	•	Cancel
Interface:	ether5 LAN	₹	Apply
			Disable
			Comment
			Сору
			Remove
enabled			

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

PC IP remove and select ip address , gateway , DNS server etc . and than apply to IP address . Fig $(3.6)\,Ref\,[5]$

Step 4:

IP>DNS IP>apply>ok

← Settings	Network and Sharing Center		- 0	×		
Chattan		> Network v ඊ	Search Control Panel	0		
🌣 Status		Network Connections		- 0	×	
Diagnose and fix network pr	Control Panel Home	← → ∽ ↑ 👰 « Ne				
View your network properties	Change adapter settings		Ethernet Status	Ethernet Properties	×	
	Change advanced sharing settings	Organize 👻 Disable thi	General	Networking Sharing	Internet Protocol Version 4 (TCP/IPv4) Prop	perties
Windows Firewall	secongs	Broadband Disconnect	Connection	Connect using:		
Network and Sharing Center		WAN Minit	IPv4 Connectivity:	Realtek PCIe FE Family Controller	General Alternate Configuration	
Network reset		Ethernet 2	IPv6 Connectivity: Media State:		 You can get IP settings assigned automatical this capability. Otherwise, you need to ask y for the appropriate IP settings. 	
Network reset		Unidentifie VMware Vit		This connection uses the following items:		
			Speed:	Client for Microsoft Networks	Obtain an IP address automatically Use the following IP address:	
lave a question?			Details	🗹 🖳 File and Printer Sharing for Micro	IP address:	
Get help				QoS Packet Scheduler Image: Scheduler Image: Scheduler		
			Activity	Microsoft Network Adapter Multi Microsoft LLDP Protocol Driver		
Make Windows better			Ser	<		
Give us feedback			Bytes: 1,5	Install Uninstall	 Obtain DNS server address automatical Ouse the following DNS server addresses 	
Dive us recuback	See also			Description Transmission Control Protocol/Internet		3 . 190 . 10 . 252
	HomeGroup		Properties 💡 D	wide area network protocol that provid across diverse interconnected network		3.190.10.253
Make Supout.if	Infrared					
Manual	Internet Options				Validate settings upon exit	Advanced
New WinBox	Windows Defender Firewall		l			OK Cancel
Exit						
		4 items 1 item selected			🖷 🕴 🛛 Activate Wind	
		4 items 1 item selected		8==		

Figure 3.6: Screenshot DNS set up

Firewall first setting is NAT setup than advance relect to pre-routing and than select action to masquerade in Fig (3.7)

Step 5:

IAT Rule <>	
Advanced Extra Action Statistics	ОК
Action: masquerade	Cancel
🗌 Log	Apply
Log Prefix:	Disable
To Ports:	Comment
	Сору
	Remove
	Reset Counters
	Reset All Counters

IP>firewall>NAT>action>masquerade>apply>ok

Figure 3.7 : Screenshot Firewall NAT

After gateway set up the process is assign.Fig (3.8)

Step 6:

ssion	Settings Das	shboard																			
0	Safe Mode	Session: 172.16.1.1																			
治 0	uick Set																				
ĩ C	APsMAN																				
)es h	terfaces																				
-	lireless																				
36 B																					
et Pi																					
m S																				•	
°IS M			Fire							_											
∰ P			R	er Rule	s NAT	Mangle	Raw	Senio	ce Ports	Connec	tions A	ddress Lists	Layer7 Pro	tocols							
@ M			+	-	1	۵ ا	T	00 R	Reset Cou	nters	oo Res	et All Counter	3					al	Ŧ		
😹 R 🛞 S			=			Chain	Sr	c. Addre	ess Dst.	Address	Proto	Src. Port	Dst. Port	In. Inter	Out. Int.	Bytes 1156	Packe		•		
()) () ()	yacom -		-			forward forward	17	2.16.1.2	254							1667.6 K		19 9 139			
R				2	K drop	forward	17	2.16.1.0	0/							41.8 K	iB	174			
E La																					
A R																					
× To																					
	ew Terminal																				
EL																					
M	etaROUTER																				
6 Pi	atition																				
N	ake Supout.rf		24	/1	elected																
e M	anual		31	ems (1	selected)		_	_			_							_	_		
🔘 N	ew WinBox																				
🤤 M 🎯 N 🛃 E	đ																				

Figure 3.8: Screenshot Gateway IP Assign.

Now create bridge which is connect two or many other pc in only one ip address which easily share data passing in same network .Fig (3.9)Ref [9]; *Step 7:*

Process:

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

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

DHCP Server							
DHCP Networks	Leases	Options Op	tion Sets	Alerts			
+ - 🖉 🖇	8 7	DHCP Confi	ig DHC	P Setup			Find
Name	/ Interfa	асе	Relay	Lease Time	Address Pool	Add AR	
dhcp1	bridge	e1		00:1	0:00 dhcp_pool1	no	

Figure 3.9: Screenshot Bridge

Create ports to show the two bridge.Fig (3.10)

Step 8:

Bridge>ports>add>ip adress >apply>ok

Bridge	Ports	VLANs	MSTIs	Port MST O	verrides Filt	ers NAT	Hosts M	DB		
• =			• 7	•						
#	Inter	face	Br	idge	Horizon	Trusted	Priority (h	Path Cost	Role	Root Pat
0 H	11e	ther5 LAN	V bri	dge1		yes	80	10	designated port	
1 IH	110	ther6	bri	dge1		yes	80	10	disabled port	

Figure 3.10: Screenshot Create Two Bridge

Define Mangle Option to help queue to select source adress & destination address.Fig (3.11)

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

New Mangle	e Rule	lew Mangle Rule							
General /	Advanced	Extra Action	Statistics		ок				
	Action	: mark connect	tion	₹	Cancel				
		Log			Apply				
	Log Prefix] ▼	Disable				
New Conn	ection Mark	: youtube		Ŧ	Comment				
		Passthroug	jh		Сору				
					Remove				
					Reset Counters				
					Reset All Counters				

Figure 3.11: Screenshot set up mangle option

To set up web browser ,rate, classifier & limit for how much to use data to select this one by 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 Rate:	· · · · · ·	bits/s	
Burst Threshold:		•	
Burst Time:	00:00:10		
Classifier:	Src. Address Dst. A Src. Port Dst. F	Address ² ort	
Src. Address Mask:	32		
Dst. Address Mask:	32		
Src. Address6 Mask:	64		
Dst. Address6 Mask:	64		

Figure 3.12: Screenshot Queue Settings

Here we show how much Mbps are uses on youtube browser .fig (3.13)

Step 11:

Define Upload and Download Rate

C* Safe Mode	Session: D4:CA:6D:	D8:26:FD								
Guick Set	Gueue List									E
CAPSMAN	Simple Queues Inte	aface Queues Queue	Tree Queue Types							
Interfaces		00 R	eset Counters 00 R	eset All Counters						nd
👔 Wireless	# Name	Target	Upload Max Limit	Download Max L	imit Packet Marks	Download	Total Max Limit (bi	.[
S Bridge	0 🗟 youtube	ip 10.10.10.0/24	5M	5M	youtube	0 bps			 	
PPP										
E Switch										
18 Mesh										
e IP ►										
🖉 MPLS 🛛 🗅										
🕏 Routing 🗈 🗅										
🕃 System 🗈										
Queues										
📄 Files										
Log										
🥵 Radius										
Tools 🕴 ۲										
New Terminal										
LCD										
MetaROUTER										
Partition										
Make Supout.if										
😝 Manual										
New WinBox										
Exit										

Fig 3.13: Screenshot Upload & Download rate .

3.9 PPPoE

PPPoE full meaning is point to point protocol over ethernet . It is antithetic profiles .It

is used mainly DSL service where user are use free in over to ethernet

3.10: PPPoE Configuration:

First we will configure interface that is connected to WAN. Than pc ip address delete & select which we select for PPPoE. Fig (3.14) Ref [4]

Step 1:

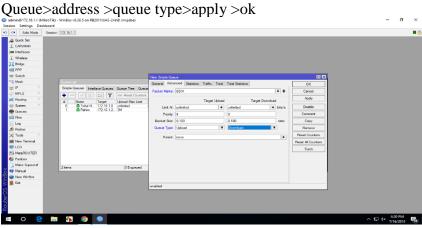


Figure 3.14: Screenshot PPPoE WAN set up

Now one interface is configured and connected to WAN. Now we will configure second interface for our local network in Fig (3.15) *Step 2:*

Ppp> PPPoE sever binding> add> profiles>apply>ok

sion Settings Dash	Session: 172.16.1.1										
	Jession. 172.10.1.1	_		_							-
CAPsMAN											
Im Interfaces											
1 Wireless											
Bridge											
💼 PPP											
🛫 Switch											
	PPP										
≝ IP ト	Interface PPPoE Servers Secrets	Profiles Active Conn	ections L2TP Secr	ets							
⊘ MPLS ト	+	PPP Scanner PP	TP Server SSTP	Server L2TP Server	OVPN Server	PPPoE Scan					Find
Routing	PPP Server	Actual M1	U L2 MTU Tx	Rx		Tx Packet (p/s)	Rx Packet (p/s)	FP Tx	FP Rx	FP Tx Packet (p/s)	FP Rx Pac
Ostem ►	PPP Client										
Queues	PPTP Server Binding										
Log	PPTP Client										
A Radius	SSTP Server Binding										
🗶 Tools 🗈	SSTP Client										
Mew Terminal	L2TP Server Binding L2TP Client										
🗐 LCD	OVPN Server Binding										
🛃 MetaROUTER	OVPN Client										
😓 Partition	PPPoE Server Binding										
Make Supout.rif	PPPoE Client										
😝 Manual											
New WinBox											
📕 Exit											

Figure 3.15: Screenshot PPPoE server Binding

Now we will create a profile that will be used by different users. Go to the main PPP window, go to Profiles tab, here you will see two profiles by default, don't do anything to these default profiles, create a new profile by pressing the PLUS sign.Fig (3.16)

Step 3 :

FTP>name>local address >apply >ok

Ca Safe Mode Session: 172.16.1.1						
Cuick Set						
CAP8MAN						
an Interfaces						
1 Wireless						
Bridge		New PPP Profile				
PPP		General Protocols Limits Q	eue Scripts	OK		
2 Switch		Name: 1M		Cancel		
12 Mesh PPP		Local Address: 192.168.1.	.	Apply		
Interface PPPoE Servers Secrets Profiles Active Connections MPLS Image: Secrets Profiles Active Connections	L2TP Secrets			порту		
		Remote Address: 1M	• •	Comment		Find
System	Rate Limit Only One default	Bridge:	•	Сору		
Queues	default	Bridge Port Priority:	•	Remove		
Files		Bridge Path Cost:	•			
Log						
& Radius		Incoming Filter:	-			
Tools		Outgoing Filter:	•			
Mew Terminal		Address List:	\$			
LCD						
MetaROUTER		DNS Server:	\$			
😓 Partition		WINS Server:	\$			
Make Supout if 2 items		- Change TCP MSS				
2 Manual		Cno Cyes i€ default				
S New WinBox		- Use UPnP C no C yes I default				
Ext						
	L				A	

Figure 3.16: Screenshot profile create

My PPPoE Server Setup is complete, however Internet right now will not be working at any cleint. Now we will setup NAT and ROUTE and DNS so that internet will also work on the clients. Fig (3.17)

Step 4:

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

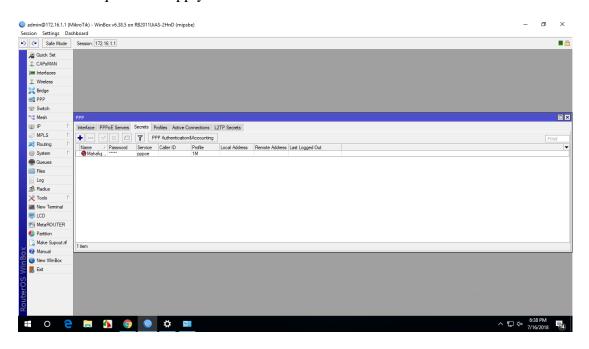


Figure 3.17: Screenshot PPP secrets to Password

Now the last step DNS server on Mikro-Tik router and provide by my ISP. Now our PPPoE server setup with profile and everything will worked .Fig (3.18)

Step 5: IP > DNS> settings > primary and secondary DNS Server's IP >apply >ok.

	metereo cor 🚆 Network and Sharing Center ×	
ind a setting	Chapterson A 12 of March 10 Construction of A	
twork & Internet	Show ← @ Connect to the Internet	
Status	Cha Type the information from your Internet service provider (ISP)	
Ethernet	User name mahafuj	
Dial-up	Password:	
VPN	Remember this password	
Data usage	og Connection name: Broudband Connection2	
Ргоху	Allow other people to use this connection This option allows anyone with access to this computer to use this connection. Loton there an EP	
	Winc Connect Cancel	
	Network an Infrared Internet Options Network res Windows Directed Frenzell	
		Go to Settings to activate Windows.

Figure 3.18: Screenshot Connect PPPoE.

3.11 Cambium Device: Cambium networks delivers strong, high conduct ,available wireless broadband also restore data and residentiary access application. Ref [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 change this mode. IP address give in AP mode which is given in Mikro-Tik.

Routing Mode : Routing mode define that I have choice to IP address and also change name & password .

3.13 How to configuration Cambium Networks in two types:

AP: Go to setting and change the IP address & subnet mask than we ping the IP address. Fig (3.19)

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

General		
	ned automatically if your network support ou need to ask your network administrator gs.	
Obtain an IP address au	Itomatically	
• Use the following IP add	dress:	
IP address:	192.168.0.2	
Subnet mask:	255 . 255 . 255 . 0	
Default gateway:		
Obtain DNS server addr	ess automatically	
• Use the following DNS s	erver addresses:	
Preferred DNS server:		
Alternate DNS server:		
Validate settings upon	exit Advanced.	•

Figure 3.19: Screenshot IP address set up

When ping IP address successful than ap route is configure in cambium networks. Fig (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 = 0ms, Maximum = 0ms, Average = 0ms

Figure 3.20: Screenshot ping Network address

Cambium network log in page we log in by admin and password and then sign in Fig (3.21)

Step 3: admin>password>sign in

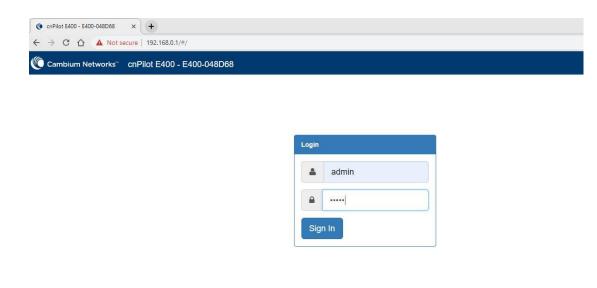


Figure 3.21: Screenshot log in page

Define how much client and channel connect. And rate ,limit also see this page .Fig (3.22)

Step 4: Process: sign in >ok

CnPilot E400 - E400-048D68	× (+				- 0
\leftrightarrow \rightarrow C \triangle A Not see	cure 192.168.0.1/#/home-view				아 ☆ Ө
Cambium Networks	cnPilot E400 - E400-048D68	в			🖒 Reboot 🛛 🖨 Logo
<u>III</u> Dashboard	Please configur	re the Country of operation under Configure->Syste	m		
🔀 Monitor 👻	Home / Dashboard				Refresh 30sec -
🌣 Configure 👻	Clients O	Channel auto 2.4GHz auto 5GHz	Ethernet 100M ETH1	RF	Quality 2.4GHz 5GHz
Operations					
	Access Point Info		Radio Info		
F 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. Fig (3.23)

Step 5 :

Name>placement >indoor>password>save.

	where the AP is installed.		
8 Monitor 🗸	Configure / System		
🌣 Configure 👻	System		
🖵 System	Name	sadika	Hostname of the device (max 64 characters)
9 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	Other	For appropriate regulatory configuration
Services	Placement	Indoor Outdoor Configure Whether the device LEDs sh	
• Operations	LLDP	Whether the AP should trans	mit 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 CLL

Figure 3.23: Screenshot system configure

VLAN set up in static than set up IP address DNS server than save .Fig (3.24) *Step 6:*

Network >Static IP>Network mask>DNS server 1 >save
--

Radio	Edit	VLAN 1 T	Delete this interface			Add new L3 Interfac
🗣 WLAN		IP Address	DHCP Static IP	Network Mask		
▲ Network			10.10.10.24	255.255.255.	D	
		NAT	When NAT is enabled, IP addresses u	nder this SVI are hidden		
Services		Zeroconf IP	Support 169.254 x x local IP address			
Operations		Management Access	Allow from both Wired & Wireless	٣	CL//GU//SNMP access via this interface	
2 Operations	DHCP Relay Agent		2005/2005/2005		Enables relay agent and assign DHCP server to it	
F Troubleshoot -		DHCP Option 82 Circuit ID	None	Ŧ		
		DHCP Option 82 Remote ID	None	Ŧ		
		Request Option All	Use Gateway, DNS, Dhop options rece	eived on this interface		
	Routing & D	NS				
		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 SSID & passphrese set than Ap mode is full set up than we can brower in internet.Fig (3.25)

Step 7: Basic >SSID>Passphrase>save .

	t secure 10.10.10.24/#/home-view/configure-wlan		୦ - ପ୍
¢ Configure -	Add WLAN		
System	wlan 1 [No SSID]		
* Radio			
🗢 WLAN	Basic Radius Server Guest Access Usage Limi	ts Scheduled Access Access Passpoint	
A Network	- Basic		
Services	Enable	×	
	Mesh	Off	Mesh Base/Client/Recovery mode
	SSID	sadika	The SSID of this WLAN (upto 32 characters)
F Troubleshoot -	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	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	cnMeestro
	Hide SSID	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)

Figure 3.25 : Screenshot edit WLAN

Routing mode :

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

Step 1:

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

Not secure 10.10.10.24/#/home-view/configure-ne	· · · · · · · · · · · · · · · · · · ·		* * *	Q \$
Configure / Network				
VLAN Routes Ethernet Ports Security DHCP 1	funnel PPPoE VLAN Pool			
VLAN				
Edit VLAN 100 V	Delete this interface			Add new L3 Interface
IP Address	O DHCP Static IP	Network Mask		
NAT				
Management Access	Allow from both Wired & Wireless	٣	CLI/GUI/SMMP access via this interface	
DHCP Relay Agent	0.0.0.0		Enables relay agent and assign DHCP server to it	
DHCP Option 82 Circuit ID	None	۲		
DHCP Option 82 Remote ID	None	٣		
Request Option All	Use Gateway, DNS, Dhop options received on this interface.			
Routing & DNS				
Default Gateway			IP address of default galeway	
Domain Name	10.10.10.1		Domain name	
DNS Server 1	203 190.10.262		Primary Domain Name Server	
2	203.190.10.263		Secondary Domain Name Server	
DNS Proxy	DNS Proxy			
	VLN Routes Ethemet Plants Security DHCP 1 VLN Efficient (VLA) 100 P Address IP Address DHCP Relay Agent DHCP Option 12 Circuit D DHCP Option 1	VLAX Routes Ethermat Ports Security DHCP Tunnel PPR-B VLAN Fool VLAN Edit VLAN 100 • Discrete fibe insoftnore IP Address • DhCP • Bate IP 101:00 000 • • DhCP • Bate IP 101:00 000 • • DhCP • Bate IP 101:00 000 • • DhCP • Bate IP • • Bate IP Bate I	VLAN Routes Eteremet Ports Security DHCP Tunnel PPRE VLAN Pool VLAN Edit VLAN 100	VLAX Route: Etermest Plots: Social: PP-05 VLAN Root VLAN Image: Control of the control of t

Fig 3.26: Screenshot routing mode configure.

Network icon to set up DHCP,Address range what is limit to browse and DNS sever.Fig (3.27)

Step 2:

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

i Dashboard								Success	×				
Monitor -	Configure	2 / Network						pool 1 Configu	ration Saved				
Configure -	VLAN	Routes	Ethernet Ports	Security	DHCP	Tunnel	PPPoE	VLAN Pool					
) System		Edit	pool 1		¥	Delete	this Pool					5	Create P
Radio				Add	ress Range	192.1	58.0.2		192.188.0.254	IP address range to be assign	ned to clients		
VLAN				Det	fault Router	192.1	88.0.1		Defeut router /P				
Network				Do	main Name				Domain Name				
				D	NS Address	203.1	90.10.252		203.190.10.253	Domain name for the client			
Services					Network	192.1	58.0.0		255.255.255.0	Subnet number and mask of	the DHCP address pool		
Operations					Lease	1			Hours	Minutes	Lease time (days:hours:minutes)		

Figure 3.27: Screenshot DHCP set up

Here WLAN just edit to name and passphrese . And configure full routing mode . now browse smothly.Fig (3.28)

Step 3:

Process: WLAN > name > passphrese > save

	Not secure 10.10.10.24/#/home-view/configure	s mun	•• Q ☆
Configure -	Add WLAN	Success Basic Configuration Saved	. x
-	Edit WLAN		
9 System	sadika		
Radio			
P WLAN	Basic Radius Server Guest Access Usage Limits	Scheduled Access Access Passpoint	
Network	Basic		
Services	En	ible 🦉	
Operations		esh Off	▼ Mash Base/Client/Recovery mode
Operations	s	SID sadika	The SSID of this WLAN (upto 32 characters)
- Troubleshoot -	VI	AN 100	Default VLAN assigned to clients on this WLAN. (1-4094)
	Secu	wPA2 Pre-shared Keys	Set Authentication and encryption type
	Passphr	ase	WPA2 Pre-shared Security passphrase or key
	Rad	lios 2.4GHz and 5GHz	▼ Define radio types (2.4GHz, SGHz) on which this WLAN should be supported
	VLAN Poo	ling Disable	▼ Configure VLAN pooling
	Max Clie	ents 127	Default maximum Client assigned to this WLAN. (1-256)
	Client Isola	tion Disable	 When selected, it allows wireless clients connected to the same AP or different APs to communicate with each other in the same VLAV
	onMaestro Managed Roam	ing Enable centralized management of roaming for w	reless clients through on/laestro
	Hide S	SID Do not broadcast SSID in beacons	
	Session Time	out 28800	Session time in seconds (60 to 604800)
	Inactivity Time	out 1800	Inactivity time in seconds (60 to 28800)
	Drop Multicast Tra	effic Drop the send/receive of multicat traffic	

Figure 3.28: Screenshot WLAN set up

3.14 Cisco Switch:

A network switch is a computer network device that connects device to a computer network by using packet switching to receive, process and forward data to the device of destination. To configure a switch we have to know three basic modes. These modes also are the same for Router. Ref [3]; There are total 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 an operating system. An operating system is software that manages all of the hardware resources associated with our desktop or laptop. Ref[8];

The OS is comprised of a number of pieces:

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

Many benefit of Linux :

- The freedom to run the program, for any purpose.
- The freedom to study how the program works, and change it to make it do what I wish.
- The freedom to redistribute copies so I can help 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 image file" and browse to the Linux iso I downloaded.

Here we take two type of installation. We can take any other but I take typical, because it's easy to machine in as my prefers. Then next, Fig (3.29)

Step 1:

select typical>next



Figure 3.29: Screenshot Complete the VM virtual box installation

Here three types of system but I am guest that's why I easily use to OS, I will install the OS later. Than Next .Fig (3.30)

Step 2:

Select > I will install the os later >next

New Virtual Machine Wizard	×
Guest Operating System Installation A virtual machine is like a physical computer; it needs an operating system. How will you install the guest operating system?	3
Install from:	
O Installer disc:	
No drives available	
○ Installer disc image file (iso):	
D:\centos\centos-64 xi\CentOS-6.4-x86_64-bin-DVD1 V Bro)WSe
I will install the operating system later. The virtual machine will be created with a blank hard disk.	

Figure 3.30: Screenshot create a virtual machine .

Here many types of OS but we select Linux then version click CentOS 64-bit because of this version. Fig (3.31)

Step 3:

Select>linux>version>next

lew Virtual Machine Wizard			×
Select a Guest Operating	g System		
Which operating system	n will be installed or	n this virtual machine	e?
Guest operating system			
O Microsoft Windows			
Linux			
O Novell NetWare			
◯ Solaris			
O VMware ESX			
Other			
Version			
CentOS 64-bit			~
			1
Help	< Back	Next >	Cancel

Figure 3.31: Screenshot select Linux and CentOS 64bit .

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

Step 4: select name> location> next

Name the Virtual Machine		
What name would you like	e to use for this virtual machine?	
/irtual machine name:		
CentOS 64-bit (2)		
.ocation:		
C:\Users\DOL\Documents\Virtua	al Machines\CentOS 64-bit (2)	Browse
The default location can be chang	ged at Edit > Preferences.	
The default location can be chang	ged at Edit > Preferences.	

Figure 3.32 : Screenshot name and Location set up

Customize hardware Later because of I choose hardware what I want and finish. Installed Linux in virtual box Fig (3.33)

Step 5: select > finish .

	will be created with the following settings:	
Name: Location:	CentOS 64-bit (2)	~
	C:\Users\DOL\Documents\Virtual Machines\CentOS 6 Workstation 10.0	
Operating System:	Centos 64-bit	
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:

As a satisfying internee there are some issues to solve project but I can solve it in each learn. Use to simple conversation with other to solve adopting the work than expert will help me to solve the problem. Expand comparable scope with any client. Each are help to learn how to helpful in client to his problem. Last of all there are many challenges in internee all of raised to develop myself. If we holding the challenge positively than it solve so much easier.

CHAPTER 4

Capability Gain

4.1 Capability Gain

- Different types of network, their uses, identify & use basic Network components.
- Develop solutions for technical issue, networking & security problems.
- Install, configure, and troubleshoot client network operating systems.
- Install Linux based OS in server and system.
- Expert in command line-based system in Linux.
- Configuration of various servers like Web Server, FTP Server and Mail Server.
- Acquiring about computer network software, components of a network.
- Acquire to troubleshoot different server problems

4.2 Smart Plan

To be honest any types of company which have some unique procedure which is particular to other company.

4.3 Reflections

My work environment is bright and open form of communication. Employees of Daffodil Online are always keeping desired communication between them.

a) Work Life Balance

Daffodil Online Limited confers Work Life Balance. DOL confer me scale between personal life& work. It's having knowledge of balance will improve job conception.

b) Open Communication & Transparent

My work environment is transparent and open form of communication. Employees of DOL are always keeping desired communication between them. Office work becomes significant because the employee knows what they really avail sense gives for DOL. Daffodil Online Limited confer me transparent & open communication between employee and me.

- c) Development& Training
- d) Daffodil Online Limited confer me training & development expertness when change is more protrusive ever before, it's necessary for organizations keep along with changes and train employees.
- e) Strong Team Spirit

Teamwork for organization is the most important thing. His help find out how to talk about a problem together. It's an identity work and everyone is working for it. Everyone who works to achieve a lager goal works as a team I am learning strong team spirit from Daffodil Online Limited (DOL).

CHAPTER 5

Conclusion and Future Career

5.1 Discussion and Conclusion

Linux one of most popular and productive operating systems in the world. Its acceptance is product of the high and potential capacity that Linux offers to many different fields of work. This final chapter will be a summary of my internship where I will discuss the importance of the internship program run through the Operating Systems: Microsoft Windows NT/2000, Linux and UNIX. Linux in Universities" for more about this on that project, read or search through their past discussions, ask new four-year universities for an Open Source programming internship. The actual discussion was relatively unstructured, involving numerous for all practical purposes, an internship program on a massive scale. A resume is a summary of our experience, education, and skills. Its main events attended editorial meetings and internship program development training sessions. Analysis, Management of Extreme Financial Events, Game Theory UNIX, Linux, MSDOS, Windows 95/98/NT, and Macintosh. As an operating system, Linux is completely customizable, from the kernel to the GUI and beyond, which is not something that can be said. The most obvious choice at this point is to use Linux as the operating system. Generally, when people talk about 'Linux. The most popular end-user operating system is now Linux. Linux is becoming increasingly popular as the operating system for servers, gradually eating away at the market share of Windows NT.

5.2Scope for Further Career

Procedure happening to network site are available in Bangladesh because of our country has develop in network day by day. Easy and free OS in worldwide is Linux which is big opportunity of my work skill. Any develop of computer than we easily used Linux to develop apps, disclosed authority software etc. Many companies of Bangladesh they are shift in Linux to easily use software, network also data sharing. Many requirements for the ingenuity in Linux, Mikro-tik etc.

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[6] About the cambium network <<https://www.cambiumnetworks.com/why-cambium/ >> (Last accessed on 15th march 2019,at 7 pm)

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(Last accessed on 17th march 2019,at 10 pm)

[8] learn about Linux << https://www.linux.com/what-is-linux >>(Last accessed on 20th march 2019, at 9 pm)

[9] Concept the Bridge <<https://support.ispsupplies.com/hc/en-us/articles/115009794208-Bridge-Two-MikroTik-Devices >>(Last accessed 20th march 2019,at 10 pm)

[10] Know about VM ware workstation <<https://en.wikipedia.org/wiki/VMware_Workstation>>(last accessed 21th march 2019, at 7 pm)

[11] Know about Firewall <<https://www.interserver.net/tips/kb/add-ip-address-windows-firewall/>>(last accessed 21th march 2019, 10 pm)

Appendix A:

Internship Reflection

2. Enable Password Setup: DOL_LAB(config)#enable password 12345

3.Enable Secr. et Password Setup: DOL_LAB(config)#enable secret cisco123

**This password is recommended than 'enable password' because it is encrypted by default.

**To Encrypt system passwords, we have to execute this command: Switch(config)#service password-encryption

4.IP Address Assign to Interface & comment the Interface: DOL(config)#interface fastEthernet 0/0 DOL(config-if)#description To_Uplink DOL(config-if)#int DOL(config-if)#ip ad DOL(config-if)#ip address 192.168.50.1 255.255.255.0 DOL(config-if)#no sh DOL(config-if)#no shutdown

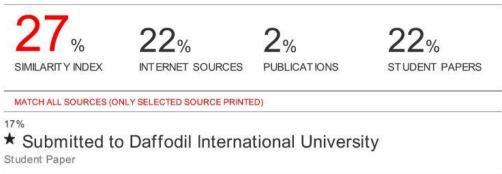
Appendix B: Office Element



	Head Office
Name	Daffodil Online Limited
Address	102, Shukrabad (3rd floor), Mirpur Road, Dhanmondi, Dhaka - 1207, Bangladesh
Telephone	02-9143258-60
Fax	880-2-8116103
E-mail	info@daffodilnet.com
Website	www.daffodilnet.com
Type of Organization	Nationwide Internet Service Provider (ISP)

INTERNSHIP ON ISP SERVER CONFIGURATION ON LINUX, MIKROTIK ,CISCO SWITCH, WI-FI PLATFORM & CAMBIUM NETWORKS

ORIGINALITY REPORT



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